SUPPLEMENTAL SAMPLING AND ANALYSIS REPORT

ALAMITOS BAY MARINA BASIN 1

Prepared for

City of Long Beach

Department of Parks, Recreation, and Marine

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Prepared by

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May 2009

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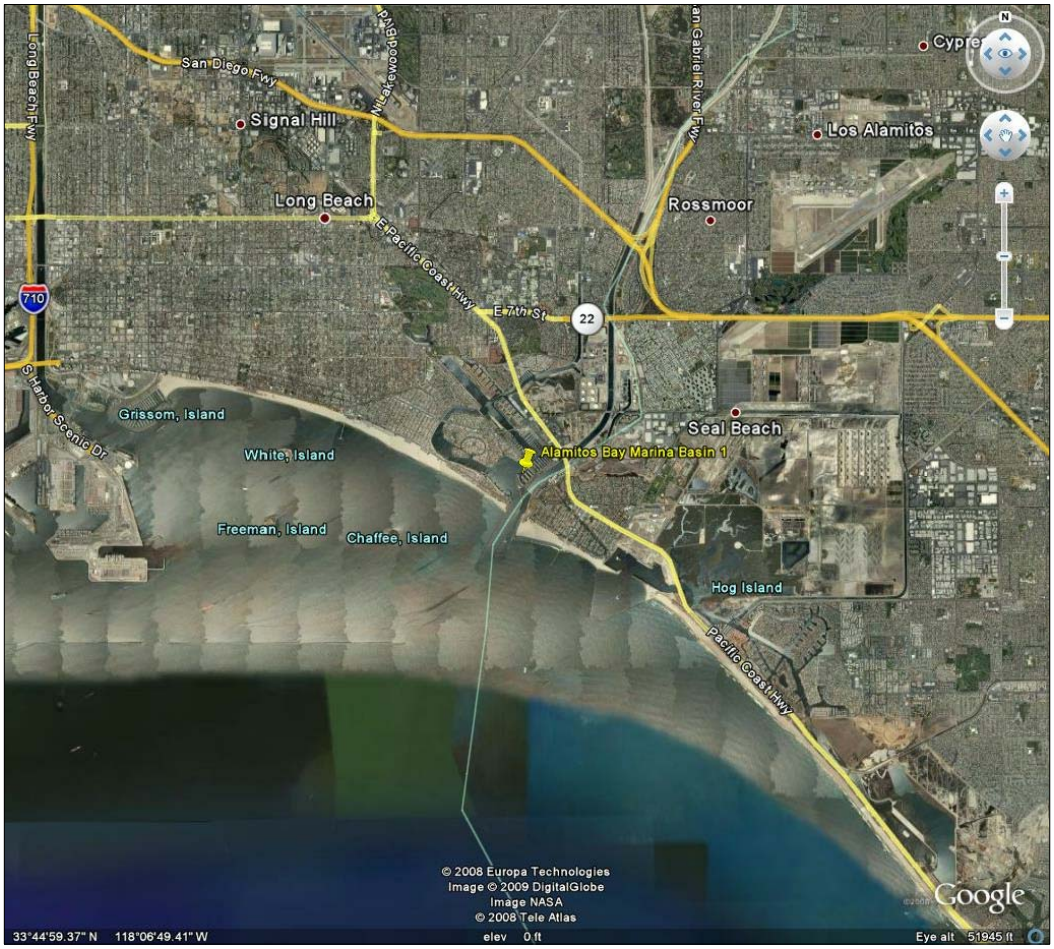
LIST OF ACRONYMS AND ABRREVIATIONS

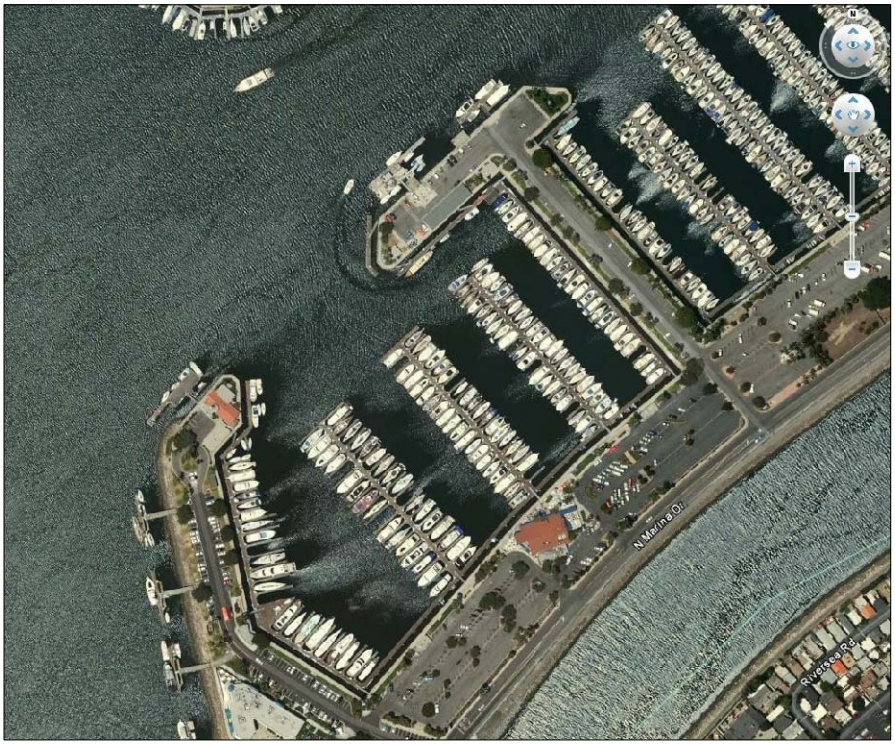
Calscience	Calscience Marine Analytical Laboratory
ERL	effects range low
ND	non-detect
QA	quality assurance
QC	quality control
SSAP	Supplemental Sampling and Analysis Plan
USEPA	U.S. Environmental Protection Agency
Weston	Weston Solutions, Inc.

1 INTRODUCTION

This document presents the results of the supplemental dredged material sampling and analysis field program for Basin 1 of the Alamitos Bay Marina, located in the City of Long Beach, California (Figure 1). Sampling and analysis was conducted pursuant to the approved Supplemental Sampling and Analysis Plan (SSAP) dated January 2009 (Anchor). The SSAP was prepared in response to agencies concerns regarding mercury distribution in Basin 1. Previous sampling and analysis results conducted by Weston Solutions, Inc. (Weston; 2007a and 2007b), in 2007 indicated acceptable Tier III test results, but some elevated concentrations of mercury were found in Basin 1. Subsequently, the agencies and the applicant agreed to pursue this supplemental sampling to further refine the horizontal and vertical extent of mercury within Basin 1. This document presents the results of that effort.

The general scope of work for this sampling effort included collecting physical and chemical data from twelve sediment core samples at discrete, 1-foot intervals to characterize the distribution of mercury in the proposed dredge cuts. The sampling locations are shown in Figure 2.





Apr 28, 2009 2:24pm cdavidson K:\Jobs\080548-Long Beach On-Call\080548-01 Alamitos Bay\080548801-RP-001.dwg FIG 1

Figure 1
Vicinity Map
Alamitos Bay Marina Basin 1

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ALAMITOS MARINA MAIN CHANNEL

Harbor Master

FUEL DOCK

1

2

3

4

5

6

7

BASIN 1

BASIN 1

Gangway

Gangway

Gangway

Crab Pot

Dredge to -15 ft. MLLW

Dredge to -12 ft. MLLW

⊙1

⊙2

⊙3

⊙4

⊙5

⊙6

⊙7

⊙8

⊙9

⊙10

⊙11

⊙12

B1-1
0.41 mg/kg

B1-2
0.28 mg/kg

B1-3
0.72 mg/kg

B1-4
1.07 mg/kg

B1-5
0.68 mg/kg

Bench Mark Gang 7 Chiseled X Top
Bulkhead Wall El= 9.46' MLLW

LEGEND:

⊙1 Proposed Sample Location and Number

Areas with Highest Contamination Potential

●B1-1 2007 Sampling Location and Number

0.41 mg/kg 2007 Mercury Concentration

Dredge Limit

0 100
Scale in Feet

HORIZONTAL DATUM: California State Plane, Zone 6 NAD83.
VERTICAL DATUM: Mean Lower Low Water (MLLW).

May 18, 2009 10:25am cdavidson K:\Jobs\080548-Long Beach On-Call\080548-01 Alamitos Bay\080548-01-RP-002.dwg FIG 2 (1)

ANCHOR QEA

Figure 2
Proposed Supplemental Sampling Locations
Alamitos Bay Marina Basin 1

2 REPORT ORGANIZATION

This report presents the results of the sampling and analysis program as described in the project SAP. This report is organized as follows:

- Section 1 – Introduction
- Section 2 – Report Organization
- Section 3 – Sediment Core Collection and Sample Processing
- Section 4 – Chemical and Physical Analyses
- Section 5 – Quality Assurance and Quality Control Summary
- Section 6 – Conclusions and Recommended Suitability Determinations
- Section 7 – References

Appendices provide supporting project documentation and are organized as follows:

- Appendix A – Field Recording Forms
- Appendix B – Laboratory Data Package

3 SEDIMENT CORE COLLECTION AND SAMPLE PROCESSING

This section summarizes the sediment sampling and processing activities conducted in connection with the characterization of marina sediments. Sampling and sample processing were carried out in accordance with the SSAP.

3.1 Summary of Sample Collection Activities

A total of 12 sediment core samples were extracted and subsampled at discrete intervals on February 19 and 20, 2009. Samples were collected by a barge-mounted vibro-core (pictured below). Core logs presented in Appendix A depict the locations of the discrete intervals relative to each core. Table 1 (below) presents the data by core and interval and includes a note reconciling this issue.

Photograph 1. Barge-mounted vibro-core.

Table 1
Sediment Core Recovery and Compositing Scheme

Station Sample ID	Water Depth (MLLW)	Penetration Depth (MLLW)	Core Recovery (feet)	Discrete Samples Collected
ABM-CS-1	-10.2	-15.2	3.1	01, 02 ,03
ABM-CS-2	-11.4	-15.5	4.0	01, 02, 03, 04
ABM-CS-3	-12.2	-17.2	5.0	01, 02, 03, 04, 05
ABM-CS-4	-10.5	-15.5	5.0	01, 02, 03, 04, 05
ABM-CS-5	-10.2	-15.2	5.0	01, 02, 03, 04, 05
ABM-CS-6	-12.0	-15.5	3.5	01, 02, 03, 04
ABM-CS-7	-11.0	-17.0	6.0	01, 02, 03, 04, 05, 06
ABM-CS-8	-12.6	-17.3	4.7	01, 02, 03, 04
ABM-CS-9	-11.8	-15.0	3.2	01, 02, 03
ABM-CS-10	-12.1	-14.1	2.0	01, 02
ABM-CS-11	-11.7	-13.7	2.0	01, 02
ABM-CS-12	-11.4	17.4	6.0	01, 02, 03, 04, 05, 06

3.2 Summary of Sample Processing Activities

Sediment cores were processed on shore, per the SSAP and regional guidance. Sample containers were filled, labeled, packed, and shipped to CalScience Marine Analytical Laboratory (CalScience) in Huntington Beach, California, for mercury analyses. Appropriate chain-of-custody procedures were followed.

3.3 Deviations from the Supplemental Sampling and Analysis Plan

Cored depths are all considered to adequately represent the dredge prism for sediment characterization. During sample processing, there were no deviations from the procedures detailed in the SAP.

4 CHEMICAL AND PHYSICAL ANALYSES

All discrete sediment samples were analyzed for mercury and grain size as described in the SSAP. Mercury was analyzed using U.S. Environmental Protection Agency (USEPA) method 7471A. Data for mercury and grain size by core and interval is presented in Table 2 below.

Table 2

Mercury and Grain Size by Core and Interval

Station ID	Interval	Top of Interval (feet MLLW)	Bottom of Interval (feet MLLW)	Mercury	Percent Fines
ABM-CS-1	1	-10.2	-11.2	0.0487	66
	2	-11.2	-12.2	0.242	72
	3	-12.2	-13.2	ND	16
ABM-CS-2	1	-11.4	-12.4	0.277	82
	2	-12.4	-14.4	0.324	72
	3	-13.4	-14	ND	63
	4	-14	-15.4	ND	31
ABM-CS-3	1	-12.2	-13.2	1.42	89
	2	-13.2	-14.2	0.131	31
	3	-14.2	-15.2	0.0363	26
	4	-15.2	-16.2	ND	20
	5	-16.2	-17.2	ND	36
ABM-CS-4	1	-10.5	-11.5	0.172	84
	2	-11.5	-12.5	1.44	83
	3	-12.5	-13.5	1.79	84
	4	-13.5	-14.5	1.03	90
	5	-14.5	-15.5	ND	43
ABM-CS-5	1	-10.2	-11.2	0.261	83
	2	-11.2	-12.2	0.658	82
	3	-12.2	-13.2	2.74	85
	4	-13.2	-14.2	0.0433	82
	5	-14.2	-15.2	0.0575	54
ABM-CS-6	1	-12	-13	0.387	83
	2	-13	-14	2.03	78
	3	-14	-15	2.38	76
	4	-15	-15.5	ND	54
ABM-CS-7	1	-11	-12	1.35	84
	2	-12	-13	2.22	67
	3	-13	-14	0.337	31
	4	-14	-15	ND	13
	5	-15	-16	ND	27
	6	-16	-17	ND	32

Table 2
Mercury and Grain Size by Core and Interval

Station ID	Interval	Top of Interval (feet MLLW)	Bottom of Interval (feet MLLW)	Mercury	Percent Fines
ABM-CS-8	1	-12.6	-13.6	1.66	85
	2	-13.6	-15.1	2.19	84
	3	-15.1	-16.6	0.0407	7
	4	-16.6	-17.3	ND	1
ABM-CS-9	1	-11.8	-12.8	0.692	88
	2	-12.8	-13.8	0,985	99
	3	-13.8	-15	1.83	91
ABM-CS-10	1	-12.1	-13.1	0.205	68
	2	-13.1	-14.1	ND	72
ABM-CS-11	1	-11.7	-12.7	0.183	74
	2	-12.7	-13.7	0.299	79
ABM-CS-12	1	-11.4	-12.4	0.199	76
	2	-12.4	-13.4	0.288	77
	3	-13.4	-14.4	0.458	76
	4	-14.4	-15.4	ND	83
	5	-15.4	-16.4	ND	83
	6	-16.4	-17.4	ND	81

Notes:
ND – non-detect

4.1 Visual Analysis of Cores in the Field

Visual inspection of cores in the field indicated that material is predominantly comprised of gray to dark gray silts overlaying, fine to silty sands containing some cobble and shell fragments. No obvious contaminant layers or sheens were observed. For detailed visual descriptions of each core please see Appendix A. Cores were also photo-logged in the field.

4.2 Results of Chemical and Physical Analyses

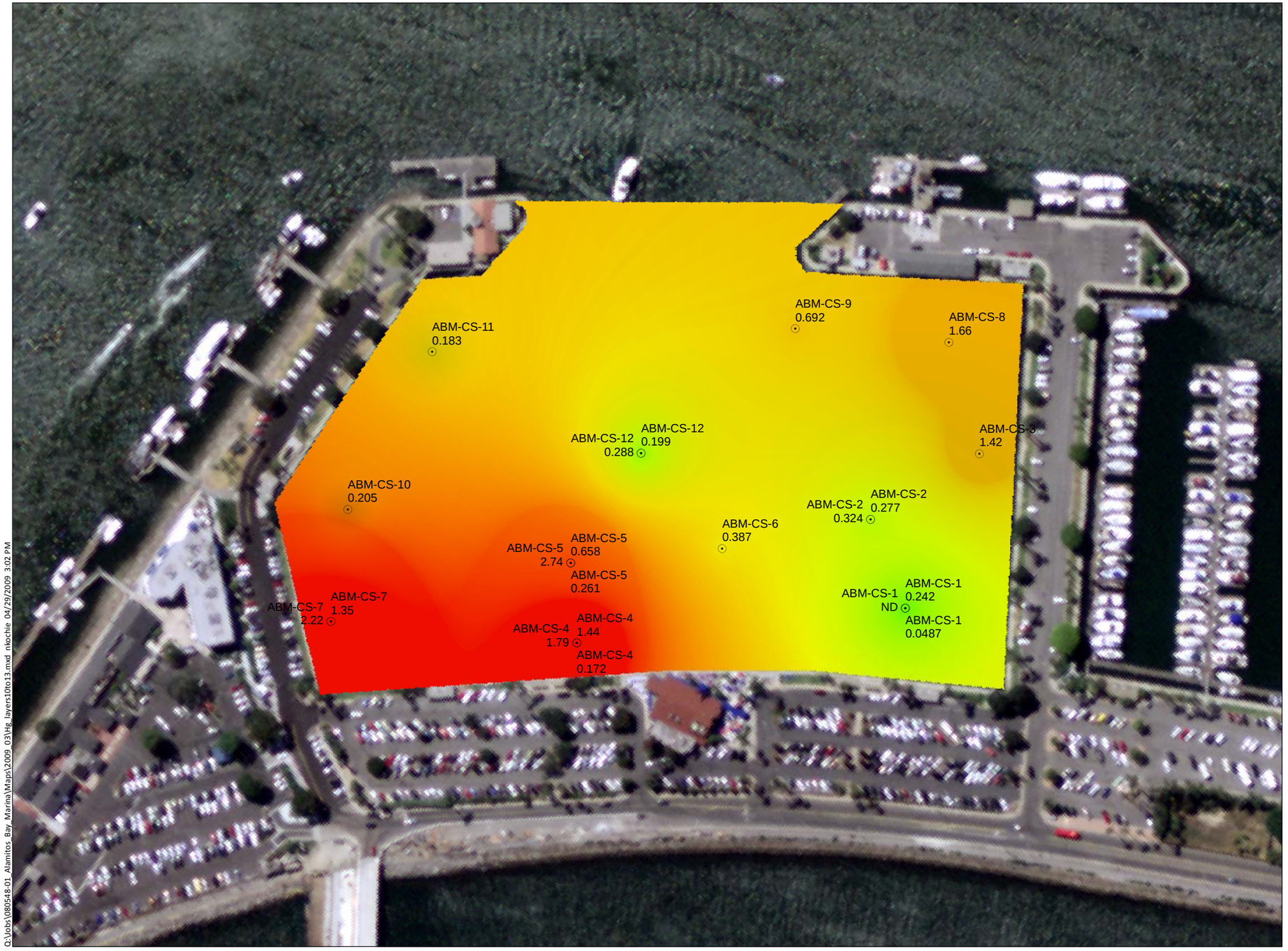
The results of the discrete interval analyses for mercury are depicted in Table 2 and on Figures 3 though 6. Mercury concentrations appeared highly dependent on grain size and location within the basin. The figures show a conservative weighted average interpretation of mercury concentrations throughout the basin, which are computed based on the point data contained in Table 2. Figure 3 shows the modeled mosaic of mercury concentrations from -10 to -13 feet MLLW. Figure 4 similarly shows the mercury concentrations below -13

feet MLLW. An evaluation of the overall area interpreted indicates that the "southeast" and "northwest" corners have low (effects range low [ERL] or below) mercury concentrations. These areas are shown in Figures 5 and 6, which were generated by isolating these "corner" areas and running the model on the concentrations within these boundaries.

An interpolation of mercury concentration related to grain size is shown in Figure 7. In general, unacceptable (e.g. higher than ERL) mercury concentrations occur predominantly in finer grained (e.g., silty) material above 60 percent fines.

The result of this program is that 33,738 cubic yards (cy) of material is requested for approval for disposal at LA-2 (including 2 feet of overdepth), and 25,504 cy (including 2 feet of overdepth) would be required to be disposed of in an approved confined location (e.g., an approved landfill, confined aquatic disposal [CAD], or upland confined disposal facility [CDF]).

These results were discussed with the agencies in a conference call format. The result of the call was agreement that the areas shown in Figures 5 and 6 were acceptable for ocean disposal, in combination with the previously completed Tier III analyses. Based on this call, the applicant's engineer created a dredge plan matching these results (Figure 8).



Sample Location

Mercury Concentration (ppm)

High : 2.59369

Low : 0.042564

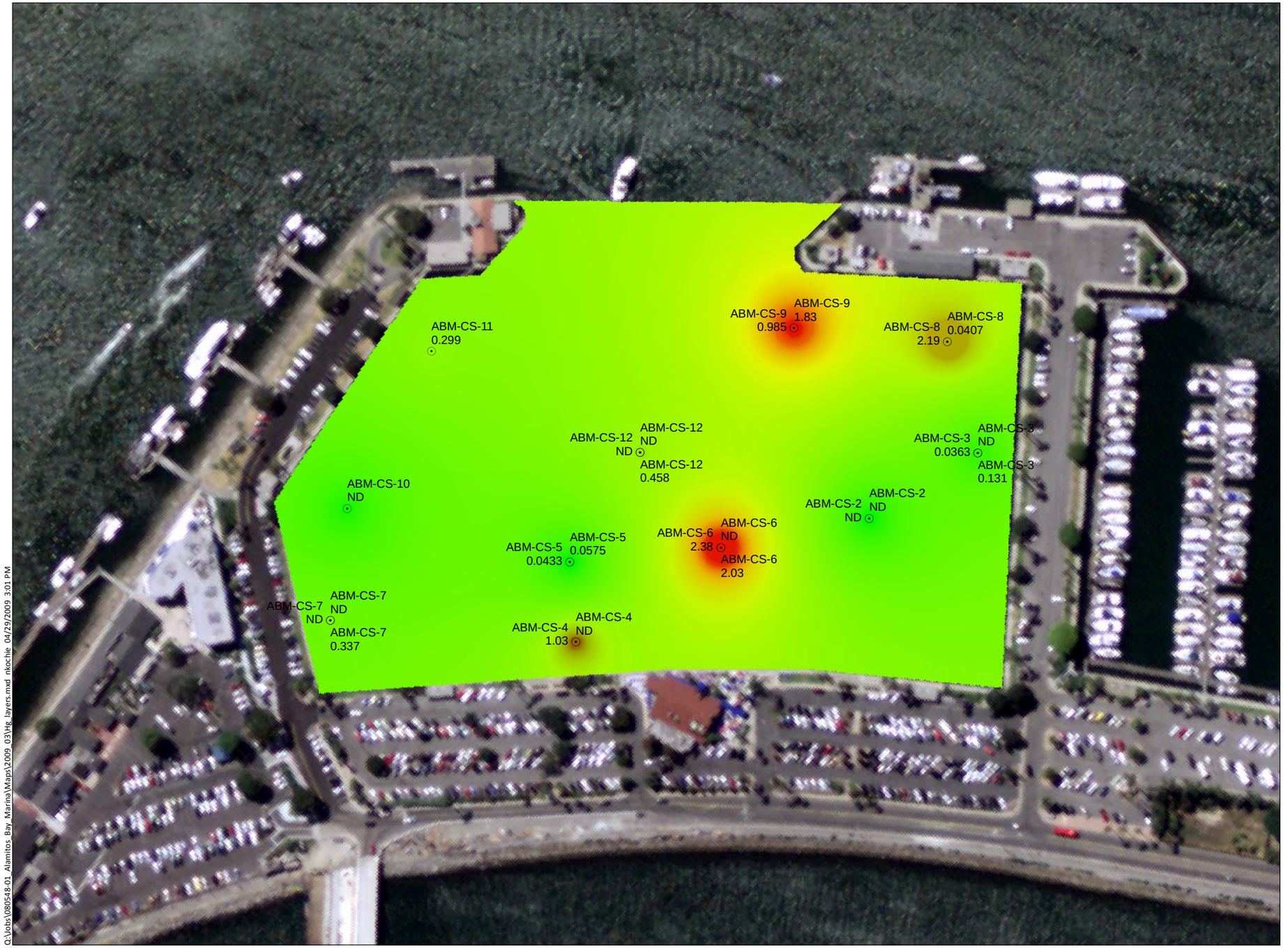
Note:
1. High and Low values from all interval depths.
2. Non-detect value calculated as 0.05 in IDW.

Feet
0 75 150

Q:\Jobs\080548-01_Alamitos_Bay_Marina\Maps\2009_03\Hg_layers10to13.mxd nkochie 04/29/2009 3:02 PM

ANCHOR QEA

Figure 3
Mercury Concentrations -10 to -13 feet MLLW
Alamitos Bay Marina Basin 1



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Sample Location

Mercury Concentration (ppm)

High : 2.59369

Low : 0.042564

Note:
1. High and Low values from all interval depths.
2. Non-detect value calculated as 0.05 in IDW.

Feet
0 75 150

Figure 4
Mercury Concentrations -13 to -16 feet MLLW
Alamitos Bay Marina Basin 1

ANCHOR QEA

Sample Location

Mercury Concentration (ppm)

High : 2.59369

Low : 0.042564

Note:
1. High and low values from all interval depths and all sample locations.
2. Non-detect value calculated as 0.05 in IDW.

Feet
0 75 150

Q:\Jobs\080548-01_Alamitos_Bay_Marina\Maps\2009_03\Hg_10to16_NWcorner.mxd nkochie 04/29/2009 2:59 PM

ANCHOR QEA

Figure 5
Mercury Concentrations -10 to -16 feet MLLW
Alamitos Bay Marina Basin 1

Sample Location

Mercury Concentration (ppm)

High : 2.59369

Low : 0.042564

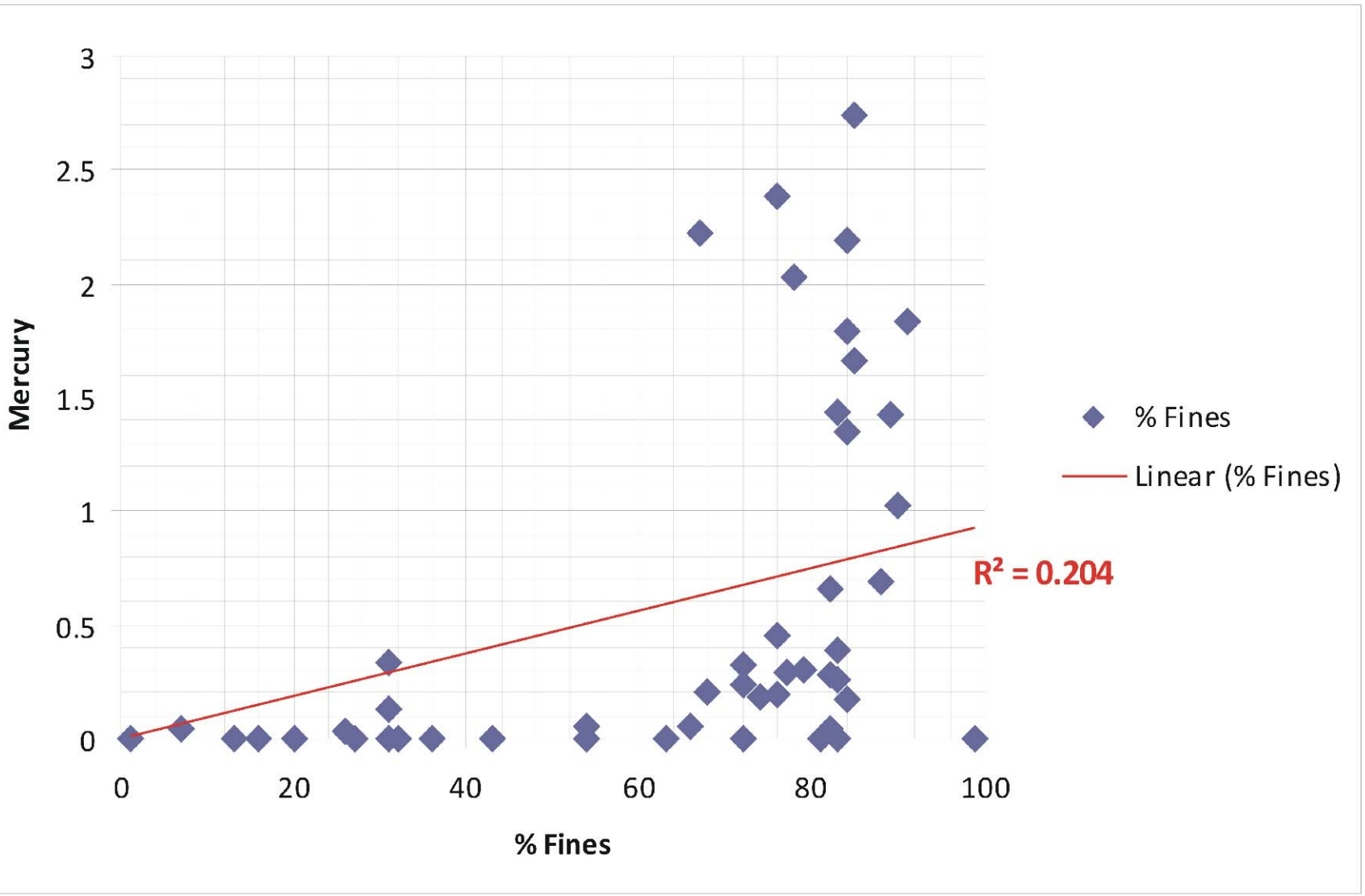
Note:
1. High and low values from all interval depths and all sample locations.
2. Non-detect value calculated as 0.05 in IDW.

Feet
0 75 150

Q:\Jobs\080548-01_Alamitos_Bay_Marina\Maps\2009_03\Hg_10to16_SEcornermxd nkochie 04/29/2009 3:00 PM

Figure 6
Mercury Concentrations -10 to -16 feet MLLW
Alamitos Bay Marina Basin 1

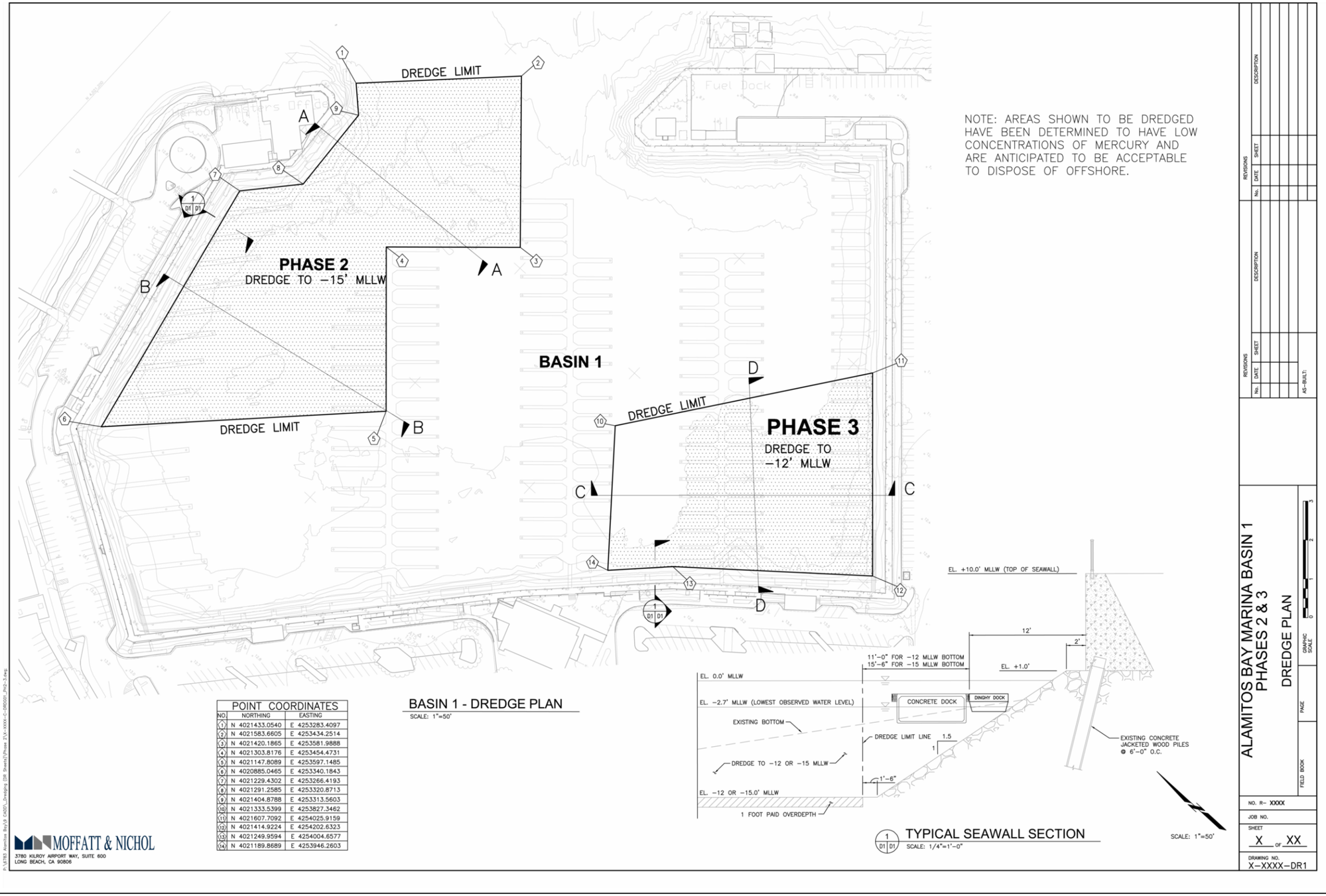
ANCHOR QEA



Apr 29, 2009 9:31am cdavidson K:\Jobs\080548-Long Beach On-Call\080548-01 Alamitos Bay\080548801-RP-003.dwg FIG 7

Figure 7
Mercury Concentration by Grain Size
Alamitos Bay Marina Basin 1

ANCHOR QEA



NOTE: AREAS SHOWN TO BE DREDGED HAVE BEEN DETERMINED TO HAVE LOW CONCENTRATIONS OF MERCURY AND ARE ANTICIPATED TO BE ACCEPTABLE TO DISPOSE OF OFFSHORE.

POINT COORDINATES		
NO.	NORTHING	EASTING
1	N 4021433.0540	E 4253283.4097
2	N 4021583.6605	E 4253434.2514
3	N 4021420.1865	E 4253581.9888
4	N 4021303.8176	E 4253454.4731
5	N 4021147.8089	E 4253597.1485
6	N 4020885.0465	E 4253340.1843
7	N 4021229.4302	E 4253266.4193
8	N 4021291.2585	E 4253320.8713
9	N 4021404.8788	E 4253313.5603
10	N 4021333.5399	E 4253827.3462
11	N 4021607.7092	E 4254025.9159
12	N 4021414.9224	E 4254202.6323
13	N 4021249.9594	E 4254004.6577
14	N 4021189.8689	E 4253946.2603

BASIN 1 - DREDGE PLAN
SCALE: 1"=50'

1 D1 D1 TYPICAL SEAWALL SECTION
SCALE: 1/4"=1'–0"

SCALE: 1"=50'

MOFFATT & NICHOL
3780 KILROY AIRPORT WAY, SUITE 600
LONG BEACH, CA 90806

REVISIONS: No. | DATE | SHEET | DESCRIPTION

AS–BUILT:

ALAMITOS BAY MARINA BASIN 1
PHASES 2 & 3
DREDGE PLAN

GRAPHIC SCALE: 0 1 2 3
PAGE
FIELD BOOK
NO. R– XXXX
JOB NO.
SHEET X OF XX
DRAWING NO. X–XXXX–DR1

Figure 8
Dredge Plan
Alamitos Bay Marina Basin 1

5 QUALITY ASSURANCE AND QUALITY CONTROL SUMMARY

Quality assurance/quality control (QA/QC) review entailed reviewing for sample integrity, achievement of target reporting limits, correct methodology, instrument calibration, and all appropriate QC requirements. Several duplicate samples were run to ensure consistency of results. Results for these samples were reviewed, and the data quality assessment found that all data were usable as qualified. Method blanks and laboratory control samples performed indicate that all laboratory methods were correct, and the data were released without qualification. For more information, please see the laboratory data package in Appendix B.

6 CONCLUSIONS AND RECOMMENDED SUITABILITY DETERMINATIONS

Based on the results presented in this report, and in combination with the previous Tier I through III results presented in the Weston reports (2007a and 2007b), the City of Long Beach hereby requests approval for ocean disposal at LA-2 for:

- Basin 1, dredge material from the prisms indicated in Figure 8
- Basins 2 through 7, all dredged material as described in the Weston reports (2007a and 2007b)

Again, the corresponding Tier III evaluations were presented in the Weston reports (2007a and 2007b). In Basin 1, the applicant has demonstrated that mercury concentrations in the requested areas are very low (below ERL to non-detect), and the grain size is unsuitable for beneficial reuse. All other material in Basin 1 (material from outside the prisms shown on Figure 8) would be taken to an approved off-site location.

The combined Alamitos Bay Marina Basin project (Basins 1 through 7) would include approximately 262,000 cy of ocean disposal phased over several years of construction. Note that moving forward, the City and the agencies will need to discuss phased reconfirmation of bulk chemical results, which would depend on the overall duration of the project.

7 REFERENCES

Anchor Environmental CA, L.P. (Anchor). 2009. Alamitos Bay Marina Basin 1 Supplemental Sampling and Analysis Plan (SSAP). Prepared for the City of Long Beach by Anchor. January, 2009.

Weston Solutions, Inc. (Weston). 2007a. Results of a Tier 3 Sediment Characterization with Samples from Alamitos Bay, Long Beach, California. Prepared by Weston on behalf of the City of Long Beach. July 2007.

Weston. 2007b. Follow-up Testing to the 2007 Alamitos Bay Marina Sediment Suitability Study. Prepared by Weston on behalf of the City of Long Beach. October 2007.

APPENDIX A
FIELD RECORDING FORMS

Sediment Core Collection Form

Station ID: ABM-CS-1 **Date:** 2-19-09

Project Name: Alamitos Bay Marina Basin 1 **Project Number:** 080482-01 BG03 T4

Coordinates:
Lat/Northing 33° 44.9843' Long/Easting: 118° 06.7584'

Vertical Datum **MLLW** MLW Other:

Depth Measurement Sounder **Leadline**

Project Depth 12' **Overdredge** 2'

	Attempt 1	Attempt 2	Attempt 3
Time Start:	11:00		
(A) Measured Water Depth	11.0'		
(B) Tide Height	0.8'		
(C) Mudline Elevation	-10.2'		
(-A+B = C include sign of tide height as reported)			
Estimated Penetration Length	5'		
Description of Core Drive	Hard, steady push		
Refusal Encountered?	No		
Total Core Recover Length	3.1'		
Time End:			

Core Characteristics

Sediment Type	cobble, gravel, **sand** C M **F** , **silt** clay, **organic matter**	cobble, gravel, sand C M F , silt clay, organic matter	cobble, gravel, sand C M F , silt clay, organic matter
Sediment Color	**gray**, black, brown brown surface, olivine	gray, black, brown brown surface, olivine	gray, black, brown brown surface, olivine
Sediment Odor	None, **slight**, mod, strong **H_2S**, petroleum, septic	None, slight, mod, strong H_2S, petroleum, septic	None, slight, mod, strong H_2S, petroleum, septic
Any Layering Homogeneous	Layering – fine sandy silt on top. Fine grain sand bottom		

Comments:

Shells and rocks found throughout core

Recorded by: BAG, TLS

Visual Classification of Subsurface Core

ANCHOR QEA

Job	Alamitos Bay Marina Basin 1	Date	2.19.09
Job No.	080482-01 BG03 T4	Core Pushed By	TEG
Exploration/Core No.	ABM-CS-1	Core Logged By	TLS, BJ, JM (ABC)
Water Depth	11.0'	Type of Core	☐ Shelby ☐ Piston Core ■ Other- Vibracore
Mudline Elevation	-10.2'	Diameter of Core (inches)	4
Penetration Length (feet)	5	Core Quality	☐ Good ■ Fair ☐ Poor ☐ Disturbed
Core Recovery (feet)	3.1	Average % Compaction =	

Theoretical / Depth in (ft.) / Actual — Core Sections	Sample Interval	Sample Analytes	Classification and Remarks (Color, Consistency, Moisture, Grain Size, Sheen, Odor)
9"	01 01 Dup		fine sandy silt, shells, trash, rock, dark gray color, weak sulfide odor
1			
19"	02 02 Dup		fine sandy silt, shells, layer of organic debris at 12-13", dark gray color
2			
	03 03 Dup		fine grain sand, dark gray color, 4" rock at 17-18"
37.2" 3			end of core (~-15' MLLW)
4			
5			
6			
7			
8			
9			

Sediment Core Collection Form

Station ID: ABM-CS-2 **Date:** 2-19-09

Project Name: Alamitos Bay Marina Basin 1 **Project Number:** 080482-01 BG03 T4

Coordinates:
Lat/Northing 33° 44.9833' Long/Easting: 118° 06.7920'

Vertical Datum **MLLW** MLW Other:

Depth Measurement Sounder **Leadline**

Project Depth 12' **Overdredge** 2'

	Attempt 1	Attempt 2	Attempt 3
Time Start:	12:00		
(A) Measured Water Depth	11.6'		
(B) Tide Height	0.2'		
(C) Mudline Elevation	-11.4'		
(-A+B = C include sign of tide height as reported)			
Estimated Penetration Length	4'		
Description of Core Drive	Soft, easy push Softer surface layer		
Refusal Encountered?	No		
Total Core Recover Length	4.1'		
Time End:			

Core Characteristics

Sediment Type	cobble, gravel, **sand** C M **F** , **silt** **clay**, organic matter	cobble, gravel, sand C M F , silt clay, organic matter	cobble, gravel, sand C M F , silt clay, organic matter
Sediment Color	**gray**, black, brown brown surface, olivine	gray, black, brown brown surface, olivine	gray, black, brown brown surface, olivine
Sediment Odor	**None**, slight, mod, strong H_2S, petroleum, septic	None, slight, mod, strong H_2S, petroleum, septic	None, slight, mod, strong H_2S, petroleum, septic
Any Layering Homogeneous			

Comments:

Clay randomly found throughout core

Recorded by: BAG, TLS

Visual Classification of Subsurface Core

ANCHOR QEA

Job	Alamitos Bay Marina Basin 1	Date	2.19.09
Job No.	080482-01 BG03 T4	Core Pushed By	TEG
Exploration/Core No.	ABM-CS-2	Core Logged By	TLS, BJ, JM (ABC)
Water Depth	11.6'	Type of Core	☐ Shelby ☐ Piston Core ■ Other- Vibracore
Mudline Elevation	-11.4'	Diameter of Core (inches)	4
Penetration Length (feet)	4	Core Quality	■ Good ☐ Fair ☐ Poor ☐ Disturbed
Core Recovery (feet)	4.1	Average % Compaction =	

Theoretical / Depth in (ft.) / Actual — Core Sections	Sample Interval	Sample Analytes	Classification and Remarks (Color, Consistency, Moisture, Grain Size, Sheen, Odor)
	01		fine sandy silt, no odor, dark gray color
1			
16"	02		fine sandy silt with clay lenses, shell at 17"
22"			
2	03		gray clay
28"			
3			fine grain sand, gray color
	04		brown coloring spread throughout
49" 4			end of core (~-15.5' MLLW)
5			
6			
7			
8			
9			

Sediment Core Collection Form

Station ID:	ABM-CS-3	**Date:**	2-19-09
Project Name:	Alamitos Bay Marina Basin 1	**Project Number:**	080482-01 BG03 T4
Coordinates: Lat/Northing	33° 45.0191’	Long/Easting:	118° 06.7210’
Vertical Datum	**MLLW**	MLW	Other:
Depth Measurement	Sounder	**Leadline**	
Project Depth	12’	**Overdredge**	2’

	Attempt 1	Attempt 2	Attempt 3
Time Start:	9:30		
(A) Measured Water Depth	14.5’		
(B) Tide Height	2.3’		
(C) Mudline Elevation	-12.2’		
(-A+B = C include sign of tide height as reported)			
Estimated Penetration Length	6’		
Description of Core Drive	Hard push towards bottom		
Refusal Encountered?	No		
Total Core Recover Length	6’		
Time End:			

Core Characteristics

Sediment Type	cobble, gravel, **sand** C M **F** , **silt** clay, organic matter	cobble, gravel, sand C M F , silt clay, organic matter	cobble, gravel, sand C M F , silt clay, organic matter
Sediment Color	**gray**, black, brown brown surface, olivine	gray, black, brown brown surface, olivine	gray, black, brown brown surface, olivine
Sediment Odor	**None**, slight, mod, strong H_2S, petroleum, septic	None, slight, mod, strong H_2S, petroleum, septic	None, slight, mod, strong H_2S, petroleum, septic
Any Layering Homogeneous	Layering – fine sandy silt top, fine grain sand bottom		

Comments:

Rocks and shell fragments spread throughout core

Recorded by: BAG, TLS

Visual Classification of Subsurface Core

ANCHOR QEA

Job	Alamitos Bay Marina Basin 1	Date	2.19.09
Job No.	080482-01 BG03 T4	Core Pushed By	TEG
Exploration/Core No.	ABM-CS-3	Core Logged By	TLS, BJ, JM (ABC)
Water Depth	14.5'	Type of Core	☐ Shelby ☐ Piston Core ■ Other- Vibracore
Mudline Elevation	-12.2'	Diameter of Core (inches)	4
Penetration Length (feet)	6	Core Quality	■ Good ☐ Fair ☐ Poor ☐ Disturbed
Core Recovery (feet)	6	Average % Compaction =	

Theoretical / Depth in (ft.) / Actual — Core Sections	Sample Interval	Sample Analytes	Classification and Remarks (Color, Consistency, Moisture, Grain Size, Sheen, Odor)
	01		fine sandy silt, gray color, no odor, trash, shell fragments
1			
16"	02		fine grain sand, gray color, no odor, rocks at 24", 28", and 39"
2			small shell fragments
	03		
3			
	04		
4			
	05		
57"			
5			fine sandy silt, gray color
6			end of core (~-18' MLLW)
7			
8			
9			

Sediment Core Collection Form

Station ID:	ABM-CS-4	**Date:**	2-19-09
Project Name:	Alamitos Bay Marina Basin 1	**Project Number:**	080482-01 BG03 T4
Coordinates: Lat/Northing	33° 45.0191’	Long/Easting:	118° 06.7210’
Vertical Datum	**MLLW**	MLW	Other:
Depth Measurement	Sounder	**Leadline**	
Project Depth	12’	**Overdredge**	2’

	Attempt 1	Attempt 2	Attempt 3
Time Start:	1:30		
(A) Measured Water Depth	10.5’		
(B) Tide Height	0.0’		
(C) Mudline Elevation	-10.5’		
(-A+B = C include sign of tide height as reported)			
Estimated Penetration Length	4’		
Description of Core Drive	Very smooth, easy push		
Refusal Encountered?	No		
Total Core Recover Length	4’		
Time End:			

Core Characteristics

Sediment Type	cobble, gravel, **sand** C M **F** , **silt** clay, organic matter	cobble, gravel, sand C M F , silt clay, organic matter	cobble, gravel, sand C M F , silt clay, organic matter
Sediment Color	**gray**, black, brown brown surface, olivine	gray, black, brown brown surface, olivine	gray, black, brown brown surface, olivine
Sediment Odor	None, **slight**, mod, strong H_2S, **petroleum**, septic	None, slight, mod, strong H_2S, petroleum, septic	None, slight, mod, strong H_2S, petroleum, septic
Any Layering Homogeneous	Layering – silt, clay, and fine grained sand		

Comments:

Clay spread throughout bottom of core

Some shells and shell fragments found throughout core

Recorded by: BAG, TLS

Visual Classification of Subsurface Core

ANCHOR QEA

Job	Alamitos Bay Marina Basin 1	Date	2.19.09
Job No.	080482-01 BG03 T4	Core Pushed By	TEG
Exploration/Core No.	ABM-CS-4	Core Logged By	TLS, BJ, JM (ABC)
Water Depth	10.5'	Type of Core	☐ Shelby ☐ Piston Core ■ Other- Vibracore
Mudline Elevation	-10.5'	Diameter of Core (inches)	4
Penetration Length (feet)	4	Core Quality	■ Good ☐ Fair ☐ Poor ☐ Disturbed
Core Recovery (feet)	4	Average % Compaction =	

Theoretical Depth in (ft.) Actual Core Sections	Sample Interval	Sample Analytes	Classification and Remarks (Color, Consistency, Moisture, Grain Size, Sheen, Odor)
	01		silt, slight hydrocarbon odor, dark gray color
1			
	02		
19"			
2			silt, moderate hydrocarbon odor, dark gray color, shell at 19"
	03		
33"			
	04		clay, gray color with brown lenses
3			
37"			
	05		fine grain sand, shell fragments, clay lenses, gray color
4			end of core (~-14.5' MLLW)
5			
6			
7			
8			
9			

Sediment Core Collection Form

Station ID: ABM-CS-5 **Date:** 2-19-09

Project Name: Alamitos Bay Marina Basin 1 **Project Number:** 080482-01 BG03 T4

Coordinates:
Lat/Northing 33° 44.9388' Long/Easting: 118° 06.8274'

Vertical Datum **MLLW** MLW Other:

Depth Measurement Sounder **Leadline**

Project Depth 12' **Overdredge** 2'

	Attempt 1	Attempt 2	Attempt 3
Time Start:	2:30		
(A) Measured Water Depth	10.7'		
(B) Tide Height	0.4'		
(C) Mudline Elevation	-10.2'		
(-A+B = C include sign of tide height as reported)			
Estimated Penetration Length	4'		
Description of Core Drive	Soft, easy push		
Refusal Encountered?	No		
Total Core Recover Length	3.9'		
Time End:			

Core Characteristics

Sediment Type	cobble, gravel, **sand** C M **F** , **silt** clay, organic matter	cobble, gravel, sand C M F , silt clay, organic matter	cobble, gravel, sand C M F , silt clay, organic matter
Sediment Color	**gray**, black, brown brown surface, olivine	gray, black, brown brown surface, olivine	gray, black, brown brown surface, olivine
Sediment Odor	None, **slight**, mod, strong **H_2S**, petroleum, septic	None, slight, mod, strong H_2S, petroleum, septic	None, slight, mod, strong H_2S, petroleum, septic
Any Layering Homogeneous	Homogeneous		

Comments:

Color lightens with depth of core

Recorded by: BAG, TLS

Visual Classification of Subsurface Core

ANCHOR QEA

Job	Alamitos Bay Marina Basin 1	Date	2.19.09
Job No.	080482-01 BG03 T4	Core Pushed By	TEG
Exploration/Core No.	ABM-CS-5	Core Logged By	TLS, BJ, JM (ABC)
Water Depth	10.2'	Type of Core	☐ Shelby ☐ Piston Core ■ Other- Vibracore
Mudline Elevation	-10.2'	Diameter of Core (inches)	4
Penetration Length (feet)	4	Core Quality	■ Good ☐ Fair ☐ Poor ☐ Disturbed
Core Recovery (feet)	3.9	Average % Compaction =	

Theoretical / Depth in (ft.) / Actual / Core Sections	Sample Interval	Sample Analytes	Classification and Remarks (Color, Consistency, Moisture, Grain Size, Sheen, Odor)
	01		very slight odor, fine sandy silt dark gray to a lighter gray as core deepens
1	02		
2	03		
3	04		
45"	05		fine grain sand, gray color
4			end of core (~-14' MLLW)
5			
6			
7			
8			
9			

Sediment Core Collection Form

Station ID: ABM-CS-6 **Date:** 2-19-09

Project Name: Alamitos Bay Marina Basin 1 **Project Number:** 080482-01 BG03 T4

Coordinates:
Lat/Northing 33° 44.9670' Long/Easting: 118° 06.7977'

Vertical Datum **MLLW** MLW Other:

Depth Measurement Sounder **Leadline**

Project Depth 12' **Overdredge** 2'

	Attempt 1	Attempt 2	Attempt 3
Time Start:	3:00	3:45	4:20
(A) Measured Water Depth	9.7'	13.5'	13.8'
(B) Tide Height	0.7'	1.1'	1.9'
(C) Mudline Elevation	-9.0'	-12.4'	-11.9'
(-A+B = C include sign of tide height as reported)			
Estimated Penetration Length	5'	2'	3.5'
Description of Core Drive	Soft, easy push	Soft, easy push	Soft, easy push
Refusal Encountered?	No	No	No
Total Core Recover Length	0'	1.6'	3.5'
Time End:	3:40	4:15	

Core Characteristics

Sediment Type	cobble, gravel, sand C M F , silt clay, organic matter	cobble, gravel, sand C M F , silt clay, organic matter	cobble, gravel, **sand** C M **F** , **silt** clay, organic matter
Sediment Color	gray, black, brown brown surface, olivine	gray, black, brown brown surface, olivine	**gray**, black, brown brown surface, **olivine**
Sediment Odor	None, slight, mod, strong H_2S, petroleum, septic	None, slight, mod, strong H_2S, petroleum, septic	**None**, slight, mod, strong H_2S, petroleum, septic
Any Layering Homogeneous			Layering

Comments:

Attempt 1: Lost core tube in mud

Attempt 2: Short length

Recorded by: BAG, TLS

Visual Classification of Subsurface Core

ANCHOR QEA

Job	Alamitos Bay Marina Basin 1	Date	2.19.09
Job No.	080482-01 BG03 T4	Core Pushed By	TEG
Exploration/Core No.	ABM-CS-6	Core Logged By	TLS, BJ, JM (ABC)
Water Depth	13.8'	Type of Core	☐ Shelby ☐ Piston Core ■ Other- Vibracore
Mudline Elevation	-12.0'	Diameter of Core (inches)	4
Penetration Length (feet)	3.5	Core Quality	■ Good ☐ Fair ☐ Poor ☐ Disturbed
Core Recovery (feet)	3.5	Average % Compaction =	

Theoretical Depth in (ft.) Actual Core Sections	Sample Interval	Sample Analytes	Classification and Remarks (Color, Consistency, Moisture, Grain Size, Sheen, Odor)
	01		silt, no odor, dark gray color
1			
	02		wood debris at 14"
20"			
2			
	03		silt, olive green color
3			
	04		fine grain sand, bottom v-shaped fine sandy silt between 39.5" and 42"
42"			end of core (~-15.5' MLLW)
4			
5			
6			
7			
8			
9			

Sediment Core Collection Form

Station ID:	ABM-CS-7	**Date:**	2-19-09
Project Name:	Alamitos Bay Marina Basin 1	**Project Number:**	080482-01 BG03 T4
Coordinates: Lat/Northing	33° 44.8885’	Long/Easting:	118° 06.8516’
Vertical Datum	**MLLW**	MLW	Other:
Depth Measurement	Sounder	**Leadline**	
Project Depth	15’	**Overdredge**	2’

	Attempt 1	Attempt 2	Attempt 3
Time Start:			
(A) Measured Water Depth	14.0’		
(B) Tide Height	3.0’		
(C) Mudline Elevation	-11.0’		
(-A+B = C include sign of tide height as reported)			
Estimated Penetration Length	6’		
Description of Core Drive	Hard at end of drive		
Refusal Encountered?	No		
Total Core Recover Length	6.2’		
Time End:			

Core Characteristics

Sediment Type	cobble, gravel, **sand** C **M** F , **silt** clay, organic matter	cobble, gravel, sand C M F , silt clay, organic matter	cobble, gravel, sand C M F , silt clay, organic matter
Sediment Color	**gray**, black, brown brown surface, olivine	gray, black, brown brown surface, olivine	gray, black, brown brown surface, olivine
Sediment Odor	None, slight, **mod**, strong H_2S, **petroleum**, septic	None, slight, mod, strong H_2S, petroleum, septic	None, slight, mod, strong H_2S, petroleum, septic
Any Layering Homogeneous	Layerings		

Comments:

Shell fragments throughout core

Clay at bottom of core

Recorded by: JM (ABC), TLS

Visual Classification of Subsurface Core

ANCHOR QEA

Job	Alamitos Bay Marina Basin 1	Date	2.19.09
Job No.	080482-01 BG03 T4	Core Pushed By	TEG
Exploration/Core No.	ABM-CS-7	Core Logged By	TLS, BJ, JM (ABC)
Water Depth	14.0'	Type of Core	☐ Shelby ☐ Piston Core ■ Other- Vibracore
Mudline Elevation	-11.0'	Diameter of Core (inches)	4
Penetration Length (feet)	6	Core Quality	■ Good ☐ Fair ☐ Poor ☐ Disturbed
Core Recovery (feet)	6.2	Average % Compaction =	

Theoretical / Depth in (ft.) / Actual — Core Sections	Sample Interval	Sample Analytes	Classification and Remarks (Color, Consistency, Moisture, Grain Size, Sheen, Odor)
	01		fine sandy silt, moderate hydrocarbon odor, dark gray color, shell fragments
1	02		
25" 2	03		medium grain sand, gray color, shell fragments
3	04		
4			
51.6"	05		medium grain sand with clay, gray color, shells
5	06		
6			
74"			end of core (~-17' MLLW)
7			
8			
9			

Sediment Core Collection Form

Station ID:	ABM-CS-7	**Date:**	2-19-09
Project Name:	Alamitos Bay Marina Basin 1	**Project Number:**	080482-01 BG03 T4
Coordinates: Lat/Northing	33° 44.8885’	Long/Easting:	118° 06.8516’
Vertical Datum	**MLLW**	MLW	Other:
Depth Measurement	Sounder	**Leadline**	
Project Depth	15’	**Overdredge**	2’

	Attempt 1	Attempt 2	Attempt 3
Time Start:			
(A) Measured Water Depth	14.0’		
(B) Tide Height	3.0’		
(C) Mudline Elevation	-11.0’		
(-A+B = C include sign of tide height as reported)			
Estimated Penetration Length	6’		
Description of Core Drive	Hard at end of drive		
Refusal Encountered?	No		
Total Core Recover Length	6.2’		
Time End:			

Core Characteristics

Sediment Type	cobble, gravel, **sand** C **M** F , **silt** clay, organic matter	cobble, gravel, sand C M F , silt clay, organic matter	cobble, gravel, sand C M F , silt clay, organic matter
Sediment Color	**gray**, black, brown brown surface, olivine	gray, black, brown brown surface, olivine	gray, black, brown brown surface, olivine
Sediment Odor	None, slight, **mod**, strong H_2S, **petroleum**, septic	None, slight, mod, strong H_2S, petroleum, septic	None, slight, mod, strong H_2S, petroleum, septic
Any Layering Homogeneous	Layerings		

Comments:

Shell fragments throughout core

Clay at bottom of core

Recorded by: JM (ABC), TLS

Visual Classification of Subsurface Core

ANCHOR QEA

Job	Alamitos Bay Marina Basin 1	Date	2.20.09
Job No.	080482-01 BG03 T4	Core Pushed By	TEG
Exploration/Core No.	ABM-CS-8	Core Logged By	TLS, BJ, JM (ABC)
Water Depth	17.2'	Type of Core	☐ Shelby ☐ Piston Core ■ Other- Vibracore
Mudline Elevation	-12.6'	Diameter of Core (inches)	4
Penetration Length (feet)	6	Core Quality	■ Good ☐ Fair ☐ Poor ☐ Disturbed
Core Recovery (feet)	6	Average % Compaction =	

Theoretical Depth in (ft.) Actual Core Sections	Sample Interval	Sample Analytes	Classification and Remarks (Color, Consistency, Moisture, Grain Size, Sheen, Odor)
1	01		fine sandy silt, dark gray color, no odor, shell fragment at 10"
2	02		
29"			
3	03		medium grain sand, no odor, dark gray color
4	04		
57"			
5			course grain sand with clay mixed throughout, no odor, dark gray color
			mixed vegetation throughout
6			end of core (~ -18.5' MLLW)
7			
8			
9			

Sediment Core Collection Form

Station ID: ABM-CS-9 **Date:** 2-20-09

Project Name: Alamitos Bay Marina Basin 1 **Project Number:** 080482-01 BG03 T4

Coordinates:
Lat/Northing 33° 45.0400' Long/Easting: 118° 06.8186'

Vertical Datum **MLLW** MLW Other:

Depth Measurement Sounder **Leadline**

Project Depth 12' **Overdredge** 2'

	Attempt 1	Attempt 2	Attempt 3
Time Start:	8:45		
(A) Measured Water Depth	15.1'		
(B) Tide Height	3.3'		
(C) Mudline Elevation	-11.8'		
(-A+B = C include sign of tide height as reported)			
Estimated Penetration Length	3'		
Description of Core Drive	Easy push		
Refusal Encountered?	No		
Total Core Recover Length	2.8'		
Time End:	9:45		

Core Characteristics

Sediment Type	cobble, gravel, sand C M F , **silt** clay, organic matter	cobble, gravel, sand C M F , silt clay, organic matter	cobble, gravel, sand C M F , silt clay, organic matter
Sediment Color	**gray**, black, brown brown surface, olivine	gray, black, brown brown surface, olivine	gray, black, brown brown surface, olivine
Sediment Odor	None, **slight**, mod, strong **H_2S**, petroleum, septic	None, slight, mod, strong H_2S, petroleum, septic	None, slight, mod, strong H_2S, petroleum, septic
Any Layering Homogeneous	Homogeneous		

Comments:

Cored too much, removed bottom 1' on boat, dark fine sandy silt

Relocated core due to deep depth at original location

Recorded by: DWF, TLS

Visual Classification of Subsurface Core

ANCHOR QEA

Job	Alamitos Bay Marina Basin 1	Date	2.20.09
Job No.	080482-01 BG03 T4	Core Pushed By	TEG
Exploration/Core No.	ABM-CS-9	Core Logged By	TLS, BJ, JM (ABC)
Water Depth	15.1'	Type of Core	☐ Shelby ☐ Piston Core ■ Other- Vibracore
Mudline Elevation	-11.8'	Diameter of Core (inches)	4
Penetration Length (feet)	3	Core Quality	■ Good ☐ Fair ☐ Poor ☐ Disturbed
Core Recovery (feet)	2.8	Average % Compaction =	

Theoretical / Depth in (ft.) / Actual — Core Sections	Sample Interval	Sample Analytes	Classification and Remarks (Color, Consistency, Moisture, Grain Size, Sheen, Odor)
	01		fine sandy silty, dark gray color, slight sulfuric odor
1			
	02		
2			
	03		shell fragments at 30"
34"			end of core (~ 15' MLLW)
3			
4			
5			
6			
7			
8			
9			

Sediment Core Collection Form

Station ID:	ABM-CS-10	**Date:**	2-20-09
Project Name:	Alamitos Bay Marina Basin 1	**Project Number:**	080482-01 BG03 T4
Coordinates: Lat/Northing	33° 45.0070’	Long/Easting:	118° 06.8391’
Vertical Datum	**MLLW**	MLW	Other:
Depth Measurement	Sounder	**Leadline**	
Project Depth	12’	**Overdredge**	2’

	Attempt 1	Attempt 2	Attempt 3
Time Start:	10:35		
(A) Measured Water Depth	14.1’		
(B) Tide Height	2.0’		
(C) Mudline Elevation	-12.1’		
(-A+B = C include sign of tide height as reported)			
Estimated Penetration Length	4’		
Description of Core Drive	Easy push		
Refusal Encountered?	No		
Total Core Recover Length	3.25’		
Time End:	11:00		

Core Characteristics

Sediment Type	cobble, gravel, **sand** C M **F** , **silt** clay, organic matter	cobble, gravel, sand C M F , silt clay, organic matter	cobble, gravel, sand C M F , silt clay, organic matter
Sediment Color	**gray**, black, brown brown surface, olivine	gray, black, brown brown surface, olivine	gray, black, brown brown surface, olivine
Sediment Odor	None, **slight**, mod, strong **H_2S**, petroleum, septic	None, slight, mod, strong H_2S, petroleum, septic	None, slight, mod, strong H_2S, petroleum, septic
Any Layering Homogeneous	Homogeneous		

Comments:

Relocated due to original location being too deep

Recorded by: DWF, TLS

Visual Classification of Subsurface Core

ANCHOR QEA

Job	Alamitos Bay Marina Basin 1	Date	2.20.09
Job No.	080482-01 BG03 T4	Core Pushed By	TEG
Exploration/Core No.	ABM-CS-10	Core Logged By	TLS, BJ, JM (ABC)
Water Depth	14.1'	Type of Core	☐ Shelby ☐ Piston Core ■ Other- Vibracore
Mudline Elevation	-12.1'	Diameter of Core (inches)	4
Penetration Length (feet)	4	Core Quality	■ Good ☐ Fair ☐ Poor ☐ Disturbed
Core Recovery (feet)	3.25	Average % Compaction =	

Theoretical Depth in (ft.) Actual Core Sections	Sample Interval	Sample Analytes	Classification and Remarks (Color, Consistency, Moisture, Grain Size, Sheen, Odor)
	01		fine sandy silt, slight sulfuric odor, dark gray color
1			
	02		
2			shell at 26.5"
35" 3			fine grain sand
39"			end of core (~ -15.5' MLLW)
4			
5			
6			
7			
8			
9			

Sediment Core Collection Form

Station ID:	ABM-CS-11	**Date:**	2-20-09
Project Name:	Alamitos Bay Marina Basin 1	**Project Number:**	080482-01 BG03 T4
Coordinates: Lat/Northing	33° 45.9641’	Long/Easting:	118° 06.8395’
Vertical Datum	**MLLW**	MLW	Other:
Depth Measurement	Sounder	**Leadline**	
Project Depth	12’	**Overdredge**	2’

	Attempt 1	Attempt 2	Attempt 3
Time Start:	11:28		
(A) Measured Water Depth	12.7’		
(B) Tide Height	1.0’		
(C) Mudline Elevation	-11.7’		
(-A+B = C include sign of tide height as reported)			
Estimated Penetration Length	4’		
Description of Core Drive	Easy push		
Refusal Encountered?	No		
Total Core Recover Length	3.5’		
Time End:	11:50		

Core Characteristics

Sediment Type	cobble, gravel, sand C M F , **silt** clay, organic matter	cobble, gravel, sand C M F , silt clay, organic matter	cobble, gravel, sand C M F , silt clay, organic matter
Sediment Color	**gray**, black, brown brown surface, olivine	gray, black, brown brown surface, olivine	gray, black, brown brown surface, olivine
Sediment Odor	None, **slight**, mod, strong **H_2S**, petroleum, septic	None, slight, mod, strong H_2S, petroleum, septic	None, slight, mod, strong H_2S, petroleum, septic
Any Layering Homogeneous	Homogeneous		
Comments:			

Recorded by: DWF, TLS

Visual Classification of Subsurface Core

ANCHOR QEA

Job	Alamitos Bay Marina Basin 1	Date	2.20.09
Job No.	080482-01 BG03 T4	Core Pushed By	TEG
Exploration/Core No.	ABM-CS-11	Core Logged By	TLS, BJ, JM (ABC)
Water Depth	12.7'	Type of Core	☐ Shelby ☐ Piston Core ■ Other- Vibracore
Mudline Elevation	-11.7'	Diameter of Core (inches)	4
Penetration Length (feet)	4	Core Quality	☐ Good ■ Fair ☐ Poor ☐ Disturbed
Core Recovery (feet)	3.5	Average % Compaction =	

Theoretical / Depth in (ft.) / Actual — Core Sections	Sample Interval	Sample Analytes	Classification and Remarks (Color, Consistency, Moisture, Grain Size, Sheen, Odor)
	01		fine sandy silt, dark gray color, slight sulfuric odor
1			
	02		piece of black plastic at 18"
2			
3			
42"			end of core (~ -16' MLLW)
4			
5			
6			
7			
8			
9			

Sediment Core Collection Form

Station ID:	ABM-CS-12	**Date:**	2-20-09
Project Name:	Alamitos Bay Marina Basin 1	**Project Number:**	080482-01 BG03 T4
Coordinates: Lat/Northing	33° 44.9461’	Long/Easting:	118° 06.9027’
Vertical Datum	**MLLW**	MLW	Other:
Depth Measurement	Sounder	**Leadline**	
Project Depth	15’	**Overdredge**	2’

	Attempt 1	Attempt 2	Attempt 3
Time Start:	12:00		
(A) Measured Water Depth	11.9’		
(B) Tide Height	0.5’		
(C) Mudline Elevation	-11.4’		
(-A+B = C include sign of tide height as reported)			
Estimated Penetration Length	7’		
Description of Core Drive	Easy push		
Refusal Encountered?	Yes, at 7’		
Total Core Recover Length	7’		
Time End:	12:27		

Core Characteristics

Sediment Type	cobble, gravel, **sand** C M **F** , **silt** clay, organic matter	cobble, gravel, sand C M F , silt clay, organic matter	cobble, gravel, sand C M F , silt clay, organic matter
Sediment Color	**gray**, black, brown brown surface, olivine	gray, black, brown brown surface, olivine	gray, black, brown brown surface, olivine
Sediment Odor	None, **slight**, mod, strong **H_2S**, petroleum, septic	None, slight, mod, strong H_2S, petroleum, septic	None, slight, mod, strong H_2S, petroleum, septic
Any Layering Homogeneous	Homogeneous		

Comments:

Some shells and shell fragments throughout core

Recorded by: DWF, TLS

Visual Classification of Subsurface Core

ANCHOR QEA

Job	Alamitos Bay Marina Basin 1	Date	2.20.09
Job No.	080482-01 BG03 T4	Core Pushed By	TEG
Exploration/Core No.	ABM-CS-12	Core Logged By	TLS, BJ, JM (ABC)
Water Depth	11.9'	Type of Core	☐ Shelby ☐ Piston Core ■ Other- Vibracore
Mudline Elevation	-11.4'	Diameter of Core (inches)	4
Penetration Length (feet)	7	Core Quality	■ Good ☐ Fair ☐ Poor ☐ Disturbed
Core Recovery (feet)	7	Average % Compaction =	

Theoretical / Depth in (ft.) / Actual — Core Sections	Sample Interval	Sample Analytes	Classification and Remarks (Color, Consistency, Moisture, Grain Size, Sheen, Odor)
	01		fine sandy silt, slight sulfuric odor, dark gray color, shell at the top
1	02		
2	03		
3	04		
4	05		
5	06		shell fragment at 60"
6			
81"			fine grain sand, gray color, slight odor
7			end of core (~ -18.5' MLLW)
8			
9			

APPENDIX B
LABTORATORY DATA PACKAGE

Calscience Environmental Laboratories, Inc.

February 27, 2009

Scott Johnson
Aquatic Bioassay & Consulting Laboratories
29 North Olive Street
Ventura, CA 93001-2552

Subject: **Calscience Work Order No.: 09-02-1819**
Client Reference: Alamitos Bay Marina Basin

Dear Client:

Enclosed is an analytical report for the above-referenced project. The samples included in this report were received 2/19/2009 and analyzed in accordance with the attached chain-of-custody.

Unless otherwise noted, all analytical testing was accomplished in accordance with the guidelines established in our Quality Systems Manual, applicable standard operating procedures, and other related documentation. The original report of subcontracted analysis, if any, is provided herein, and follows the standard Calscience data package. The results in this analytical report are limited to the samples tested and any reproduction thereof must be made in its entirety.

If you have any questions regarding this report, please do not hesitate to contact the undersigned.

Sincerely,

Calscience Environmental
Laboratories, Inc.
Robert Stearns
Project Manager

Calscience Environmental Laboratories, Inc.

Analytical Report

Aquatic Bioassay & Consulting Laboratories	Date Received: 02/19/09
29 North Olive Street	Work Order No: 09-02-1819
Ventura, CA 93001-2552	Preparation: EPA 7471A Total
	Method: EPA 7471A

Project: Alamitos Bay Marina Basin

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
ABM-CS-7-01	**09-02-1819-1-A**	**02/19/09 09:33**	**Solid**	**Mercury**	**02/20/09**	**02/20/09 15:28**	**090220L01**

-Results are reported on a dry weight basis.

Parameter	Result	RL	DF	Qual	Units
Mercury	1.35	0.0327	1		mg/kg

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
ABM-CS-7-02	**09-02-1819-2-A**	**02/19/09 09:33**	**Solid**	**Mercury**	**02/20/09**	**02/20/09 15:31**	**090220L01**

-Results are reported on a dry weight basis.

Parameter	Result	RL	DF	Qual	Units
Mercury	2.22	0.0309	1		mg/kg

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
ABM-CS-7-03	**09-02-1819-3-A**	**02/19/09 09:33**	**Solid**	**Mercury**	**02/20/09**	**02/20/09 15:33**	**090220L01**

-Results are reported on a dry weight basis.

Parameter	Result	RL	DF	Qual	Units
Mercury	0.337	0.0264	1		mg/kg

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
ABM-CS-7-04	**09-02-1819-4-A**	**02/19/09 09:33**	**Solid**	**Mercury**	**02/20/09**	**02/20/09 15:35**	**090220L01**

-Results are reported on a dry weight basis.

Parameter	Result	RL	DF	Qual	Units
Mercury	ND	0.0258	1		mg/kg

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
ABM-CS-7-05	**09-02-1819-5-A**	**02/19/09 09:33**	**Solid**	**Mercury**	**02/20/09**	**02/20/09 15:37**	**090220L01**

-Results are reported on a dry weight basis.

Parameter	Result	RL	DF	Qual	Units
Mercury	ND	0.0250	1		mg/kg

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
ABM-CS-7-06	**09-02-1819-6-A**	**02/19/09 09:33**	**Solid**	**Mercury**	**02/20/09**	**02/20/09 15:40**	**090220L01**

-Results are reported on a dry weight basis.

Parameter	Result	RL	DF	Qual	Units
Mercury	ND	0.0248	1		mg/kg

RL - Reporting Limit , DF - Dilution Factor , Qual - Qualifiers

Calscience Environmental Laboratories, Inc.

Analytical Report

Aquatic Bioassay & Consulting Laboratories
29 North Olive Street
Ventura, CA 93001-2552

Date Received: 02/19/09
Work Order No: 09-02-1819
Preparation: EPA 7471A Total
Method: EPA 7471A

Project: Alamitos Bay Marina Basin

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
ABM-CS-3-01	**09-02-1819-7-A**	**02/19/09 10:20**	**Solid**	**Mercury**	**02/20/09**	**02/20/09 15:48**	**090220L01**

-Results are reported on a dry weight basis.

Parameter	Result	RL	DF	Qual	Units
Mercury	1.42	0.0355	1		mg/kg

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
ABM-CS-3-02	**09-02-1819-8-A**	**02/19/09 10:20**	**Solid**	**Mercury**	**02/20/09**	**02/20/09 15:50**	**090220L01**

-Results are reported on a dry weight basis.

Parameter	Result	RL	DF	Qual	Units
Mercury	0.131	0.0287	1		mg/kg

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
ABM-CS-3-03	**09-02-1819-9-A**	**02/19/09 10:20**	**Solid**	**Mercury**	**02/20/09**	**02/20/09 15:52**	**090220L01**

-Results are reported on a dry weight basis.

Parameter	Result	RL	DF	Qual	Units
Mercury	0.0363	0.0270	1		mg/kg

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
ABM-CS-3-04	**09-02-1819-10-A**	**02/19/09 10:20**	**Solid**	**Mercury**	**02/20/09**	**02/20/09 15:54**	**090220L01**

-Results are reported on a dry weight basis.

Parameter	Result	RL	DF	Qual	Units
Mercury	ND	0.0278	1		mg/kg

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
ABM-CS-3-05	**09-02-1819-11-A**	**02/19/09 10:20**	**Solid**	**Mercury**	**02/20/09**	**02/20/09 15:56**	**090220L01**

-Results are reported on a dry weight basis.

Parameter	Result	RL	DF	Qual	Units
Mercury	ND	0.0264	1		mg/kg

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
ABM-CS-1-01	**09-02-1819-12-A**	**02/19/09 11:36**	**Solid**	**Mercury**	**02/20/09**	**02/20/09 15:59**	**090220L01**

-Results are reported on a dry weight basis.

Parameter	Result	RL	DF	Qual	Units
Mercury	ND	0.0288	1		mg/kg

RL - Reporting Limit , DF - Dilution Factor , Qual - Qualifiers

Calscience Environmental Laboratories, Inc.

Analytical Report

Aquatic Bioassay & Consulting Laboratories
29 North Olive Street
Ventura, CA 93001-2552

Date Received: 02/19/09
Work Order No: 09-02-1819
Preparation: EPA 7471A Total
Method: EPA 7471A

Project: Alamitos Bay Marina Basin

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
ABM-CS-1-01 DUP	**09-02-1819-13-A**	**02/19/09 11:36**	**Solid**	**Mercury**	**02/20/09**	**02/20/09 16:01**	**090220L01**

-Results are reported on a dry weight basis.

Parameter	Result	RL	DF	Qual	Units
Mercury	0.0487	0.0316	1		mg/kg

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
ABM-CS-1-02	**09-02-1819-14-A**	**02/19/09 11:36**	**Solid**	**Mercury**	**02/20/09**	**02/20/09 16:03**	**090220L01**

-Results are reported on a dry weight basis.

Parameter	Result	RL	DF	Qual	Units
Mercury	ND	0.0281	1		mg/kg

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
ABM-CS-1-02 DUP	**09-02-1819-15-A**	**02/19/09 11:36**	**Solid**	**Mercury**	**02/20/09**	**02/20/09 16:05**	**090220L01**

-Results are reported on a dry weight basis.

Parameter	Result	RL	DF	Qual	Units
Mercury	0.242	0.0284	1		mg/kg

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
ABM-CS-1-03	**09-02-1819-16-A**	**02/19/09 11:36**	**Solid**	**Mercury**	**02/20/09**	**02/20/09 15:20**	**090220L01**

-Results are reported on a dry weight basis.

Parameter	Result	RL	DF	Qual	Units
Mercury	ND	0.0261	1		mg/kg

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
ABM-CS-1-03 DUP	**09-02-1819-17-A**	**02/19/09 11:36**	**Solid**	**Mercury**	**02/20/09**	**02/20/09 16:07**	**090220L01**

-Results are reported on a dry weight basis.

Parameter	Result	RL	DF	Qual	Units
Mercury	ND	0.0253	1		mg/kg

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
ABM-CS-2-01	**09-02-1819-18-A**	**02/19/09 12:45**	**Solid**	**Mercury**	**02/20/09**	**02/20/09 16:24**	**090220L01**

-Results are reported on a dry weight basis.

Parameter	Result	RL	DF	Qual	Units
Mercury	0.277	0.0347	1		mg/kg

RL - Reporting Limit , DF - Dilution Factor , Qual - Qualifiers

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Analytical Report

Aquatic Bioassay & Consulting Laboratories
29 North Olive Street
Ventura, CA 93001-2552

Date Received: 02/19/09
Work Order No: 09-02-1819
Preparation: EPA 7471A Total
Method: EPA 7471A

Project: Alamitos Bay Marina Basin

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
ABM-CS-2-02	**09-02-1819-19-A**	**02/19/09 12:45**	**Solid**	**Mercury**	**02/20/09**	**02/20/09 16:27**	**090220L01**

-Results are reported on a dry weight basis.

Parameter	Result	RL	DF	Qual	Units
Mercury	0.324	0.0299	1		mg/kg

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
ABM-CS-2-03	**09-02-1819-20-A**	**02/19/09 12:45**	**Solid**	**Mercury**	**02/20/09**	**02/20/09 16:29**	**090220L01**

-Results are reported on a dry weight basis.

Parameter	Result	RL	DF	Qual	Units
Mercury	ND	0.0300	1		mg/kg

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
ABM-CS-2-04	**09-02-1819-21-A**	**02/19/09 12:45**	**Solid**	**Mercury**	**02/20/09**	**02/20/09 15:22**	**090220L02**

-Results are reported on a dry weight basis.

Parameter	Result	RL	DF	Qual	Units
Mercury	ND	0.0266	1		mg/kg

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
ABM-CS-4-01	**09-02-1819-22-A**	**02/19/09 14:00**	**Solid**	**Mercury**	**02/20/09**	**02/20/09 16:31**	**090220L02**

-Results are reported on a dry weight basis.

Parameter	Result	RL	DF	Qual	Units
Mercury	0.172	0.0360	1		mg/kg

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
ABM-CS-4-02	**09-02-1819-23-A**	**02/19/09 14:00**	**Solid**	**Mercury**	**02/20/09**	**02/20/09 16:33**	**090220L02**

-Results are reported on a dry weight basis.

Parameter	Result	RL	DF	Qual	Units
Mercury	1.44	0.0335	1		mg/kg

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
ABM-CS-4-03	**09-02-1819-24-A**	**02/19/09 14:00**	**Solid**	**Mercury**	**02/20/09**	**02/20/09 16:36**	**090220L02**

-Results are reported on a dry weight basis.

Parameter	Result	RL	DF	Qual	Units
Mercury	1.79	0.0347	1		mg/kg

RL - Reporting Limit , DF - Dilution Factor , Qual - Qualifiers

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Analytical Report

Aquatic Bioassay & Consulting Laboratories
29 North Olive Street
Ventura, CA 93001-2552

Date Received: 02/19/09
Work Order No: 09-02-1819
Preparation: EPA 7471A Total
Method: EPA 7471A

Project: Alamitos Bay Marina Basin

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
ABM-CS-4-04	**09-02-1819-25-A**	**02/19/09 14:00**	**Solid**	**Mercury**	**02/20/09**	**02/20/09 16:38**	**090220L02**

-Results are reported on a dry weight basis.

Parameter	Result	RL	DF	Qual	Units
Mercury	1.03	0.0313	1		mg/kg

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
ABM-CS-4-05	**09-02-1819-26-A**	**02/19/09 14:00**	**Solid**	**Mercury**	**02/20/09**	**02/20/09 16:40**	**090220L02**

-Results are reported on a dry weight basis.

Parameter	Result	RL	DF	Qual	Units
Mercury	ND	0.0270	1		mg/kg

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
ABM-CS-5-01	**09-02-1819-27-A**	**02/19/09 14:50**	**Solid**	**Mercury**	**02/20/09**	**02/20/09 16:42**	**090220L02**

-Results are reported on a dry weight basis.

Parameter	Result	RL	DF	Qual	Units
Mercury	0.261	0.0349	1		mg/kg

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
ABM-CS-5-02	**09-02-1819-28-A**	**02/19/09 14:50**	**Solid**	**Mercury**	**02/20/09**	**02/20/09 16:45**	**090220L02**

-Results are reported on a dry weight basis.

Parameter	Result	RL	DF	Qual	Units
Mercury	0.658	0.0332	1		mg/kg

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
ABM-CS-5-03	**09-02-1819-29-A**	**02/19/09 14:50**	**Solid**	**Mercury**	**02/20/09**	**02/20/09 16:58**	**090220L02**

-Results are reported on a dry weight basis.

Parameter	Result	RL	DF	Qual	Units
Mercury	2.74	0.0302	1		mg/kg

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
ABM-CS-5-04	**09-02-1819-30-A**	**02/19/09 14:50**	**Solid**	**Mercury**	**02/20/09**	**02/20/09 17:00**	**090220L02**

-Results are reported on a dry weight basis.

Parameter	Result	RL	DF	Qual	Units
Mercury	0.0433	0.0292	1		mg/kg

RL - Reporting Limit , DF - Dilution Factor , Qual - Qualifiers

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Analytical Report

Aquatic Bioassay & Consulting Laboratories
29 North Olive Street
Ventura, CA 93001-2552

Date Received: 02/19/09
Work Order No: 09-02-1819
Preparation: EPA 7471A Total
Method: EPA 7471A

Project: Alamitos Bay Marina Basin

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
ABM-CS-5-05	**09-02-1819-31-A**	**02/19/09 14:50**	**Solid**	**Mercury**	**02/20/09**	**02/20/09 17:03**	**090220L02**

-Results are reported on a dry weight basis.

Parameter	Result	RL	DF	Qual	Units
Mercury	0.0575	0.0285	1		mg/kg

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
ABM-CS-6-01	**09-02-1819-32-A**	**02/19/09 16:45**	**Solid**	**Mercury**	**02/20/09**	**02/20/09 17:05**	**090220L02**

-Results are reported on a dry weight basis.

Parameter	Result	RL	DF	Qual	Units
Mercury	0.387	0.0363	1		mg/kg

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
ABM-CS-6-02	**09-02-1819-33-A**	**02/19/09 16:45**	**Solid**	**Mercury**	**02/20/09**	**02/20/09 17:07**	**090220L02**

-Results are reported on a dry weight basis.

Parameter	Result	RL	DF	Qual	Units
Mercury	2.03	0.0337	1		mg/kg

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
ABM-CS-6-03	**09-02-1819-34-A**	**02/19/09 16:45**	**Solid**	**Mercury**	**02/20/09**	**02/20/09 17:09**	**090220L02**

-Results are reported on a dry weight basis.

Parameter	Result	RL	DF	Qual	Units
Mercury	2.38	0.0315	1		mg/kg

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
ABM-CS-6-04	**09-02-1819-35-A**	**02/19/09 16:45**	**Solid**	**Mercury**	**02/20/09**	**02/20/09 17:11**	**090220L02**

-Results are reported on a dry weight basis.

Parameter	Result	RL	DF	Qual	Units
Mercury	ND	0.0266	1		mg/kg

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
Method Blank	**099-12-452-94**	**N/A**	**Solid**	**Mercury**	**02/20/09**	**02/20/09 14:53**	**090220L01**

Parameter	Result	RL	DF	Qual	Units
Mercury	ND	0.0200	1		mg/kg

RL - Reporting Limit , DF - Dilution Factor , Qual - Qualifiers

Calscience Environmental Laboratories, Inc.

Analytical Report

Aquatic Bioassay & Consulting Laboratories
29 North Olive Street
Ventura, CA 93001-2552

Date Received: 02/19/09
Work Order No: 09-02-1819
Preparation: EPA 7471A Total
Method: EPA 7471A

Project: Alamitos Bay Marina Basin

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
Method Blank	**099-12-452-95**	**N/A**	**Solid**	**Mercury**	**02/20/09**	**02/20/09 14:55**	**090220L02**

Parameter	Result	RL	DF	Qual	Units
Mercury	ND	0.0200	1		mg/kg

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Analytical Report

Aquatic Bioassay & Consulting Laboratories
29 North Olive Street
Ventura, CA 93001-2552

Date Received: 02/19/09
Work Order No: 09-02-1819

Project: Alamitos Bay Marina Basin

Client Sample Number	Lab Sample Number	Date Collected	Matrix
ABM-CS-7-01	**09-02-1819-1**	**02/19/09**	**Solid**

Parameter	Result	RL	DF	Qual	Units	Date Prepared	Date Analyzed	Method
Solids, Total	61.3	0.100	1		%	02/25/09	02/25/09	SM 2540 B

Client Sample Number	Lab Sample Number	Date Collected	Matrix
ABM-CS-7-02	**09-02-1819-2**	**02/19/09**	**Solid**

Parameter	Result	RL	DF	Qual	Units	Date Prepared	Date Analyzed	Method
Solids, Total	64.8	0.100	1		%	02/25/09	02/25/09	SM 2540 B

Client Sample Number	Lab Sample Number	Date Collected	Matrix
ABM-CS-7-03	**09-02-1819-3**	**02/19/09**	**Solid**

Parameter	Result	RL	DF	Qual	Units	Date Prepared	Date Analyzed	Method
Solids, Total	75.8	0.100	1		%	02/25/09	02/25/09	SM 2540 B

Client Sample Number	Lab Sample Number	Date Collected	Matrix
ABM-CS-7-04	**09-02-1819-4**	**02/19/09**	**Solid**

Parameter	Result	RL	DF	Qual	Units	Date Prepared	Date Analyzed	Method
Solids, Total	77.8	0.100	1		%	02/25/09	02/25/09	SM 2540 B

Client Sample Number	Lab Sample Number	Date Collected	Matrix
ABM-CS-7-05	**09-02-1819-5**	**02/19/09**	**Solid**

Parameter	Result	RL	DF	Qual	Units	Date Prepared	Date Analyzed	Method
Solids, Total	80.3	0.100	1		%	02/25/09	02/25/09	SM 2540 B

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Aquatic Bioassay & Consulting Laboratories
29 North Olive Street
Ventura, CA 93001-2552

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Client Sample Number	Lab Sample Number	Date Collected	Matrix
ABM-CS-7-06	**09-02-1819-6**	**02/19/09**	**Solid**

Parameter	Result	RL	DF	Qual	Units	Date Prepared	Date Analyzed	Method
Solids, Total	80.9	0.100	1		%	02/25/09	02/25/09	SM 2540 B

Client Sample Number	Lab Sample Number	Date Collected	Matrix
ABM-CS-3-01	**09-02-1819-7**	**02/19/09**	**Solid**

Parameter	Result	RL	DF	Qual	Units	Date Prepared	Date Analyzed	Method
Solids, Total	56.5	0.100	1		%	02/25/09	02/25/09	SM 2540 B

Client Sample Number	Lab Sample Number	Date Collected	Matrix
ABM-CS-3-02	**09-02-1819-8**	**02/19/09**	**Solid**

Parameter	Result	RL	DF	Qual	Units	Date Prepared	Date Analyzed	Method
Solids, Total	69.8	0.100	1		%	02/25/09	02/25/09	SM 2540 B

Client Sample Number	Lab Sample Number	Date Collected	Matrix
ABM-CS-3-03	**09-02-1819-9**	**02/19/09**	**Solid**

Parameter	Result	RL	DF	Qual	Units	Date Prepared	Date Analyzed	Method
Solids, Total	74.1	0.100	1		%	02/25/09	02/25/09	SM 2540 B

Client Sample Number	Lab Sample Number	Date Collected	Matrix
ABM-CS-3-04	**09-02-1819-10**	**02/19/09**	**Solid**

Parameter	Result	RL	DF	Qual	Units	Date Prepared	Date Analyzed	Method
Solids, Total	72.0	0.100	1		%	02/25/09	02/25/09	SM 2540 B

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Analytical Report

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29 North Olive Street
Ventura, CA 93001-2552

Date Received: 02/19/09
Work Order No: 09-02-1819

Project: Alamitos Bay Marina Basin

Client Sample Number	Lab Sample Number	Date Collected	Matrix
ABM-CS-3-05	**09-02-1819-11**	**02/19/09**	**Solid**

Parameter	Result	RL	DF	Qual	Units	Date Prepared	Date Analyzed	Method
Solids, Total	75.9	0.100	1		%	02/25/09	02/25/09	SM 2540 B

Client Sample Number	Lab Sample Number	Date Collected	Matrix
ABM-CS-1-01	**09-02-1819-12**	**02/19/09**	**Solid**

Parameter	Result	RL	DF	Qual	Units	Date Prepared	Date Analyzed	Method
Solids, Total	69.7	0.100	1		%	02/25/09	02/25/09	SM 2540 B

Client Sample Number	Lab Sample Number	Date Collected	Matrix
ABM-CS-1-01 DUP	**09-02-1819-13**	**02/19/09**	**Solid**

Parameter	Result	RL	DF	Qual	Units	Date Prepared	Date Analyzed	Method
Solids, Total	63.4	0.100	1		%	02/25/09	02/25/09	SM 2540 B

Client Sample Number	Lab Sample Number	Date Collected	Matrix
ABM-CS-1-02	**09-02-1819-14**	**02/19/09**	**Solid**

Parameter	Result	RL	DF	Qual	Units	Date Prepared	Date Analyzed	Method
Solids, Total	71.3	0.100	1		%	02/25/09	02/25/09	SM 2540 B

Client Sample Number	Lab Sample Number	Date Collected	Matrix
ABM-CS-1-02 DUP	**09-02-1819-15**	**02/19/09**	**Solid**

Parameter	Result	RL	DF	Qual	Units	Date Prepared	Date Analyzed	Method
Solids, Total	70.5	0.100	1		%	02/25/09	02/25/09	SM 2540 B

RL - Reporting Limit , DF - Dilution Factor , Qual - Qualifiers

Calscience Environmental Laboratories, Inc.

Analytical Report

Aquatic Bioassay & Consulting Laboratories
29 North Olive Street
Ventura, CA 93001-2552

Date Received: 02/19/09
Work Order No: 09-02-1819

Project: Alamitos Bay Marina Basin

Client Sample Number	Lab Sample Number	Date Collected	Matrix
ABM-CS-1-03	**09-02-1819-16**	**02/19/09**	**Solid**

Parameter	Result	RL	DF	Qual	Units	Date Prepared	Date Analyzed	Method
Solids, Total	76.7	0.100	1		%	02/25/09	02/25/09	SM 2540 B

Client Sample Number	Lab Sample Number	Date Collected	Matrix
ABM-CS-1-03 DUP	**09-02-1819-17**	**02/19/09**	**Solid**

Parameter	Result	RL	DF	Qual	Units	Date Prepared	Date Analyzed	Method
Solids, Total	79.2	0.100	1		%	02/25/09	02/25/09	SM 2540 B

Client Sample Number	Lab Sample Number	Date Collected	Matrix
ABM-CS-2-01	**09-02-1819-18**	**02/19/09**	**Solid**

Parameter	Result	RL	DF	Qual	Units	Date Prepared	Date Analyzed	Method
Solids, Total	57.7	0.100	1		%	02/25/09	02/25/09	SM 2540 B

Client Sample Number	Lab Sample Number	Date Collected	Matrix
ABM-CS-2-02	**09-02-1819-19**	**02/19/09**	**Solid**

Parameter	Result	RL	DF	Qual	Units	Date Prepared	Date Analyzed	Method
Solids, Total	67.1	0.100	1		%	02/25/09	02/25/09	SM 2540 B

Client Sample Number	Lab Sample Number	Date Collected	Matrix
ABM-CS-2-03	**09-02-1819-20**	**02/19/09**	**Solid**

Parameter	Result	RL	DF	Qual	Units	Date Prepared	Date Analyzed	Method
Solids, Total	66.8	0.100	1		%	02/25/09	02/25/09	SM 2540 B

RL - Reporting Limit , DF - Dilution Factor , Qual - Qualifiers

Calscience Environmental Laboratories, Inc.

Analytical Report

Aquatic Bioassay & Consulting Laboratories
29 North Olive Street
Ventura, CA 93001-2552

Date Received: 02/19/09
Work Order No: 09-02-1819

Project: Alamitos Bay Marina Basin

Client Sample Number	Lab Sample Number	Date Collected	Matrix
ABM-CS-2-04	**09-02-1819-21**	**02/19/09**	**Solid**

Parameter	Result	RL	DF	Qual	Units	Date Prepared	Date Analyzed	Method
Solids, Total	75.3	0.100	1		%	02/25/09	02/25/09	SM 2540 B

Client Sample Number	Lab Sample Number	Date Collected	Matrix
ABM-CS-4-01	**09-02-1819-22**	**02/19/09**	**Solid**

Parameter	Result	RL	DF	Qual	Units	Date Prepared	Date Analyzed	Method
Solids, Total	55.7	0.100	1		%	02/25/09	02/25/09	SM 2540 B

Client Sample Number	Lab Sample Number	Date Collected	Matrix
ABM-CS-4-02	**09-02-1819-23**	**02/19/09**	**Solid**

Parameter	Result	RL	DF	Qual	Units	Date Prepared	Date Analyzed	Method
Solids, Total	59.9	0.100	1		%	02/25/09	02/25/09	SM 2540 B

Client Sample Number	Lab Sample Number	Date Collected	Matrix
ABM-CS-4-03	**09-02-1819-24**	**02/19/09**	**Solid**

Parameter	Result	RL	DF	Qual	Units	Date Prepared	Date Analyzed	Method
Solids, Total	57.8	0.100	1		%	02/25/09	02/25/09	SM 2540 B

Client Sample Number	Lab Sample Number	Date Collected	Matrix
ABM-CS-4-04	**09-02-1819-25**	**02/19/09**	**Solid**

Parameter	Result	RL	DF	Qual	Units	Date Prepared	Date Analyzed	Method
Solids, Total	64.1	0.100	1		%	02/25/09	02/25/09	SM 2540 B

RL - Reporting Limit , DF - Dilution Factor , Qual - Qualifiers

Calscience Environmental Laboratories, Inc.

Analytical Report

Aquatic Bioassay & Consulting Laboratories
29 North Olive Street
Ventura, CA 93001-2552

Date Received: 02/19/09
Work Order No: 09-02-1819

Project: Alamitos Bay Marina Basin

Client Sample Number	Lab Sample Number	Date Collected	Matrix
ABM-CS-4-05	**09-02-1819-26**	**02/19/09**	**Solid**

Parameter	Result	RL	DF	Qual	Units	Date Prepared	Date Analyzed	Method
Solids, Total	74.2	0.100	1		%	02/25/09	02/25/09	SM 2540 B

Client Sample Number	Lab Sample Number	Date Collected	Matrix
ABM-CS-5-01	**09-02-1819-27**	**02/19/09**	**Solid**

Parameter	Result	RL	DF	Qual	Units	Date Prepared	Date Analyzed	Method
Solids, Total	57.4	0.100	1		%	02/25/09	02/25/09	SM 2540 B

Client Sample Number	Lab Sample Number	Date Collected	Matrix
ABM-CS-5-02	**09-02-1819-28**	**02/19/09**	**Solid**

Parameter	Result	RL	DF	Qual	Units	Date Prepared	Date Analyzed	Method
Solids, Total	60.4	0.100	1		%	02/25/09	02/25/09	SM 2540 B

Client Sample Number	Lab Sample Number	Date Collected	Matrix
ABM-CS-5-03	**09-02-1819-29**	**02/19/09**	**Solid**

Parameter	Result	RL	DF	Qual	Units	Date Prepared	Date Analyzed	Method
Solids, Total	66.4	0.100	1		%	02/25/09	02/25/09	SM 2540 B

Client Sample Number	Lab Sample Number	Date Collected	Matrix
ABM-CS-5-04	**09-02-1819-30**	**02/19/09**	**Solid**

Parameter	Result	RL	DF	Qual	Units	Date Prepared	Date Analyzed	Method
Solids, Total	68.6	0.100	1		%	02/25/09	02/25/09	SM 2540 B

RL - Reporting Limit , DF - Dilution Factor , Qual - Qualifiers

Calscience Environmental Laboratories, Inc.

Analytical Report

Aquatic Bioassay & Consulting Laboratories
29 North Olive Street
Ventura, CA 93001-2552

Date Received: 02/19/09
Work Order No: 09-02-1819

Project: Alamitos Bay Marina Basin

Client Sample Number	Lab Sample Number	Date Collected	Matrix
ABM-CS-5-05	**09-02-1819-31**	**02/19/09**	**Solid**

Parameter	Result	RL	DF	Qual	Units	Date Prepared	Date Analyzed	Method
Solids, Total	70.3	0.100	1		%	02/25/09	02/25/09	SM 2540 B

Client Sample Number	Lab Sample Number	Date Collected	Matrix
ABM-CS-6-01	**09-02-1819-32**	**02/19/09**	**Solid**

Parameter	Result	RL	DF	Qual	Units	Date Prepared	Date Analyzed	Method
Solids, Total	55.2	0.100	1		%	02/25/09	02/25/09	SM 2540 B

Client Sample Number	Lab Sample Number	Date Collected	Matrix
ABM-CS-6-02	**09-02-1819-33**	**02/19/09**	**Solid**

Parameter	Result	RL	DF	Qual	Units	Date Prepared	Date Analyzed	Method
Solids, Total	59.4	0.100	1		%	02/25/09	02/25/09	SM 2540 B

Client Sample Number	Lab Sample Number	Date Collected	Matrix
ABM-CS-6-03	**09-02-1819-34**	**02/19/09**	**Solid**

Parameter	Result	RL	DF	Qual	Units	Date Prepared	Date Analyzed	Method
Solids, Total	63.7	0.100	1		%	02/25/09	02/25/09	SM 2540 B

Client Sample Number	Lab Sample Number	Date Collected	Matrix
ABM-CS-6-04	**09-02-1819-35**	**02/19/09**	**Solid**

Parameter	Result	RL	DF	Qual	Units	Date Prepared	Date Analyzed	Method
Solids, Total	75.4	0.100	1		%	02/25/09	02/25/09	SM 2540 B

RL - Reporting Limit , DF - Dilution Factor , Qual - Qualifiers

Calscience Environmental Laboratories, Inc.

Analytical Report

Aquatic Bioassay & Consulting Laboratories
29 North Olive Street
Ventura, CA 93001-2552

Date Received: 02/19/09
Work Order No: 09-02-1819

Project: Alamitos Bay Marina Basin

Client Sample Number	Lab Sample Number	Date Collected	Matrix
Method Blank		**N/A**	**Solid**

Parameter	Result	RL	DF	Qual	Units	Date Prepared	Date Analyzed	Method
Solids, Total	ND	0.100	1		%	02/25/09	02/25/09	SM 2540 B
Solids, Total	ND	0.100	1		%	02/25/09	02/25/09	SM 2540 B

RL - Reporting Limit , DF - Dilution Factor , Qual - Qualifiers

Calscience Environmental Laboratories, Inc.

Quality Control - Spike/Spike Duplicate

Aquatic Bioassay & Consulting Laboratories
29 North Olive Street
Ventura, CA 93001-2552

Date Received: 02/19/09
Work Order No: 09-02-1819
Preparation: EPA 7471A Total
Method: EPA 7471A

Project Alamitos Bay Marina Basin

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	MS/MSD Batch Number
ABM-CS-1-03	**Solid**	**Mercury**	**02/20/09**	**02/20/09**	**090220S01**

Parameter	MS %REC	MSD %REC	%REC CL	RPD	RPD CL	Qualifiers
Mercury	96	104	76-136	8	0-16	

RPD - Relative Percent Difference , CL - Control Limit

Calscience Environmental Laboratories, Inc.

Quality Control - Spike/Spike Duplicate

Aquatic Bioassay & Consulting Laboratories
29 North Olive Street
Ventura, CA 93001-2552

Date Received: 02/19/09
Work Order No: 09-02-1819
Preparation: EPA 7471A Total
Method: EPA 7471A

Project Alamitos Bay Marina Basin

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	MS/MSD Batch Number
ABM-CS-2-04	**Solid**	**Mercury**	**02/20/09**	**02/20/09**	**090220S02**

Parameter	MS %REC	MSD %REC	%REC CL	RPD	RPD CL	Qualifiers
Mercury	101	112	76-136	11	0-16	

RPD - Relative Percent Difference , CL - Control Limit

Calscience Environmental Laboratories, Inc.

Quality Control - Duplicate

Aquatic Bioassay & Consulting Laboratories
29 North Olive Street
Ventura, CA 93001-2552

Date Received: N/A
Work Order No: 09-02-1819

Project: Alamitos Bay Marina Basin

Matrix: Solid

Parameter	Method	QC Sample ID	Date Analyzed	Sample Conc	DUP Conc	RPD	RPD CL	Qualifiers
Solids, Total	SM 2540 B	ABM-CS-7-01	02/25/09	61.3	60.0	2	0-25	
Solids, Total	SM 2540 B	ABM-CS-2-04	02/25/09	75.3	74.5	1	0-25	

RPD - Relative Percent Difference , CL - Control Limit

Calscience Environmental Laboratories, Inc.

Quality Control - LCS/LCS Duplicate

Aquatic Bioassay & Consulting Laboratories
29 North Olive Street
Ventura, CA 93001-2552

Date Received: N/A
Work Order No: 09-02-1819
Preparation: EPA 7471A Total
Method: EPA 7471A

Project: Alamitos Bay Marina Basin

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number
099-12-452-94	**Solid**	**Mercury**	**02/20/09**	**02/20/09**	**090220L01**

Parameter	LCS %REC	LCSD %REC	%REC CL	RPD	RPD CL	Qualifiers
Mercury	102	103	82-124	1	0-16	

RPD - Relative Percent Difference , CL - Control Limit

Calscience Environmental Laboratories, Inc.

Quality Control - LCS/LCS Duplicate

Aquatic Bioassay & Consulting Laboratories
29 North Olive Street
Ventura, CA 93001-2552

Date Received: N/A
Work Order No: 09-02-1819
Preparation: EPA 7471A Total
Method: EPA 7471A

Project: Alamitos Bay Marina Basin

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number
099-12-452-95	**Solid**	**Mercury**	**02/20/09**	**02/20/09**	**090220L02**

Parameter	LCS %REC	LCSD %REC	%REC CL	RPD	RPD CL	Qualifiers
Mercury	102	104	82-124	1	0-16	

RPD - Relative Percent Difference , CL - Control Limit

Calscience Environmental Laboratories, Inc.

Glossary of Terms and Qualifiers

Work Order Number: 09-02-1819

Qualifier	Definition
*	See applicable analysis comment.
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 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 with no further corrective action required.
A	Result is the average of all dilutions, as defined by the method.
B	Analyte was present in the associated method blank.
C	Analyte presence was not confirmed on primary column.
E	Concentration exceeds the calibration range.
H	Sample received and/or analyzed past the recommended holding time.
J	Analyte was detected at a concentration below the reporting limit and above the laboratory method detection limit. Reported value is estimated.
ME	LCS Recovery Percentage is within LCS ME Control Limit range.
N	Nontarget Analyte.
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.
U	Undetected at the laboratory method detection limit.
X	% Recovery and/or RPD out-of-range.
Z	Analyte presence was not confirmed by second column or GC/MS analysis.

Calscience Environmental Laboratories, Inc.

[X] SoCal Laboratory
7440 Lincoln Way
Garden Grove, CA 92841-1427
(714) 895-5494

[ ] NorCal Service Center
5063 Commercial Circle, Suite H
Concord, CA 94520-8577
(925) 689-9022

CHAIN OF CUSTODY RECORD

Date 2.19.09
Page 1 of 4

LABORATORY CLIENT: ABC Laboratories
ADDRESS: 29 N. Olive St
CITY: Ventura STATE: CA ZIP: 93001
TEL: 805-643-5621 x11 E-MAIL: scott@aquabio.org

CLIENT PROJECT NAME / NUMBER: Alamitos Bay Marina Basin 1
P.O. NO.:
PROJECT CONTACT: Scott Johnson
LAB USE ONLY: 0 2 - 1 8 1 9
SAMPLER(S): (PRINT) Jim Mann
COELT LOG CODE:
COOLER RECEIPT TEMP= °C

TURNAROUND TIME: [ ] SAME DAY [ ] 24 HR [ ] 48 HR [ ] 72 HR [X] STANDARD

SPECIAL REQUIREMENTS (ADDITIONAL COSTS MAY APPLY): [ ] RWQCB REPORTING FORMS [ ] COELT EDF [X] Equis & edd

SPECIAL INSTRUCTIONS:

REQUESTED ANALYSES

LAB USE ONLY	SAMPLE ID	FIELD POINT NAME (FOR COELT EDF)	SAMPLING DATE	SAMPLING TIME	MATRIX	NO. OF CONT.	~~TPH (g)~~ ~~Metals~~ ~~method~~ ~~SW 846 6010/7470~~	TPH (d) or (C6-C36) or (C6-C44)	TPH ( )	BTEX / MTBE (8260B) or ( )	VOCs (8260B)	Oxygenates (8260B)	Encore Prep (5035)	SVOCs (8270C)	Pesticides (8081A)	PCBs (8082)	PNAs (8310) or (8270C)	T22 Metals (6010B/747X)	Cr(VI) [7196A or 7199 or 218.6]	VOCs (TO-14A) or (TO-15)	TPH (g) [TO-3]+	Mercury-7471A		
1	ABM-CS-7-01		2.19.09	0933	Sed																	X		
2	ABM-CS-7-02		2.19.09	0933	Sed																	X		
3	ABM-CS-7-03		2.19.09	0933	Sed																	X		
4	ABM-CS-7-04		2.19.09	0933	Sed																	X		
5	ABM-CS-7-05		2.19.09	0933	Sed																	X		
6	ABM-CS-7-06		2.19.09	0933	Sed																	X		
7	ABM-CS-3-01		2.19.09	1020	Sed																	X		
8	ABM-CS-3-02		2.19.09	1020	Sed																	X		
9	ABM-CS-3-03		2.19.09	1020	Sed																	X		
~~10~~			2.19.09	1020	Sed																	X		

Relinquished by: (Signature)	Received by: (Signature/Affiliation)	Date:	Time:
[signature]	[signature] CEL	02/19/09	17:00
[signature]	Danny Le CEL	2/19/09	17:40

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05/01/07 Revision

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(925) 689-9022

Date 2.19.09

Page 2 of 4

LABORATORY CLIENT: ABC Laboratories	CLIENT PROJECT NAME / NUMBER: Alamitos Bay Marina Basin 1
ADDRESS: 29 N. Olive St	P.O. NO.:
CITY: Ventura STATE: CA ZIP: 93001	PROJECT CONTACT: Scott Johnson
TEL: 805-643-5621 x 11 E-MAIL: Scott@aquabio.org	LAB USE ONLY: 02-1819
SAMPLER(S): (PRINT) Jim Mann	COELT LOG CODE: ☐☐☐☐
TURNAROUND TIME: ☐ SAME DAY ☐ 24 HR ☐ 48 HR ☐ 72 HR ☒ STANDARD	COOLER RECEIPT TEMP= °C
SPECIAL REQUIREMENTS (ADDITIONAL COSTS MAY APPLY) ☐ RWQCB REPORTING FORMS ☐ COELT EDF ☒ Equis & edd	
SPECIAL INSTRUCTIONS:	

REQUESTED ANALYSES

LAB USE ONLY	SAMPLE ID	FIELD POINT NAME (FOR COELT EDF)	SAMPLING DATE	SAMPLING TIME	MATRIX	NO. OF CONT.	TPH (g)	TPH (d) or (C6-C36) or (C6-C44)	TPH ( )	BTEX / MTBE (8260B) or ( )	VOCs (8260B)	Oxygenates (8260B)	Encore Prep (5035)	SVOCs (8270C)	Pesticides (8081A)	PCBs (8082)	PNAs (8310) or (8270C)	T22 Metals (6010B/747X)	Cr(VI) [7196A or 7199 or 218.6]	VOCs (TO-14A) or (TO-15)	TPH (g) [TO-3]+	Mercury-7471A
10	ABM-CS-3-04		2.19.09	1020	Sed																	X
11	ABM-CS-3-05		2.19.09	1020	Sed																	X
12	ABM-CS-1-01		2.19.09	1136	Sed																	X
13	ABM-CS-1-01(Dup)		2.19.09	1136	Sed																	X
14	ABM-CS-1-02		2.19.09	1136	Sed																	X
15	ABM-CS-1-02(Dup)		2.19.09	1136	Sed																	X
16	ABM-CS-1-03		2.19.09	1136	Sed																	X
17	ABM-CS-1-03(Dup)		2.19.09	1136	Sed																	X
18	ABM-CS-2-01		2.19.09	1245	Sed																	X
19	ABM-CS-2-02		2.19.09	1245	Sed																	X

Relinquished by: (Signature)	Received by: (Signature/Affiliation)	Date: 02/19/09	Time: 1700
Relinquished by: (Signature)	Received by: (Signature/Affiliation) Dannyle CEL	Date: 2/19/09	Time: 17:40
Relinquished by: (Signature)	Received by: (Signature/Affiliation)	Date:	Time:

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5063 Commercial Circle, Suite H
Concord, CA 94520-8577
(925) 689-9022

CHAIN OF CUSTODY RECORD

Date 2-19-09

Page 3 of 4

LABORATORY CLIENT: ABC Laboratories

ADDRESS: 29 N. Olive St

CITY: Ventura STATE: CA ZIP: 93001

TEL: 805-643-5621 x11 E-MAIL: Scott@aquabio.org

CLIENT PROJECT NAME / NUMBER: Alamitos Bay Marina Basin 1

P.O. NO.:

PROJECT CONTACT: Scott Johnson

LAB USE ONLY: 02-1819

SAMPLER(S): (PRINT) Jim Mann

COELT LOG CODE:

COOLER RECEIPT TEMP= °C

TURNAROUND TIME: ☐ SAME DAY ☐ 24 HR ☐ 48 HR ☐ 72 HR ☒ STANDARD

SPECIAL REQUIREMENTS (ADDITIONAL COSTS MAY APPLY)
☐ RWQCB REPORTING FORMS ☐ COELT EDF ☒ Equis # edd

SPECIAL INSTRUCTIONS:

REQUESTED ANALYSES

LAB USE ONLY	SAMPLE ID	FIELD POINT NAME (FOR COELT EDF)	SAMPLING DATE	SAMPLING TIME	MATRIX	NO. OF CONT.	TPH (g)	TPH (d) or (C6-C36) or (C6-C44)	TPH ( )	BTEX / MTBE (8260B) or ( )	VOCs (8260B)	Oxygenates (8260B)	Encore Prep (5035)	SVOCs (8270C)	Pesticides (8081A)	PCBs (8082)	PNAs (8310) or (8270C)	T22 Metals (6010B/747X)	Cr(VI) [7196A or 7199 or 218.6]	VOCs (TO-14A) or (TO-15)	TPH (g) [TO-3]+	Mercury-7471A		
20	ABM-CS-2-03		2-19-09	1245	Sed																	X		
21	ABM-CS-2-04		2-19-09	1245	Sed																	X		
22	ABM-CS-4-01		2-19-09	1400	Sed																	X		
23	ABM-CS-4-02		2-19-09	1400	Sed																	X		
24	ABM-CS-4-03		2-19-09	1400	Sed																	X		
25	ABM-CS-4-04		2-19-09	1400	Sed																	X		
26	ABM-CS-4-05		2-19-09	1400	Sed																	X		
27	ABM-CS-5-01		2-19-09	1450	Sed																	X		
28	ABM-CS-5-02		2-19-09	1450	Sed																	X		
29	ABM-CS-5-03		2-19-09	1450	Sed																	X		

Relinquished by: (Signature) BJohn	Received by: (Signature/Affiliation) CEL	Date: 02/19/09	Time: 17:00
Relinquished by: (Signature)	Received by: (Signature/Affiliation) Danny Le CEL	Date: 2/19/09	Time: 17:40
Relinquished by: (Signature)	Received by: (Signature/Affiliation)	Date:	Time:

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Concord, CA 94520-8577
(925) 689-9022

Date 2·19·09

Page 4 of 4

LABORATORY CLIENT: ABC Laboratories

ADDRESS: 29 N. Olive Street

CITY: Ventura STATE: CA ZIP: 93001

TEL: 805-643-5621 x11 E-MAIL: ScottC@aquabio.org

CLIENT PROJECT NAME / NUMBER: Alamitos Bay Marina Basin 1

P.O. NO.:

PROJECT CONTACT: Scott Johnson

LAB USE ONLY: 02-1819

SAMPLER(S): (PRINT) Jim Mann

COELT LOG CODE

COOLER RECEIPT TEMP= °C

TURNAROUND TIME:
☐ SAME DAY ☐ 24 HR ☐ 48 HR ☐ 72 HR ☒ STANDARD

SPECIAL REQUIREMENTS (ADDITIONAL COSTS MAY APPLY)
☐ RWQCB REPORTING FORMS ☐ COELT EDF ☒ Equis & edd

SPECIAL INSTRUCTIONS:

REQUESTED ANALYSES

LAB USE ONLY	SAMPLE ID	FIELD POINT NAME (FOR COELT EDF)	SAMPLING DATE	SAMPLING TIME	MATRIX	NO. OF CONT.	TPH (g)	TPH (d) or (C6-C36) or (C6-C44)	TPH ( )	BTEX / MTBE (8260B) or ( )	VOCs (8260B)	Oxygenates (8260B)	Encore Prep (5035)	SVOCs (8270C)	Pesticides (8081A)	PCBs (8082)	PNAs (8310) or (8270C)	T22 Metals (6010B/747X)	Cr(VI) [7196A or 7199 or 218.6]	VOCs (TO-14A) or (TO-15)	TPH (g) [TO-3]+	Mercury - 7471A		
30	ABM-CS-5-04		2·19·09	1450	Sed																	X		
31	ABM-CS-5-05		2·19·09	1450	Sed																	X		
32	ABM-CS-6-01		2·19·09	1645	Sed																	X		
33	ABM-CS-6-02		2·19·09	1645	Sed																	X		
34	ABM-CS-6-03		2·19·09	1645	Sed																	X		
35	ABM-CS-6-04		2·19·09	1645	Sed																	X		

Relinquished by: (Signature)	Received by: (Signature/Affiliation)	Date: 02/19/09	Time: 17:00
Relinquished by: (Signature)	Received by: (Signature/Affiliation) Danny le CEL	Date: 2/19/09	Time: 17:40
Relinquished by: (Signature)	Received by: (Signature/Affiliation)	Date:	Time:

DISTRIBUTION: White with final report, Green and Yellow to Client.
Please note that pages 1 and 2 of 2 of our T/Cs are printed on the reverse side of the Green and Yellow copies respectively.

05/01/07 Revision

Calscience Environmental Laboratories, Inc.

WORK ORDER #: 09-02-1819

SAMPLE RECEIPT FORM

Cooler 1 of 1

CLIENT: ABC. DATE: 02/19/09

TEMPERATURE: (Criteria: 0.0 °C – 6.0 °C, not frozen)

Temperature 1.4 °C - 0.2 °C (CF) = 1.2 °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 ☐ Metals Only ☐ PCBs Only **Initial:** VG

CUSTODY SEALS INTACT:

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

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

SAMPLE CONDITION:	Yes	No	N/A
Chain-Of-Custody (COC) document(s) received with samples.....	☑	☐	☐
COC document(s) received complete.....	☐	☑	☐
Sampler's name indicated on COC.....	☑	☐	☐
Sample container label(s) consistent with COC.....	☑	☐	☐
Sample container(s) intact and good condition.....	☑	☐	☐
Correct containers and volume for analyses requested.....	☑	☐	☐
Analyses received within holding time.....	☑	☐	☐
Proper preservation noted on COC or sample container.....	☐	☐	☑
Volatile analysis container(s) free of headspace.....	☐	☐	☑
Tedlar bag(s) free of condensation.....	☐	☐	☑

CONTAINER TYPE:

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

Water: ☐VOA ☐VOAh ☐VOAna_2 ☐125AGB ☐125AGBh ☐125AGBpo_4 ☐1AGB ☐1AGBna_2 ☐1AGBs ☐500AGB ☐500AGBs ☐250CGB ☐250CGBs ☐1PB ☐500PB ☐500PBna ☐250PB ☐250PBn ☐125PB ☐125PBznna ☐100PBsterile ☐100PBna_2 ☐_____ ☐_____ ☐_____

Air: ☐Tedlar® ☐Summa® ☐_____

Checked/Labeled by:

Container: C:Clear A:Amber P:Poly/Plastic G:Glass J:Jar B:Bottle

Reviewed by: YL

Preservative: h:HCL n:HNO_3 na_2:$Na_2S_2O_3$ na:NaOH po_4:H_3PO_4 s:H_2SO_4 znna:$ZnAc_2$+NaOH

Scanned by:

Calscience Environmental Laboratories, Inc.

WORK ORDER #: 09-02-1819

SAMPLE ANOMALY FORM

CHAIN OF CUSTODY (COC):

- ☐ **Not relinquished by client** – no signature
- ☐ **No date/time relinquished**
- ☐ **COC not received with samples** – notify PM
- ☑ **Incomplete information regarding samples, tests, etc.**

Comments:

Received 1 4oz. Jar for each sample.

SAMPLES - CONTAINERS & LABELS:

- ☐ **Samples NOT RECEIVED but listed on COC**
- ☐ **Samples 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
- ☐ **No preservative noted on label** – list test and notify lab
- ☐ **Sample labels illegible** – note test/container type
- ☐ **Sample labels do not match COC** – Note in comments
  - ☐ **Sample ID**
  - ☐ **Date and Time Collected**
  - ☐ **Project Information**
  - ☐ **# of containers**
- ☐ **Sample containers compromised** – Note in comments
  - ☐ **Leaking**
  - ☐ **Broken**
  - ☐ **Without Labels**
- ☐ **Other:** _____

Comments:

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 RSK or CO_2 or DO or Organic Lead Received

Comments: _____

Initial / Date 2/19/09

Calscience
Environmental
Laboratories, Inc.

February 27, 2009

Scott Johnson
Aquatic Bioassay & Consulting Laboratories
29 North Olive Street
Ventura, CA 93001-2552

Subject: **Calscience Work Order No.: 09-02-1922**
Client Reference: Alamitos Bay Marina Basin

Dear Client:

Enclosed is an analytical report for the above-referenced project. The samples included in this report were received 2/20/2009 and analyzed in accordance with the attached chain-of-custody.

Unless otherwise noted, all analytical testing was accomplished in accordance with the guidelines established in our Quality Systems Manual, applicable standard operating procedures, and other related documentation. The original report of subcontracted analysis, if any, is provided herein, and follows the standard Calscience data package. The results in this analytical report are limited to the samples tested and any reproduction thereof must be made in its entirety.

If you have any questions regarding this report, please do not hesitate to contact the undersigned.

Sincerely,

Calscience Environmental
Laboratories, Inc.
Robert Stearns
Project Manager

Calscience Environmental Laboratories, Inc.

Analytical Report

Aquatic Bioassay & Consulting Laboratories	Date Received: 02/20/09
29 North Olive Street	Work Order No: 09-02-1922
Ventura, CA 93001-2552	Preparation: EPA 7471A Total
	Method: EPA 7471A

Project: Alamitos Bay Marina Basin

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
ABM-CS-8-01	**09-02-1922-1-A**	**02/20/09 08:45**	**Solid**	**Mercury**	**02/20/09**	**02/20/09 20:23**	**090220L06**

-Results are reported on a dry weight basis.

Parameter	Result	RL	DF	Qual	Units
Mercury	1.66	0.0348	1		mg/kg

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
ABM-CS-8-02	**09-02-1922-2-A**	**02/20/09 08:45**	**Solid**	**Mercury**	**02/20/09**	**02/20/09 20:26**	**090220L06**

-Results are reported on a dry weight basis.

Parameter	Result	RL	DF	Qual	Units
Mercury	2.19	0.0333	1		mg/kg

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
ABM-CS-8-03	**09-02-1922-3-A**	**02/20/09 08:45**	**Solid**	**Mercury**	**02/20/09**	**02/20/09 20:28**	**090220L06**

-Results are reported on a dry weight basis.

Parameter	Result	RL	DF	Qual	Units
Mercury	0.0407	0.0283	1		mg/kg

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
ABM-CS-8-04	**09-02-1922-4-A**	**02/20/09 08:45**	**Solid**	**Mercury**	**02/20/09**	**02/20/09 20:30**	**090220L06**

-Results are reported on a dry weight basis.

Parameter	Result	RL	DF	Qual	Units
Mercury	ND	0.0266	1		mg/kg

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
ABM-CS-9-01	**09-02-1922-5-A**	**02/20/09 10:02**	**Solid**	**Mercury**	**02/20/09**	**02/20/09 20:37**	**090220L06**

-Results are reported on a dry weight basis.

Parameter	Result	RL	DF	Qual	Units
Mercury	0.692	0.0428	1		mg/kg

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
ABM-CS-9-02	**09-02-1922-6-A**	**02/20/09 10:02**	**Solid**	**Mercury**	**02/20/09**	**02/20/09 20:39**	**090220L06**

-Results are reported on a dry weight basis.

Parameter	Result	RL	DF	Qual	Units
Mercury	0.985	0.0359	1		mg/kg

RL - Reporting Limit , DF - Dilution Factor , Qual - Qualifiers

Calscience Environmental Laboratories, Inc.

Analytical Report

Aquatic Bioassay & Consulting Laboratories
29 North Olive Street
Ventura, CA 93001-2552

Date Received: 02/20/09
Work Order No: 09-02-1922
Preparation: EPA 7471A Total
Method: EPA 7471A

Project: Alamitos Bay Marina Basin

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
ABM-CS-9-03	**09-02-1922-7-A**	**02/20/09 10:02**	**Solid**	**Mercury**	**02/20/09**	**02/20/09 20:41**	**090220L06**

-Results are reported on a dry weight basis.

Parameter	Result	RL	DF	Qual	Units
Mercury	1.83	0.0389	1		mg/kg

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
ABM-CS-10-01	**09-02-1922-8-A**	**02/20/09 11:15**	**Solid**	**Mercury**	**02/20/09**	**02/20/09 20:43**	**090220L06**

-Results are reported on a dry weight basis.

Parameter	Result	RL	DF	Qual	Units
Mercury	0.205	0.0336	1		mg/kg

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
ABM-CS-10-02	**09-02-1922-9-A**	**02/20/09 11:15**	**Solid**	**Mercury**	**02/20/09**	**02/20/09 20:46**	**090220L06**

-Results are reported on a dry weight basis.

Parameter	Result	RL	DF	Qual	Units
Mercury	ND	0.0316	1		mg/kg

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
ABM-CS-11-01	**09-02-1922-10-A**	**02/20/09 11:58**	**Solid**	**Mercury**	**02/20/09**	**02/20/09 20:48**	**090220L06**

-Results are reported on a dry weight basis.

Parameter	Result	RL	DF	Qual	Units
Mercury	0.183	0.0349	1		mg/kg

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
ABM-CS-11-02	**09-02-1922-11-A**	**02/20/09 11:58**	**Solid**	**Mercury**	**02/20/09**	**02/20/09 20:50**	**090220L06**

-Results are reported on a dry weight basis.

Parameter	Result	RL	DF	Qual	Units
Mercury	0.299	0.0330	1		mg/kg

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
ABM-CS-12-01	**09-02-1922-12-A**	**02/20/09 12:40**	**Solid**	**Mercury**	**02/20/09**	**02/20/09 20:52**	**090220L06**

-Results are reported on a dry weight basis.

Parameter	Result	RL	DF	Qual	Units
Mercury	0.199	0.0340	1		mg/kg

RL - Reporting Limit , DF - Dilution Factor , Qual - Qualifiers

Calscience Environmental Laboratories, Inc.

Analytical Report

Aquatic Bioassay & Consulting Laboratories
29 North Olive Street
Ventura, CA 93001-2552

Date Received: 02/20/09
Work Order No: 09-02-1922
Preparation: EPA 7471A Total
Method: EPA 7471A

Project: Alamitos Bay Marina Basin

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
ABM-CS-12-02	**09-02-1922-13-A**	**02/20/09 12:40**	**Solid**	**Mercury**	**02/20/09**	**02/20/09 20:54**	**090220L06**

-Results are reported on a dry weight basis.

Parameter	Result	RL	DF	Qual	Units
Mercury	0.288	0.0335	1		mg/kg

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
ABM-CS-12-03	**09-02-1922-14-A**	**02/20/09 12:40**	**Solid**	**Mercury**	**02/20/09**	**02/20/09 20:57**	**090220L06**

-Results are reported on a dry weight basis.

Parameter	Result	RL	DF	Qual	Units
Mercury	0.458	0.0321	1		mg/kg

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
ABM-CS-12-04	**09-02-1922-15-A**	**02/20/09 12:40**	**Solid**	**Mercury**	**02/20/09**	**02/20/09 21:03**	**090220L06**

-Results are reported on a dry weight basis.

Parameter	Result	RL	DF	Qual	Units
Mercury	ND	0.0344	1		mg/kg

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
ABM-CS-12-05	**09-02-1922-16-A**	**02/20/09 12:40**	**Solid**	**Mercury**	**02/20/09**	**02/20/09 21:05**	**090220L06**

-Results are reported on a dry weight basis.

Parameter	Result	RL	DF	Qual	Units
Mercury	ND	0.0333	1		mg/kg

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
ABM-CS-12-06	**09-02-1922-17-A**	**02/20/09 12:40**	**Solid**	**Mercury**	**02/20/09**	**02/20/09 21:08**	**090220L06**

-Results are reported on a dry weight basis.

Parameter	Result	RL	DF	Qual	Units
Mercury	ND	0.0307	1		mg/kg

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
Method Blank	**099-12-452-96**	**N/A**	**Solid**	**Mercury**	**02/20/09**	**02/20/09 20:12**	**090220L06**

Parameter	Result	RL	DF	Qual	Units
Mercury	ND	0.0200	1		mg/kg

RL - Reporting Limit , DF - Dilution Factor , Qual - Qualifiers

Calscience Environmental Laboratories, Inc.

Analytical Report

Aquatic Bioassay & Consulting Laboratories	Date Received: 02/20/09
29 North Olive Street	Work Order No: 09-02-1922
Ventura, CA 93001-2552	Preparation: EPA 7470A Total
	Method: EPA 7470A

Project: Alamitos Bay Marina Basin

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
Rinsate ABM-CS-9	**09-02-1922-18-A**	**02/20/09 10:20**	**Aqueous**	**Mercury**	**02/24/09**	**02/24/09 17:02**	**090224L02B**

Parameter	Result	RL	DF	Qual	Units
Mercury	ND	0.000200	1		mg/L

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
Field blank ABM-CS-9	**09-02-1922-19-A**	**02/20/09 10:20**	**Aqueous**	**Mercury**	**02/24/09**	**02/24/09 17:04**	**090224L02B**

Parameter	Result	RL	DF	Qual	Units
Mercury	ND	0.000200	1		mg/L

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
Method Blank	**099-12-457-128**	**N/A**	**Aqueous**	**Mercury**	**02/24/09**	**02/24/09 16:44**	**090224L02B**

Parameter	Result	RL	DF	Qual	Units
Mercury	ND	0.000200	1		mg/L

RL - Reporting Limit , DF - Dilution Factor , Qual - Qualifiers

Calscience Environmental Laboratories, Inc.

Analytical Report

Aquatic Bioassay & Consulting Laboratories
29 North Olive Street
Ventura, CA 93001-2552

Date Received: 02/20/09
Work Order No: 09-02-1922

Project: Alamitos Bay Marina Basin

Client Sample Number	Lab Sample Number	Date Collected	Matrix
ABM-CS-8-01	**09-02-1922-1**	**02/20/09**	**Solid**

Parameter	Result	RL	DF	Qual	Units	Date Prepared	Date Analyzed	Method
Solids, Total	57.6	0.100	1		%	02/26/09	02/26/09	SM 2540 B

Client Sample Number	Lab Sample Number	Date Collected	Matrix
ABM-CS-8-02	**09-02-1922-2**	**02/20/09**	**Solid**

Parameter	Result	RL	DF	Qual	Units	Date Prepared	Date Analyzed	Method
Solids, Total	60.2	0.100	1		%	02/26/09	02/26/09	SM 2540 B

Client Sample Number	Lab Sample Number	Date Collected	Matrix
ABM-CS-8-03	**09-02-1922-3**	**02/20/09**	**Solid**

Parameter	Result	RL	DF	Qual	Units	Date Prepared	Date Analyzed	Method
Solids, Total	70.9	0.100	1		%	02/26/09	02/26/09	SM 2540 B

Client Sample Number	Lab Sample Number	Date Collected	Matrix
ABM-CS-8-04	**09-02-1922-4**	**02/20/09**	**Solid**

Parameter	Result	RL	DF	Qual	Units	Date Prepared	Date Analyzed	Method
Solids, Total	75.4	0.100	1		%	02/26/09	02/26/09	SM 2540 B

Client Sample Number	Lab Sample Number	Date Collected	Matrix
ABM-CS-9-01	**09-02-1922-5**	**02/20/09**	**Solid**

Parameter	Result	RL	DF	Qual	Units	Date Prepared	Date Analyzed	Method
Solids, Total	46.8	0.100	1		%	02/26/09	02/26/09	SM 2540 B

RL - Reporting Limit , DF - Dilution Factor , Qual - Qualifiers

Calscience Environmental Laboratories, Inc.

Analytical Report

Aquatic Bioassay & Consulting Laboratories
29 North Olive Street
Ventura, CA 93001-2552

Date Received: 02/20/09
Work Order No: 09-02-1922

Project: Alamitos Bay Marina Basin

Client Sample Number	Lab Sample Number	Date Collected	Matrix
ABM-CS-9-02	**09-02-1922-6**	**02/20/09**	**Solid**

Parameter	Result	RL	DF	Qual	Units	Date Prepared	Date Analyzed	Method
Solids, Total	55.8	0.100	1		%	02/26/09	02/26/09	SM 2540 B

Client Sample Number	Lab Sample Number	Date Collected	Matrix
ABM-CS-9-03	**09-02-1922-7**	**02/20/09**	**Solid**

Parameter	Result	RL	DF	Qual	Units	Date Prepared	Date Analyzed	Method
Solids, Total	51.5	0.100	1		%	02/26/09	02/26/09	SM 2540 B

Client Sample Number	Lab Sample Number	Date Collected	Matrix
ABM-CS-10-01	**09-02-1922-8**	**02/20/09**	**Solid**

Parameter	Result	RL	DF	Qual	Units	Date Prepared	Date Analyzed	Method
Solids, Total	59.7	0.100	1		%	02/26/09	02/26/09	SM 2540 B

Client Sample Number	Lab Sample Number	Date Collected	Matrix
ABM-CS-10-02	**09-02-1922-9**	**02/20/09**	**Solid**

Parameter	Result	RL	DF	Qual	Units	Date Prepared	Date Analyzed	Method
Solids, Total	63.4	0.100	1		%	02/26/09	02/26/09	SM 2540 B

Client Sample Number	Lab Sample Number	Date Collected	Matrix
ABM-CS-11-01	**09-02-1922-10**	**02/20/09**	**Solid**

Parameter	Result	RL	DF	Qual	Units	Date Prepared	Date Analyzed	Method
Solids, Total	57.5	0.100	1		%	02/26/09	02/26/09	SM 2540 B

RL - Reporting Limit , DF - Dilution Factor , Qual - Qualifiers

Calscience Environmental Laboratories, Inc.

Analytical Report

Aquatic Bioassay & Consulting Laboratories
29 North Olive Street
Ventura, CA 93001-2552

Date Received: 02/20/09
Work Order No: 09-02-1922

Project: Alamitos Bay Marina Basin

Client Sample Number	Lab Sample Number	Date Collected	Matrix
ABM-CS-11-02	**09-02-1922-11**	**02/20/09**	**Solid**

Parameter	Result	RL	DF	Qual	Units	Date Prepared	Date Analyzed	Method
Solids, Total	60.8	0.100	1		%	02/26/09	02/26/09	SM 2540 B

Client Sample Number	Lab Sample Number	Date Collected	Matrix
ABM-CS-12-01	**09-02-1922-12**	**02/20/09**	**Solid**

Parameter	Result	RL	DF	Qual	Units	Date Prepared	Date Analyzed	Method
Solids, Total	58.9	0.100	1		%	02/26/09	02/26/09	SM 2540 B

Client Sample Number	Lab Sample Number	Date Collected	Matrix
ABM-CS-12-02	**09-02-1922-13**	**02/20/09**	**Solid**

Parameter	Result	RL	DF	Qual	Units	Date Prepared	Date Analyzed	Method
Solids, Total	59.8	0.100	1		%	02/26/09	02/26/09	SM 2540 B

Client Sample Number	Lab Sample Number	Date Collected	Matrix
ABM-CS-12-03	**09-02-1922-14**	**02/20/09**	**Solid**

Parameter	Result	RL	DF	Qual	Units	Date Prepared	Date Analyzed	Method
Solids, Total	62.4	0.100	1		%	02/26/09	02/26/09	SM 2540 B

Client Sample Number	Lab Sample Number	Date Collected	Matrix
ABM-CS-12-04	**09-02-1922-15**	**02/20/09**	**Solid**

Parameter	Result	RL	DF	Qual	Units	Date Prepared	Date Analyzed	Method
Solids, Total	58.2	0.100	1		%	02/26/09	02/26/09	SM 2540 B

RL - Reporting Limit , DF - Dilution Factor , Qual - Qualifiers

Calscience Environmental Laboratories, Inc.

Analytical Report

Aquatic Bioassay & Consulting Laboratories
29 North Olive Street
Ventura, CA 93001-2552

Date Received: 02/20/09
Work Order No: 09-02-1922

Project: Alamitos Bay Marina Basin

Client Sample Number	Lab Sample Number	Date Collected	Matrix
ABM-CS-12-05	**09-02-1922-16**	**02/20/09**	**Solid**

Parameter	Result	RL	DF	Qual	Units	Date Prepared	Date Analyzed	Method
Solids, Total	60.2	0.100	1		%	02/26/09	02/26/09	SM 2540 B

Client Sample Number	Lab Sample Number	Date Collected	Matrix
ABM-CS-12-06	**09-02-1922-17**	**02/20/09**	**Solid**

Parameter	Result	RL	DF	Qual	Units	Date Prepared	Date Analyzed	Method
Solids, Total	65.3	0.100	1		%	02/26/09	02/26/09	SM 2540 B

Client Sample Number	Lab Sample Number	Date Collected	Matrix
Method Blank		**N/A**	**Solid**

Parameter	Result	RL	DF	Qual	Units	Date Prepared	Date Analyzed	Method
Solids, Total	ND	0.100	1		%	02/26/09	02/26/09	SM 2540 B

RL - Reporting Limit , DF - Dilution Factor , Qual - Qualifiers

Calscience Environmental Laboratories, Inc.

Quality Control - Spike/Spike Duplicate

Aquatic Bioassay & Consulting Laboratories
29 North Olive Street
Ventura, CA 93001-2552

Date Received: 02/20/09
Work Order No: 09-02-1922
Preparation: EPA 7471A Total
Method: EPA 7471A

Project Alamitos Bay Marina Basin

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	MS/MSD Batch Number
ABM-CS-8-01	**Solid**	**Mercury**	**02/20/09**	**02/20/09**	**090220S06**

Parameter	MS %REC	MSD %REC	%REC CL	RPD	RPD CL	Qualifiers
Mercury	114	100	76-136	6	0-16	

RPD - Relative Percent Difference , CL - Control Limit

Calscience Environmental Laboratories, Inc.

Quality Control - Spike/Spike Duplicate

Aquatic Bioassay & Consulting Laboratories
29 North Olive Street
Ventura, CA 93001-2552

Date Received: 02/20/09
Work Order No: 09-02-1922
Preparation: EPA 7470A Total
Method: EPA 7470A

Project Alamitos Bay Marina Basin

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	MS/MSD Batch Number
09-02-2053-1	**Aqueous**	**Mercury**	**02/24/09**	**02/24/09**	**090224S02**

Parameter	MS %REC	MSD %REC	%REC CL	RPD	RPD CL	Qualifiers
Mercury	91	91	66-126	1	0-7	

RPD - Relative Percent Difference , CL - Control Limit

Calscience Environmental Laboratories, Inc.

Quality Control - Duplicate

Aquatic Bioassay & Consulting Laboratories
29 North Olive Street
Ventura, CA 93001-2552

Date Received: N/A
Work Order No: 09-02-1922

Project: Alamitos Bay Marina Basin

Matrix: Solid

Parameter	Method	QC Sample ID	Date Analyzed	Sample Conc	DUP Conc	RPD	RPD CL	Qualifiers
Solids, Total	SM 2540 B	ABM-CS-8-01	02/26/09	57.6	58.7	2	0-25	

RPD - Relative Percent Difference , CL - Control Limit

Calscience Environmental Laboratories, Inc.

Quality Control - LCS/LCS Duplicate

Aquatic Bioassay & Consulting Laboratories
29 North Olive Street
Ventura, CA 93001-2552

Date Received: N/A
Work Order No: 09-02-1922
Preparation: EPA 7471A Total
Method: EPA 7471A

Project: Alamitos Bay Marina Basin

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number
099-12-452-96	**Solid**	**Mercury**	**02/20/09**	**02/20/09**	**090220L06**

Parameter	LCS %REC	LCSD %REC	%REC CL	RPD	RPD CL	Qualifiers
Mercury	97	97	82-124	0	0-16	

RPD - Relative Percent Difference , CL - Control Limit

Calscience Environmental Laboratories, Inc.

Quality Control - LCS/LCS Duplicate

Aquatic Bioassay & Consulting Laboratories
29 North Olive Street
Ventura, CA 93001-2552

Date Received: N/A
Work Order No: 09-02-1922
Preparation: EPA 7470A Total
Method: EPA 7470A

Project: Alamitos Bay Marina Basin

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number
099-12-457-128	**Aqueous**	**Mercury**	**02/24/09**	**02/24/09**	**090224L02B**

Parameter	LCS %REC	LCSD %REC	%REC CL	RPD	RPD CL	Qualifiers
Mercury	93	94	90-122	1	0-14	

RPD - Relative Percent Difference , CL - Control Limit

Calscience Environmental Laboratories, Inc.

Glossary of Terms and Qualifiers

Work Order Number: 09-02-1922

Qualifier	Definition
*	See applicable analysis comment.
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 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 with no further corrective action required.
A	Result is the average of all dilutions, as defined by the method.
B	Analyte was present in the associated method blank.
C	Analyte presence was not confirmed on primary column.
E	Concentration exceeds the calibration range.
H	Sample received and/or analyzed past the recommended holding time.
J	Analyte was detected at a concentration below the reporting limit and above the laboratory method detection limit. Reported value is estimated.
ME	LCS Recovery Percentage is within LCS ME Control Limit range.
N	Nontarget Analyte.
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.
U	Undetected at the laboratory method detection limit.
X	% Recovery and/or RPD out-of-range.
Z	Analyte presence was not confirmed by second column or GC/MS analysis.

Calscience Environmental Laboratories, Inc.

☐ SoCal Laboratory
7440 Lincoln Way
Garden Grove, CA 92841-1427
(714) 895-5494

☐ NorCal Service Center
5063 Commercial Circle, Suite H
Concord, CA 94520-8577
(925) 689-9022

CHAIN OF CUSTODY RECORD

Date 2·20·09

LABORATORY CLIENT: ABC Laboratories

ADDRESS: 29 N. Olive Street

CITY: Ventura STATE: CA ZIP: 93001

TEL: 805-643-5621 x11 E-MAIL: Scott@aquabio.org

TURNAROUND TIME: ☐ SAME DAY ☐ 24 HR ☐ 48 HR ☐ 72 HR ☒ STANDARD

SPECIAL REQUIREMENTS (ADDITIONAL COSTS MAY APPLY)
☐ RWQCB REPORTING FORMS ☐ COELT EDF ☒ Equis & edd

SPECIAL INSTRUCTIONS:

CLIENT PROJECT NAME / NUMBER: Alamitos Bay Marina Basin 1

P.O. NO.:

PROJECT CONTACT: Scott Johnson

LAB USE ONLY: 0 2 - 1 9 2 2

SAMPLER(S): (PRINT) Jim Mann

COELT LOG CODE

COOLER RECEIPT TEMP= °C

REQUESTED ANALYSES

LAB USE ONLY	SAMPLE ID	FIELD POINT NAME (FOR COELT EDF)	SAMPLING DATE	SAMPLING TIME	MATRIX	NO. OF CONT.	TPH (g)	TPH (d) or (C6-C36) or (C6-C44)	TPH ( )	BTEX / MTBE (8260B) or ( )	VOCs (8260B)	Oxygenates (8260B)	Encore Prep (5035)	SVOCs (8270C)	Pesticides (8081A)	PCBs (8082)	PNAs (8310) or (8270C)	T22 Metals (6010B/747X)	Cr(VI) [7196A or 7199 or 218.6]	VOCs (TO-14A) or (TO-15)	TPH (g) [TO-3]+	Mercury 7471A		
1	ABM-CS-8-01		2·20·09	0845	Sed	1																X		
2	ABM-CS-8-02		2·20·09	0845																		X		
3	ABM-CS-8-03		2·20·09	0845																		X		
4	ABM-CS-8-04		2·20·09	0845																		X		
5	ABM-CS-9-01		2·20·09	1002																		X		
6	ABM-CS-9-02		2·20·09	1002																		X		
7	ABM-CS-9-03		2·20·09	1002																		X		
8	ABM-CS-10-01		2·20·09	1115																		X		
9	ABM-CS-10-02		2·20·09	1115																		X		
10	ABM-CS-11-01		2·20·09	11:58	↓	↓																X		

Relinquished by: (Signature)	Received by: (Signature/Affiliation) bannyle CEL	Date: 2·20·09	Time: 13:43 (DLC)
Relinquished by: (Signature)	Received by: (Signature/Affiliation)	Date:	Time: 13:43
Relinquished by: (Signature)	Received by: (Signature/Affiliation)	Date:	Time:

DISTRIBUTION: White with final report, Green and Yellow to Client.
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05/01/07 Revision

Calscience Environmental Laboratories, Inc.

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(714) 895-5494

☐ NorCal Service Center
5063 Commercial Circle, Suite H
Concord, CA 94520-8577
(925) 689-9022

CHAIN OF CUSTODY RECORD

Date 2-20-09

LABORATORY CLIENT: ABC Laboratories	CLIENT PROJECT NAME / NUMBER: Alamitos Bay Marina Basin 1
ADDRESS: 29 N. Olive Street	PROJECT CONTACT: Scott Johnson
CITY: Ventura STATE: CA ZIP: 93001	SAMPLER(S): (PRINT) Jim Mann
TEL: 805-643-5621 x11 E-MAIL: Scott@aquabio.org	COELT LOG CODE: ☐☐☐☐
TURNAROUND TIME: ☐ SAME DAY ☐ 24 HR ☐ 48 HR ☐ 72 HR ☒ STANDARD	P.O. NO.:
SPECIAL REQUIREMENTS (ADDITIONAL COSTS MAY APPLY) ☐ RWQCB REPORTING FORMS ☐ COELT EDF ☒ Equis edd	LAB USE ONLY: 02-1922
SPECIAL INSTRUCTIONS:	COOLER RECEIPT TEMP= °C

REQUESTED ANALYSES

LAB USE ONLY	SAMPLE ID	FIELD POINT NAME (FOR COELT EDF)	SAMPLING DATE	SAMPLING TIME	MATRIX	NO. OF CONT.	TPH (g)	TPH (d) or (C6-C36) or (C6-C44)	TPH ( )	BTEX / MTBE (8260B) or ( )	VOCs (8260B)	Oxygenates (8260B)	Encore Prep (5035)	SVOCs (8270C)	Pesticides (8081A)	PCBs (8082)	PNAs (8310) or (8270C)	T22 Metals (6010B/747X)	Cr(VI) [7196A or 7199 or 218.6]	VOCs (TO-14A) or (TO-15)	TPH (g) [TO-3]+	Mercury 7471A		
11	ABM-CS-11-02		2-20-09	1158	Sed	1																X		
12	ABM-CS-12-01		2-20-09	1240	Sed																	X		
13	ABM-CS-12-02		2-20-09	1240	Sed																	X		
14	ABM-CS-12-03		2-20-09	1240	Sed																	X		
15	ABM-CS-12-04		2-20-09	1240	Sed																	X		
16	ABM-CS-12-05		2-20-09	1240	Sed																	X		
17	ABM-CS-12-06		2-20-09	1240	Sed																	X		

Relinquished by: (Signature)	Received by: (Signature/Affiliation) Danny Le CEL	Date: 2-20-09	Time: 13:43
Relinquished by: (Signature)	Received by: (Signature/Affiliation)	Date:	Time:
Relinquished by: (Signature)	Received by: (Signature/Affiliation)	Date:	Time:

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CHAIN OF CUSTODY RECORD

Date 2·20·09

LABORATORY CLIENT: ABC Laboratories

ADDRESS: 29 N. Olive Street

CITY: Ventura STATE: CA ZIP: 93001

TEL: 805-643-5621 x11 E-MAIL:

CLIENT PROJECT NAME / NUMBER: Alamitos Bay Marina Basin 1

P.O. NO.:

PROJECT CONTACT: Scott Johnson

LAB USE ONLY: 02-1922

SAMPLER(S): (PRINT) Jim Mann

COELT LOG CODE: ☐☐☐☐

COOLER RECEIPT TEMP= °C

TURNAROUND TIME:
☐ SAME DAY ☐ 24 HR ☐ 48 HR ☐ 72 HR ☒ STANDARD

SPECIAL REQUIREMENTS (ADDITIONAL COSTS MAY APPLY)
☐ RWQCB REPORTING FORMS ☐ COELT EDF ☒ E

SPECIAL INSTRUCTIONS:

REQUESTED ANALYSES

LAB USE ONLY	SAMPLE ID	FIELD POINT NAME (FOR COELT EDF)	SAMPLING DATE	SAMPLING TIME	MATRIX	NO. OF CONT.	TPH (g)	TPH (d) or (C6-C36) or (C6-C44)	TPH ( )	BTEX / MTBE (8260B) or ( )	VOCs (8260B)	Oxygenates (8260B)	Encore Prep (5035)	SVOCs (8270C)	Pesticides (8081A)	PCBs (8082)	PNAs (8310) or (8270C)	T22 Metals (6010B/747X)	Cr(VI) [7196A or 7199 or 218.6]	VOCs (TO-14A) or (TO-15)	TPH (g) [TO-3]+			
18	Rinsate ABM-CS-9		9·20·09	1020	Water	1																		
19	Fuld blank ABM-CS-9		9·20·09	1020	Water	"																		

Relinquished by: (Signature)	Received by: (Signature/Affiliation) Danny Le CEL	Date: 2·20·09	Time: 13:43
Relinquished by: (Signature)	Received by: (Signature/Affiliation)	Date:	Time:
Relinquished by: (Signature)	Received by: (Signature/Affiliation)	Date:	Time:

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05/01/07 Revision

Calscience Environmental Laboratories, Inc.

WORK ORDER #: 09-02-1922

SAMPLE RECEIPT FORM

Cooler 1 of 1

CLIENT: ABC Labs. DATE: 02/20/09

TEMPERATURE: (Criteria: 0.0 °C – 6.0 °C, not frozen)

Temperature 2.5 °C - 0.2 °C (CF) = 2.3 °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 ☐ Metals Only ☐ PCBs Only **Initial:** DL

CUSTODY SEALS INTACT:

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

☐ Sample ☐_____ ☐ No (Not Intact) ☑ Not Present **Initial:** W.S.C

SAMPLE CONDITION:	Yes	No	N/A
Chain-Of-Custody (COC) document(s) received with samples.....	☑	☐	☐
COC document(s) received complete.....	☐	☑	☐
Sampler's name indicated on COC.....	☑	☐	☐
Sample container label(s) consistent with COC.....	☑	☐	☐
Sample container(s) intact and good condition.....	☑	☐	☐
Correct containers and volume for analyses requested.....	☑	☐	☐
Analyses received within holding time.....	☑	☐	☐
Proper preservation noted on COC or sample container.....	☑	☐	☐
Volatile analysis container(s) free of headspace.....	☐	☐	☑
Tedlar bag(s) free of condensation.....	☐	☐	☑

CONTAINER TYPE:

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

Water: ☐VOA ☐VOAh ☐VOAna_2 ☐125AGB ☐125AGBh ☐125AGBpo_4 ☐1AGB ☐1AGBna_2 ☐1AGBs ☐500AGB ☐500AGBs ☐250CGB ☐250CGBs ☐1PB ☐500PB ☐500PBna ☐250PB ☑250PBn ☐125PB ☐125PBznna ☐100PBsterile ☐100PBna_2 ☐_____ ☐_____ ☐_____

Air: ☐Tedlar® ☐Summa® ☐_____

Checked/Labeled by: W.S.C

Reviewed by: NL

Scanned by: W.S.C

Container: C:Clear A:Amber P:Poly/Plastic G:Glass J:Jar B:Bottle

Preservative: h:HCL n:HNO_3 na_2:$Na_2S_2O_3$ na:NaOH po_4:H_3PO_4 s:H_2SO_4 znna:$ZnAc_2$+NaOH

Calscience Environmental Laboratories, Inc.

WORK ORDER #: 09-02-1912

SAMPLE ANOMALY FORM

CHAIN OF CUSTODY (COC):

- ☐ **Not relinquished by client – no signature**
- ☐ **No date/time relinquished**
- ☐ **COC not received with samples** – notify PM
- ☑ **Incomplete information regarding samples, tests, etc.**

Comments:

(-18) + (-19) no analyses requested.

SAMPLES - CONTAINERS & LABELS:

Comments:

- ☐ **Samples NOT RECEIVED but listed on COC**
- ☐ **Samples 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
- ☐ **No preservative noted on COC or label** – list test & notify lab
- ☐ **Sample labels illegible** – note test/container type
- ☐ **Sample labels do not match COC** – Note in comments
  - ☐ **Sample ID**
  - ☐ **Date and/or Time Collected**
  - ☐ **Project Information**
  - ☐ **# of containers**
- ☐ **Sample containers compromised** – Note in comments
  - ☐ **Leaking**
  - ☐ **Broken**
  - ☐ **Without Labels**
- ☐ **Other:** _____

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 RSK or CO_2 or DO or Organic Lead Received

Comments: _____

Initial / Date LSC. 2-20-09

BEST MANAGEMENT PRACTICES

BEST MANAGEMENT PRACTICES

Best Management Practices (BMP) are the actual practices--including the forms, procedures, charts, software references, etc.--actually used by dredgers to minimize consequences of dredging and disposal on water quality. Common BMPs include Silt Curtains, Gunderbooms, and Operational Controls.

SILT CURTAINS

Silt curtains are intended to allow suspended sediment at a dredging site to settle out of the water column in a controlled area, minimizing the area that is affected by the increased suspended sediment usually present at a dredging site. A silt curtain is an impermeable barrier. They are constructed of a flexible reinforced thermoplastic material. The upper hem has floatation material and the lower hem has ballast material. Silt curtains are most effective when used on a project where they are not opened and closed to allow equipment access to the dredging or disposal area. Silt curtains are also limited to project locations with less than 1-2 knot currents.

GUNDERBOOMS

Gunderbooms are designed to allow water to flow through the curtain while filtering suspended dredged sediment from the flow. Gunderbooms are similar to silt curtains but are constructed of permeable geotextile fabrics. They are also designed to extend from the water surface to the project bottom.

MECHANICAL DREDGE OPERATIONAL CONTROLS

There are three fundamental controls possible with mechanical dredges.

- **Increase cycle time.** Longer cycle time reduces the velocity of the ascending loaded bucketthrough the water column, which reduces potential to wash sediment form the bucket. However, limiting the velocity of the descending bucket reduces the volume of sediment that is picked up and requires more total bites to remove the project material. The majority of the sediment resuspension, for a clamshell dredge, occurs when the bucket hits the bottom.

- **Eliminate multiple bites.** When the clamshell bucket hits the bottom, an impact wave of suspended sediment travels along the bottom away form the dredge bucket. When the clamshell bucket takes multiple bites, the bucket loses sediment as it is reopened for subsequent bites. Sediment is also released higher in the water column, as the bucket is raised, opened, and lowered.

· **Eliminate bottom stockpiling.** Bottom stockpiling of the dredged sediment in silty sediment has a similar effect as multiple bite dredging; an increased volume of sediment is released into the water column from the operation.

HYDRAULIC DREDGE OPERATIONAL CONTROLS

There are three fundamental controls possible with hydraulic dredges.

· **Reduce cutterhead rotation speed.** Reducing cutterhead rotation speed reduces the potential for side casting the excavated sediment away form the suction entrance and resuspending sediment. This measure is typically effective only on maintenance or relatively loose, fine grain sediment.

· **Reduce swing speed.** Reducing the swing speed ensures that the dredge head does not move through the cut faster than it can hydraulically pump the sediment. Reducing swing speed reduces the volume of resuspended sediment. The goal is to swing the dredge head at a speed that allows as much of the disturbed sediment as possible to be removed with the hydraulic flow. Typical swing speeds are 5-30 feet/minute.

· **Eliminate bank undercutting.** Dredgers should remove the sediment in maximum lifts equal to 80% or less of the cutterhead diameter.

HOPPER DREDGES AND BARGES OPERATIONAL CONTROLS

There are three controls possible with dredges and barges.

· **Eliminate or reduce hopper overflow.** Eliminating or reducing hopper overflow reduces the volume of fine material which flows from the hopper in the overflow. One caution is that this control may significantly reduce project production for hopper dredges or when hydraulic dredging into a barge.

· **Lower hopper fill level.** Lowering the hopper fill level in rough sea conditions can prevent material loss during transport.

· **Recirculation system.** Water from the hopper overflow can be recirculated to the draghead and is used to transport more material into the hopper.

SPECIALTY EQUIPMENT

· **Pneuma Pump.** The Pneuma pump is used primarily for removal of fine-grained sediment. The Pneuma pump offers high solids concentration (up to 90%) in the dredge slurry, with minimal turbidity.