

Western Operations

1252 Quarry Lane
P.O. Box 9019
Pleasanton, CA 94566
(510) 426-2600
Fax (510) 426-0106

Clayton
ENVIRONMENTAL
CONSULTANTS

451-5916
-Diane Heinz

Soil Investigation
of
Former Cryer Boat Yard
at
1899 Dennison Street
Oakland, California
for
Port of Oakland

Clayton Project No. 58560.25
May 22, 1995

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Pleasanton, CA 94566
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Clayton
ENVIRONMENTAL
CONSULTANTS

May 25, 1995

Mr. Dan Schoenholz
PORT OF OAKLAND
530 Water Street, 5th Floor
Oakland, CA 94607

Clayton Project No. 58560.25

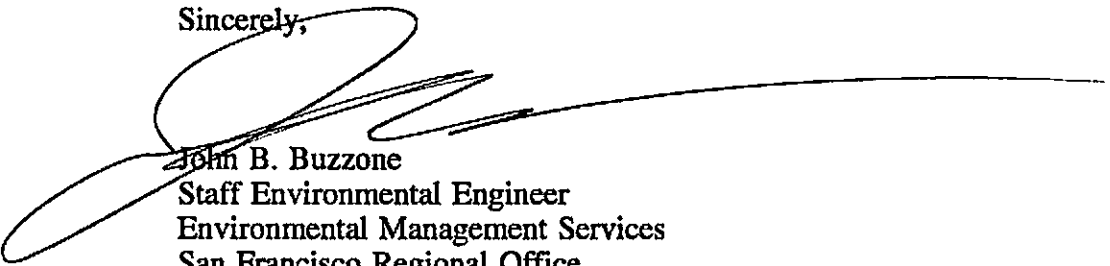
Subject: Soil Investigation at the Former Cryer Boat Yard

Dear Mr. Schoenholz:

Clayton Environmental Consultants, Inc. is pleased to present our report of the soil investigation we conducted at the Former Cryer Boat Yard at 1899 Dennison Street in Oakland, California.

If you have any questions or need additional information, please call me at (510) 426-2664.

Sincerely,



John B. Buzzone
Staff Environmental Engineer
Environmental Management Services
San Francisco Regional Office

JBB/jbb

ACTIVE5856025L.145]

Clayton Environmental Consultants, Inc. • Detroit • New York/Newark • Atlanta • San Francisco • Los Angeles
Honolulu • Windsor, ON • Toronto • Birmingham, U.K. • London, U.K. • Southampton, U.K. • Gateshead, U.K.

Executive Summary

On January 5, 1995, Clayton Environmental Consultants, Inc. conducted a Phase I Environmental Site Assessment of the Former Cryer Boat Yard located at 1899 Dennison Street in Oakland, California (Clayton Report No. 58560.14 dated January 19, 1995). The assessment identified paint fragments on the site's soil and staining on the concrete floor of the winch-house located on the property. These conditions indicated that the soils at the site may have been contaminated.

On March 30, 1995, Clayton conducted a Phase II investigation at the site to investigate the possibility of soil contamination that may have originated from conditions observed during the Phase I Environmental Site Assessment.

The investigation consisted of collecting soil samples from eight locations on the property. The soil samples were analyzed for total petroleum hydrocarbons as diesel (TPH-D) and/or 17 California Title 22 Metals, for comparison to their respective Total Threshold Limit Concentration (TTLC).

The analytical results indicate that soils at the site have been contaminated by TPH-D, copper, lead, and mercury. According to the analytical report, however, the petroleum hydrocarbons found in the samples more closely match motor oil than diesel. The TPH-D contamination was found beneath the winch-house, beneath the western end of the building that extends onto the site from the adjacent property, and at the southwest portion of the property. At these three locations, the concentrations exceed the guidance threshold established by the Alameda County Health Care Services Agency. *what is?*

*RCR?
hazardous*

The metal contamination appears to be primarily limited to the surface soils at the site. The metal concentrations of some of the soil samples collected at the site are high enough to classify the soils as a hazardous waste.

Clayton recommends that additional investigation be conducted at the site to determine the lateral and vertical extent of the metal and TPH-D contamination of the soils at the site. Once the extent and magnitude of the contamination has been identified, we recommend that a remedial action plan be developed and implemented.

1.0 INTRODUCTION

On January 5, 1995, Clayton Environmental Consultants, Inc. conducted a Phase I Environmental Assessment of the Former Cryer Boat Yard located at 1899 Dennison Street in Oakland, California (Clayton Report No. 58560.14 dated January 19, 1995). The assessment identified paint fragments on the site's soil. The assessment also identified staining on the soil and concrete floor of the winch-house located on the property. These conditions indicated there was a possibility of soil contamination at the site.

The Port of Oakland retained Clayton to conduct a Phase II Environmental Assessment of the Former Cryer Boat Yard located at 1899 Dennison Street in Oakland, California (Figure 1). The work was authorized by Mr. Neil Werner, Supervisor with the Port of Oakland, on March 17, 1995, by accepting the scope of work and estimated fees presented in Clayton's proposal 95-B-086 to Mr. Dan Schoenholz, dated March 8, 1995.

1.1 SITE DESCRIPTION

The site was formerly leased to the Cryer Boat Yard Company and was utilized as a small boat repair facility. The 1.8 acre site consists of eight buildings, two dry dock rails, and one wharf. The site is located on the waterfront of the Oakland Inner Harbor.

2.0 SCOPE OF WORK

Clayton performed two tasks: soil sampling and sample analysis. Each task is described in the following sections.

2.1 SOIL SAMPLE COLLECTION

Clayton installed eight boreholes (SB-1 through SB-8) at the site by power- and/or hand-augering. Figure 2 shows the borehole locations. Borings SB-1, SB-2, and SB-3 were installed in an area of the property that had a high concentration of visible paint fragments littering the soils. Soil samples were collected from borings SB-1, SB-2, and SB-3 at the surface and at 2.5 feet below ground surface (bgs) to determine the vertical migration of suspected metals in the soils. Groundwater was encountered at approximately 3 feet bgs at SB-3.

Boring SB-4 was located in an area of the property that did not have paint fragments littering the surface soils and was not suspected of having elevated metal concentrations. Thus, SB-4 was chosen to verify background metal concentrations of the site's soils. The groundwater was estimated to be at approximately 5- to 6 feet bgs, thus Clayton collected one soil sample at approximately 4 feet bgs from SB-4.

The Phase I Environmental Site Assessment report incorrectly identified the floor of the winch-house as being both bare soil, and concrete. The floor was actually a solid concrete slab. Clayton installed borings SB-5 and SB-6 at an angle so that they extended beneath the winch-house's solid concrete floor. Soil samples SB-5@1.5 and

SB-6@1.5 were collected at approximately 1.5 feet bgs and approximately 2 feet from the outside edge of the concrete floor. Clayton encountered groundwater in SB-6 at approximately 2 feet bgs.

One surface soil sample was collected at SB-7 to evaluate the potential of contamination that may have originated from the building located above SB-7.

Boring SB-8 was located in an area of the property that did not have visible paint fragments littering the surface soils and was not suspected of having elevated metal concentrations. Boring SB-4 was chosen to verify the background metal concentration of the site's soils. Based on our previous borings at the site, Clayton estimated the depth to groundwater to be approximately 4- to 5 feet bgs, thus Clayton collected a soil sample SB-8@3.5 at approximately 3.5 feet bgs.

All soil borings were backfilled with the excavated soil. The soil samples were collected in pre-cleaned brass tubes and capped with teflon and plastic end caps. The sampling equipment was washed and rinsed after each sampling. The soil samples were stored in a chilled cooler and transported to Clayton's state certified laboratory under strict chain-of-custody procedures.

2.2 ANALYSIS OF SOIL SAMPLES

Clayton analyzed the soil samples for 17 California Title 22 Metals, by USEPA Methods 6000 and 7000 series for comparison to Total Threshold Limit Concentration (TTLIC) values. Additionally, Clayton analyzed the soil samples from areas that were suspected of being contaminated with petroleum for total petroleum hydrocarbons as diesel (TPH-D) using United States Environmental Protection Agency (USEPA) Method 8015, modified.

3.0 RESULTS

Detectable concentrations of TPH-D and metals were identified in the soil samples. A table summarizing the analytical results can be found in Appendix 1 (please note that the analytical report, Appendix 2, incorrectly identifies the surface soil samples as SB-X@5' instead of the correct SB-X@S). Elevated levels (greater than 100 milligrams per kilogram (mg/kg)) of TPH-D were found in soil samples SB-3@2.5 (460 mg/kg), SB-5@1.5 (530 mg/kg), SB-6@1.5 (240), and SB-7@S (360 mg/kg). The laboratory report indicates that the petroleum hydrocarbons identified in these samples more closely match motor oil than diesel.

Elevated concentrations of copper, lead, and/or mercury were also found in soil samples collected at the site. Soil sample SB-1@S was found to contain 3,900 mg/kg of copper, 530 mg/kg of lead, and 2.3 mg/kg mercury. Soil sample SB-2@S was found to contain 9,100 mg/kg of copper, 230 mg/kg of lead, and 2.1 mg/kg of mercury. Soil sample SB-2@2.5 was found to contain 59 mg/kg of lead. Soil sample SB-3@S was found to contain 3,100 mg/kg of copper and 520 mg/kg of lead. Soil sample SB-3@2.5 was found to contain 1,300 mg/kg of copper and 300 mg/kg of lead. Soil sample SB-6@1.5 was found to contain 1,100 mg/kg of copper, 220 mg/kg

of lead, and 20 mg/kg of mercury. Soil sample SB-7@S was found to contain 6,500 mg/kg of copper, 720 mg/kg of lead, and 25 mg/kg of mercury. Soil sample SB-8@3.5 was found to contain 280 mg/kg of lead. Appendix 1 shows the individual metal concentrations for each soil sample.

The California Department of Toxic Substances Control (DTSC) has established regulatory thresholds for specific metals, identified as the Total Threshold Limit Concentration (TTLC) and the Soluble Threshold Limit Concentration (STLC), above which, a solid waste is considered a hazardous waste for disposal purposes. The TTLC for copper is 2,500 mg/kg. The TTLC for lead is 1,000 mg/kg. The TTLC for mercury is 20 mg/kg. Additionally, the DTSC has established the Soluble Threshold Limit Concentration (STLC) for solids containing metals. The STLC for copper is 25 milligrams per liter (mg/L), the STLC for lead is 5 mg/L, the STLC for mercury is 0.2 mg/L.

The STLC for a soil sample can be conservatively estimated (giving the highest possible STLC) from the TTLC results by assuming all of the metal in the sample will be leached out of the sample during the extraction step, and that the solution is diluted by a factor of ten. This suggests that the maximum possible soluble concentration for a soil sample would be one tenth of the soil sample's TTLC result for any given metal.

4.0 CONCLUSIONS

The results indicate that the soils beneath the winch-house have been impacted by TPH-D, which likely originated from the winch and is probably motor oil and not diesel. The TPH-D concentrations in the soil samples collected from beneath the winch-house are in excess of the guidance threshold for TPH-D concentrations (100 mg/kg) used by Alameda County Health Care Services Agency (ACHCSA) (per the Tri-Regional Board guidelines). Soil sample SB-6@1.5 also contained elevated concentrations of copper, lead, and mercury (1,100 mg/kg, 220 mg/kg, and 20 mg/kg, respectively). The copper and lead concentrations are below the TTLC that the DTSC has established for classification as a hazardous waste. However, the soil sample could potentially have soluble copper and lead concentrations that exceed the DTSC's STLC for classification as a hazardous waste. The sample contained 20 mg/kg of mercury, equivalent to the DTSC's TTLC for classification as a California hazardous waste.

While the source of metal contamination in soil samples from SB-5 and SB-6 was not readily identifiable (no paint fragments were observed in the soil samples, nor on the immediately surrounding soils), Clayton suspects that the metals came from boat repair and servicing activities that appear to have been conducted in the general vicinity. Soil samples SB-5@1.5 and SB-6@1.5 do not provide enough information to fully estimate the lateral extent of the TPH-D soil contamination in the winch-house area. Since the groundwater is shallow (approximately 2 feet bgs), the vertical extent of the contamination of the TPH-D is expected to be no more than four to five feet deep.

Soil sample SB-7@S contained TPH-D concentrations that are in excess of the ACHCSA's guidance threshold. This soil sample also contained 6,500 mg/kg of copper and 25 mg/kg of mercury, which exceeds the regulatory thresholds for classification as a California hazardous waste. The soil sample contained 720 mg/kg of lead. This is below the TTLC for lead, but high enough to indicate that the sample may have soluble lead in excess of the STLC.

Soil sample SB-7@S was collected from beneath the building, where boats appear to be serviced and repaired. This building is currently occupied by the operators of the adjacent property. Clayton could not positively identify the source of contamination during the Phase I Environmental Assessment, nor during the soil sampling, except that there appeared to be boat servicing and repair activities in the building immediately above SB-7 that could generate the contaminants. At present, there is not enough information to determine the lateral and vertical extent of the soil contamination beneath the building.

Soil samples collected from the surface at SB-1, SB-2, and SB-3 contained copper concentrations in excess of the TTLC for classification as a California hazardous waste. These soil samples also contained lead in a high enough concentration to indicate that the samples could potentially have soluble lead concentrations that exceed the STLC for classification as a hazardous waste. Surface soil samples from SB-1 and SB-2 contained mercury in high enough concentrations to indicate that the samples could potentially have soluble mercury concentrations that exceed the STLC for classification as a hazardous waste. Soil sample SB-3@2.5 contained TPH-D that is in excess of the ACHCSA's guidance threshold. The source of the TPH-D was not readily identifiable.

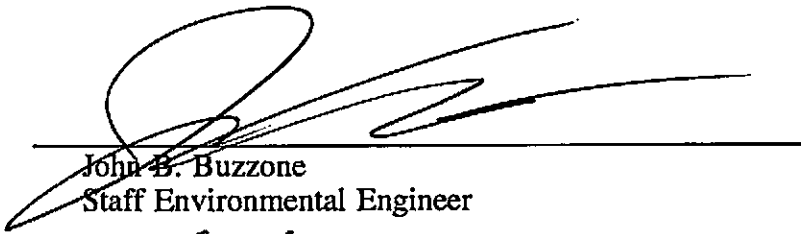
The metal contamination appears to be primarily restricted to the surface soils, and appears to be the result of the paint fragments found at the site. During the site activities, Clayton observed the paint fragments over much of the property, but the highest visual concentrations were observed on the southern portion of the property in the vicinity of SB-1, SB-2, and SB-3. Clayton could not identify the source of TPH-D contamination in sample SB-3@2.5, nor is there enough information to determine the extent of TPH-D contamination on this portion of the property.

5.0 RECOMMENDATIONS

Clayton recommends that the soil samples with total metal concentrations that have total metal concentrations that are in excess of ten times the STLC value for any individual metal be analyzed to further characterize the site's soils.

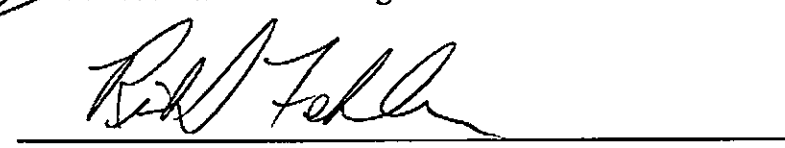
Clayton also recommends that additional investigation be conducted at the site to determine the lateral and vertical extent of the metal and TPH-D contamination of the soils at the site. Once the extent and magnitude of the contamination has been identified, we recommend that a remedial action plan be developed and implemented.

This report prepared by:



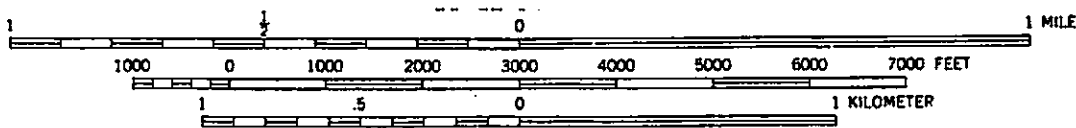
John B. Buzzone
Staff Environmental Engineer

This report reviewed by:



Richard D. Fehler
Director, Environmental Management Services
San Francisco Regional Office

May 22, 1995



OAKLAND EAST, CALIF.
 SW/4 CONCORD 15' QUADRANGLE
 N3745—W12207.5/7.5



Site Location and Topographic Map
 CRYER BOAT YARD
 1899 Dennison Street
 Oakland, California

Clayton Project No. 58560.14

Figure

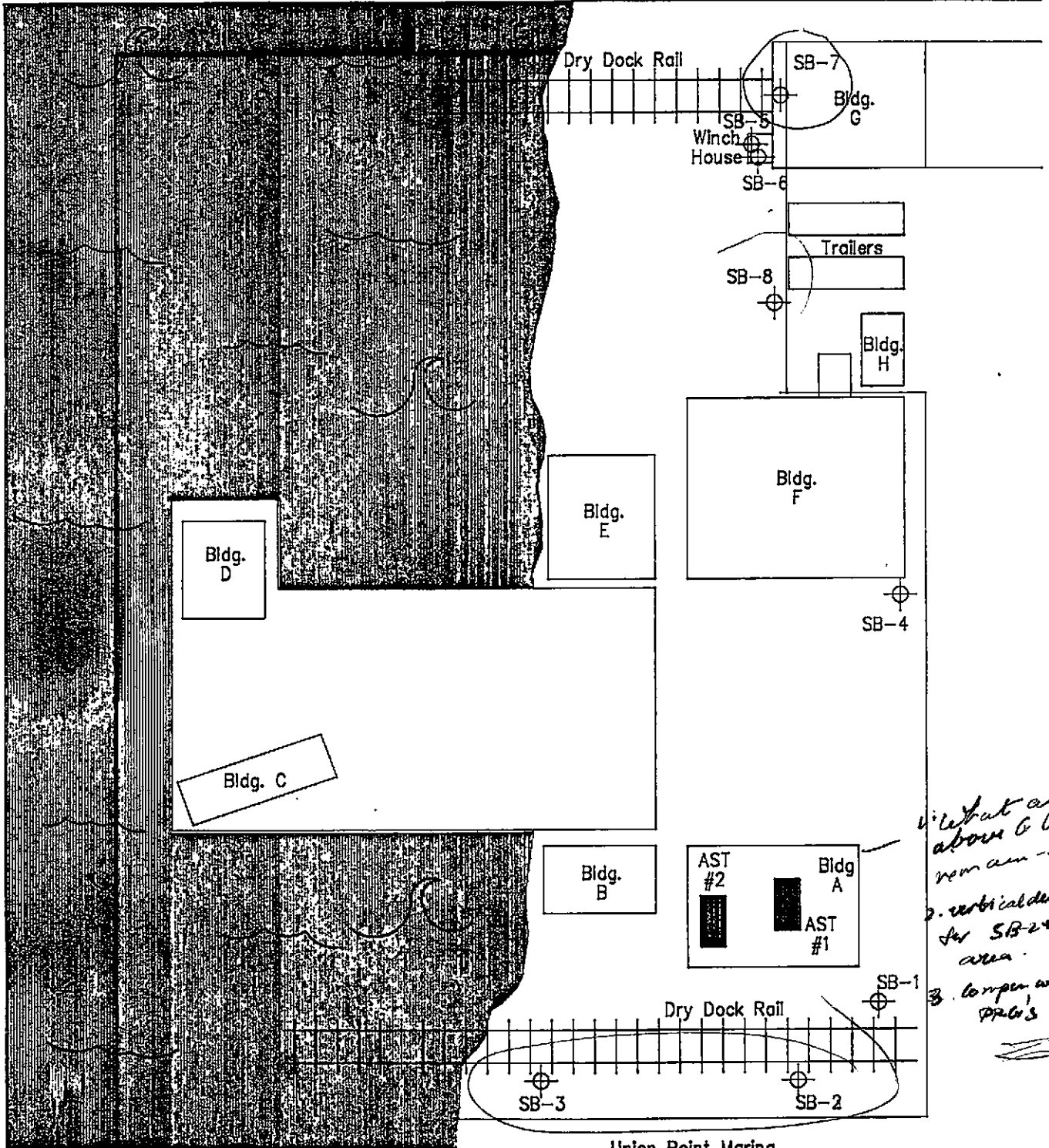
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 CONSULTANTS

5856014A-16

Vacant

Bridge



What about above 6 UST - how many - see?
2. vertical delineation for SB-2 + SB-3 area.
3. compare with PRG's



Site Map
 CRYER BOAT YARD
 1899 Dennison Street
 Oakland, California

Clayton Project No. 58560.25

Figure

2

Clayton
 ENVIRONMENTAL
 CONSULTANTS

58560-25-17

APPENDIX A

ANALYTICAL RESULTS SUMMARY

Summary of Analytical Results

Sample ID	Depth (feet)	TPH-ID	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Copper	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
SB-1@S	Surface	-	9	10	190	0.2	5.5	280	32	3,900	530	2.3	5	110	<1	<0.5	5	45	1,600
SB-1@2.5	2.5	18	3	<1	110	0.3	<0.5	54	11	49	29	<0.1	<1	50	<1	<0.5	<1	39	93
SB-2@S	Surface	-	6	6	280	0.5	2.1	150	42	9,100	230	2.1	3	87	<1	<0.5	9	73	1,200
SB-2@2.5	2.5	18	3	<1	61	0.2	<0.5	47	10	110	59	0.1	1	30	<1	<0.5	<1	37	120
SB-3@S	Surface	-	24	5	170	0.2	2.6	410	27	3,100	520	1.1	2	140	<1	<0.5	4	39	1,700
SB-3@2.5	2.5	460	14	6	130	0.1	0.6	94	16	1,300	300	0.5	<1	58	<1	<0.5	<1	37	520
SB-4@4	4	24	2	<1	160	0.4	<0.5	59	8	34	13	<0.1	<1	67	<1	<0.5	<1	37	69
SB-5@1.5	1.5	530	3	2	24	<0.1	<0.5	26	6	51	33	0.4	<1	20	<1	<0.5	<1	25	220
SB-6@1.5	1.5	240	12	14	75	<0.1	1.5	16	12	1,100	220	20	<1	45	<1	<0.5	<1	18	780
SB-7@S	Surface	360	12	26	66	<0.1	7.5	240	9	6,500	720	25	2	29	<1	<0.5	<1	9	1,300
SB-8@3.5	3.5	84	14	5	99	0.2	<0.5	48	13	500	280	0.6	<1	79	<1	<0.5	<1	48	200

Concentrations are in milligrams per kilogram
 - = Not analyzed

650ppm 830

2800 400 20
 2500 1000
 25 5 0.2

23,000

APPENDIX B

ANALYTICAL REPORT

Western Operations

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P.O. Box 9019
Pleasanton, CA 94566
(510) 426-2600
Fax (510) 426-0106

Clayton
ENVIRONMENTAL
CONSULTANTS

April 10, 1995

Mr. John Buzzone
CLAYTON ENVIRONMENTAL CONSULTANTS, INC.
1252 Quarry Lane
Pleasanton, CA 94566

Client Ref.: 58560.25
Clayton Project No.: 95034.39

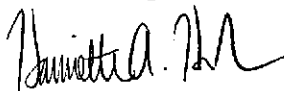
Dear Mr. Buzzone:

Attached is our analytical laboratory report for the samples received on March 30, 1995. Also enclosed is a copy of the Chain-of-Custody record acknowledging receipt of these samples.

Please note that any unused portion of the samples will be discarded after May 10, 1995, unless you have requested otherwise.

We appreciate the opportunity to assist you. If you have any questions concerning this report, please contact Suzanne Haus, Client Services Supervisor, at (510) 426-2657.

Sincerely,



Harriotte A. Hurley, CIH
Director, Laboratory Services
San Francisco Regional Office

HAH/caa

Attachments

Analytical Results
for
Port of Oakland
Client Reference: 58560.25
Clayton Project No. 95034.39

Sample Identification: SB-1 @ 5'
Lab Number: 9503439-01
Sample Matrix/Media: SOIL

Date Sampled: 03/30/95
Date Received: 03/30/95

Analyte	Concentration	Method		Date Prepared	Date Analyzed	Prep Method	Method Reference
		Detection Limit	Units				
Antimony	9	1	mg/kg	04/03/95	04/04/95	EPA 3050	EPA 6010A
Arsenic	10	1	mg/kg	04/03/95	04/04/95	EPA 3050	EPA 6010A
Barium	190	1	mg/kg	04/03/95	04/04/95	EPA 3050	EPA 6010A
Beryllium	0.2	0.1	mg/kg	04/03/95	04/04/95	EPA 3050	EPA 6010A
Cadmium	5.5	0.5	mg/kg	04/03/95	04/04/95	EPA 3050	EPA 6010A
Chromium	280	1	mg/kg	04/03/95	04/04/95	EPA 3050	EPA 6010A
Cobalt	32	1	mg/kg	04/03/95	04/04/95	EPA 3050	EPA 6010A
Copper	3900	1	mg/kg	04/03/95	04/05/95	EPA 3050	EPA 6010A
Lead	530	1	mg/kg	04/03/95	04/04/95	EPA 3050	EPA 6010A
Mercury	2.3	0.1	mg/kg	04/07/95	04/07/95	EPA 7471	EPA 7471
Molybdenum	5	1	mg/kg	04/03/95	04/04/95	EPA 3050	EPA 6010A
Nickel	110	1	mg/kg	04/03/95	04/04/95	EPA 3050	EPA 6010A
Selenium	<1	1	mg/kg	04/03/95	04/04/95	EPA 3050	EPA 6010A
Silver	<0.5	0.5	mg/kg	04/03/95	04/04/95	EPA 3050	EPA 6010A
Sodium	5	1	mg/kg	04/03/95	04/04/95	EPA 3050	EPA 6010A
Titanium	45	1	mg/kg	04/03/95	04/04/95	EPA 3050	EPA 6010A
Zinc	1600	1	mg/kg	04/03/95	04/04/95	EPA 3050	EPA 6010A

ND: Not detected at or above limit of detection

NA: Information not available or not applicable

Results are reported on a wet-weight basis, as received.

Analytical Results
for
Port of Oakland
Client Reference: 58560.25
Clayton Project No. 95034.39

Sample Identification: SB-1 @ 2.5'
Lab Number: 9503439-02
Sample Matrix/Media: SOIL

Date Sampled: 03/30/95
Date Received: 03/30/95

Analyte	Concentration	Method		Units	Date Prepared	Date Analyzed	Prep Method	Method Reference
		Detection Limit						
Antimony	3	1		mg/kg	04/03/95	04/04/95	EPA 3050	EPA 6010A
Arsenic	<1	1		mg/kg	04/03/95	04/04/95	EPA 3050	EPA 6010A
Barium	110	1		mg/kg	04/03/95	04/04/95	EPA 3050	EPA 6010A
Beryllium	0.3	0.1		mg/kg	04/03/95	04/04/95	EPA 3050	EPA 6010A
Cadmium	<0.5	0.5		mg/kg	04/03/95	04/04/95	EPA 3050	EPA 6010A
Chromium	54	1		mg/kg	04/03/95	04/04/95	EPA 3050	EPA 6010A
Cobalt	11	1		mg/kg	04/03/95	04/04/95	EPA 3050	EPA 6010A
Copper	49	1		mg/kg	04/03/95	04/04/95	EPA 3050	EPA 6010A
Lead	29	1		mg/kg	04/03/95	04/04/95	EPA 3050	EPA 6010A
Mercury	<0.1	0.1		mg/kg	04/07/95	04/07/95	EPA 7471	EPA 7471
Molybdenum	<1	1		mg/kg	04/03/95	04/04/95	EPA 3050	EPA 6010A
Nickel	50	1		mg/kg	04/03/95	04/04/95	EPA 3050	EPA 6010A
Selenium	<1	1		mg/kg	04/03/95	04/04/95	EPA 3050	EPA 6010A
Silver	<0.5	0.5		mg/kg	04/03/95	04/04/95	EPA 3050	EPA 6010A
PH-D	18	a		mg/kg	04/06/95	04/10/95	EPA 3550	EPA 8015*
Thallium	<1	1		mg/kg	04/03/95	04/04/95	EPA 3050	EPA 6010A
Vanadium	39	1		mg/kg	04/03/95	04/04/95	EPA 3050	EPA 6010A
Zinc	93	1		mg/kg	04/03/95	04/04/95	EPA 3050	EPA 6010A

D: Not detected at or above limit of detection

--: Information not available or not applicable

Results are reported on a wet-weight basis, as received.

PH-D = Extractable petroleum hydrocarbons from C10 to C42 quantitated as diesel.

* = Modified

Sample does not match the typical diesel pattern.

Sample appears to be oil.

Analytical Results
for
Port of Oakland
Client Reference: 58560.25
Clayton Project No. 95034.39

Sample Identification: SB-2 @ 2.5'
Lab Number: 9503439-04
Sample Matrix/Media: SOIL

Date Sampled: 03/30/95
Date Received: 03/30/95

Analyte	Concentration	Method		Date Prepared	Date Analyzed	Prep Method	Method Reference
		Detection Limit	Units				
Antimony	3	1	mg/kg	04/03/95	04/04/95	EPA 3050	EPA 6010A
Arsenic	<1	1	mg/kg	04/03/95	04/04/95	EPA 3050	EPA 6010A
Barium	61	1	mg/kg	04/03/95	04/04/95	EPA 3050	EPA 6010A
Beryllium	0.2	0.1	mg/kg	04/03/95	04/04/95	EPA 3050	EPA 6010A
Cadmium	<0.5	0.5	mg/kg	04/03/95	04/04/95	EPA 3050	EPA 6010A
Chromium	47	1	mg/kg	04/03/95	04/04/95	EPA 3050	EPA 6010A
Cobalt	10	1	mg/kg	04/03/95	04/04/95	EPA 3050	EPA 6010A
Copper	110	1	mg/kg	04/03/95	04/04/95	EPA 3050	EPA 6010A
Lead	59	1	mg/kg	04/03/95	04/04/95	EPA 3050	EPA 6010A
Mercury	0.1	0.1	mg/kg	04/07/95	04/07/95	EPA 7471	EPA 7471
Molybdenum	1	1	mg/kg	04/03/95	04/04/95	EPA 3050	EPA 6010A
Nickel	30	1	mg/kg	04/03/95	04/04/95	EPA 3050	EPA 6010A
Selenium	<1	1	mg/kg	04/03/95	04/04/95	EPA 3050	EPA 6010A
Silver	<0.5	0.5	mg/kg	04/03/95	04/04/95	EPA 3050	EPA 6010A
PH-D	18	a	mg/kg	04/06/95	04/10/95	EPA 3550	EPA 8015*
Gallium	<1	1	mg/kg	04/03/95	04/04/95	EPA 3050	EPA 6010A
Vanadium	37	1	mg/kg	04/03/95	04/04/95	EPA 3050	EPA 6010A
Zinc	120	1	mg/kg	04/03/95	04/04/95	EPA 3050	EPA 6010A

ND: Not detected at or above limit of detection
NA: Information not available or not applicable

Results are reported on a wet-weight basis, as received.
PH-D = Extractable petroleum hydrocarbons from C10 to C42 quantitated as diesel.
* = Modified

Sample does not match the typical diesel pattern.
Sample appears to be oil.

Analytical Results
for
Port of Oakland
Client Reference: 58560.25
Clayton Project No. 95034.39

Sample Identification: SB-3 @ 5'
Lab Number: 9503439-05
Sample Matrix/Media: SOIL

Date Sampled: 03/30/95
Date Received: 03/30/95

Analyte	Concentration	Method Detection Limit	Units	Date Prepared	Date Analyzed	Prep Method	Method Reference
Antimony	24	1	mg/kg	04/03/95	04/04/95	EPA 3050	EPA 6010A
Arsenic	5	1	mg/kg	04/03/95	04/04/95	EPA 3050	EPA 6010A
Barium	170	1	mg/kg	04/03/95	04/04/95	EPA 3050	EPA 6010A
Beryllium	0.2	0.1	mg/kg	04/03/95	04/04/95	EPA 3050	EPA 6010A
Cadmium	2.6	0.5	mg/kg	04/03/95	04/04/95	EPA 3050	EPA 6010A
Chromium	410	1	mg/kg	04/03/95	04/04/95	EPA 3050	EPA 6010A
Cobalt	27	1	mg/kg	04/03/95	04/04/95	EPA 3050	EPA 6010A
Copper	3100	1	mg/kg	04/03/95	04/05/95	EPA 3050	EPA 6010A
Lead	520	1	mg/kg	04/03/95	04/04/95	EPA 3050	EPA 6010A
Mercury	1.1	0.1	mg/kg	04/07/95	04/07/95	EPA 7471	EPA 7471
Molybdenum	2	1	mg/kg	04/03/95	04/04/95	EPA 3050	EPA 6010A
Nickel	140	1	mg/kg	04/03/95	04/04/95	EPA 3050	EPA 6010A
Selenium	<1	1	mg/kg	04/03/95	04/04/95	EPA 3050	EPA 6010A
Silver	<0.5	0.5	mg/kg	04/03/95	04/04/95	EPA 3050	EPA 6010A
Thallium	4	1	mg/kg	04/03/95	04/04/95	EPA 3050	EPA 6010A
Vanadium	39	1	mg/kg	04/03/95	04/04/95	EPA 3050	EPA 6010A
Zinc	1700	1	mg/kg	04/03/95	04/04/95	EPA 3050	EPA 6010A

ND: Not detected at or above limit of detection

---: Information not available or not applicable

Results are reported on a wet-weight basis, as received.

Analytical Results
for
Port of Oakland
Client Reference: 58560.25
Clayton Project No. 95034.39

Sample Identification: SB-3 @ 2.5'
Lab Number: 9503439-06
Sample Matrix/Media: SOIL

Date Sampled: 03/30/95
Date Received: 03/30/95

Analyte	Concentration	Method		Units	Date Prepared	Date Analyzed	Prep Method	Method Reference
		Detection Limit						
Antimony	14	1		mg/kg	04/03/95	04/04/95	EPA 3050	EPA 6010A
Arsenic	6	1		mg/kg	04/03/95	04/04/95	EPA 3050	EPA 6010A
Barium	130	1		mg/kg	04/03/95	04/04/95	EPA 3050	EPA 6010A
Beryllium	0.1	0.1		mg/kg	04/03/95	04/04/95	EPA 3050	EPA 6010A
Cadmium	0.6	0.5		mg/kg	04/03/95	04/04/95	EPA 3050	EPA 6010A
Chromium	94	1		mg/kg	04/03/95	04/04/95	EPA 3050	EPA 6010A
Cobalt	16	1		mg/kg	04/03/95	04/04/95	EPA 3050	EPA 6010A
Copper	1300	1		mg/kg	04/03/95	04/04/95	EPA 3050	EPA 6010A
Lead	300	1		mg/kg	04/03/95	04/04/95	EPA 3050	EPA 6010A
Mercury	0.5	0.1		mg/kg	04/07/95	04/07/95	EPA 7471	EPA 7471
Molybdenum	<1	1		mg/kg	04/03/95	04/04/95	EPA 3050	EPA 6010A
Nickel	58	1		mg/kg	04/03/95	04/04/95	EPA 3050	EPA 6010A
Selenium	<1	1		mg/kg	04/03/95	04/04/95	EPA 3050	EPA 6010A
Silver	<0.5	0.5		mg/kg	04/03/95	04/04/95	EPA 3050	EPA 6010A
PH-D	460	1	a	mg/kg	04/06/95	04/10/95	EPA 3550	EPA 8015*
Thallium	<1	1		mg/kg	04/03/95	04/04/95	EPA 3050	EPA 6010A
Vanadium	37	1		mg/kg	04/03/95	04/04/95	EPA 3050	EPA 6010A
Zinc	520	1		mg/kg	04/03/95	04/04/95	EPA 3050	EPA 6010A

ND: Not detected at or above limit of detection
NA: Information not available or not applicable

Results are reported on a wet-weight basis, as received.
PH-D = Extractable petroleum hydrocarbons from C10 to C42 quantitated as diesel.
* = Modified
Sample does not match the typical diesel pattern.
Sample appears to be oil.

Analytical Results
for
Port of Oakland
Client Reference: 58560.25
Clayton Project No. 95034.39

Sample Identification: SB-4 @ 4'
Lab Number: 9503439-07
Sample Matrix/Media: SOIL

Date Sampled: 03/30/95
Date Received: 03/30/95

Analyte	Concentration	Method		Date Prepared	Date Analyzed	Prep Method	Method Reference
		Detection Limit	Units				
Antimony	2	1	mg/kg	04/03/95	04/04/95	EPA 3050	EPA 6010A
Arsenic	<1	1	mg/kg	04/03/95	04/04/95	EPA 3050	EPA 6010A
Barium	160	1	mg/kg	04/03/95	04/04/95	EPA 3050	EPA 6010A
Beryllium	0.4	0.1	mg/kg	04/03/95	04/04/95	EPA 3050	EPA 6010A
Cadmium	<0.5	0.5	mg/kg	04/03/95	04/04/95	EPA 3050	EPA 6010A
Chromium	59	1	mg/kg	04/03/95	04/04/95	EPA 3050	EPA 6010A
Cobalt	8	1	mg/kg	04/03/95	04/04/95	EPA 3050	EPA 6010A
Copper	34	1	mg/kg	04/03/95	04/04/95	EPA 3050	EPA 6010A
Lead	13	1	mg/kg	04/03/95	04/04/95	EPA 3050	EPA 6010A
Mercury	<0.1	0.1	mg/kg	04/07/95	04/07/95	EPA 7471	EPA 7471
Molybdenum	<1	1	mg/kg	04/03/95	04/04/95	EPA 3050	EPA 6010A
Nickel	67	1	mg/kg	04/03/95	04/04/95	EPA 3050	EPA 6010A
Selenium	<1	1	mg/kg	04/03/95	04/04/95	EPA 3050	EPA 6010A
Silver	<0.5	0.5	mg/kg	04/03/95	04/04/95	EPA 3050	EPA 6010A
PH-D	24	a	mg/kg	04/06/95	04/10/95	EPA 3550	EPA 8015*
Thallium	<1	1	mg/kg	04/03/95	04/04/95	EPA 3050	EPA 6010A
Vanadium	37	1	mg/kg	04/03/95	04/04/95	EPA 3050	EPA 6010A
Zinc	69	1	mg/kg	04/03/95	04/04/95	EPA 3050	EPA 6010A

D: Not detected at or above limit of detection

-: Information not available or not applicable

Results are reported on a wet-weight basis, as received.

PH-D = Extractable petroleum hydrocarbons from C10 to C42 quantitated as diesel.

* = Modified

Sample does not match the typical diesel pattern.

Sample appears to be oil.

Analytical Results
for
Port of Oakland
Client Reference: 58560.25
Clayton Project No. 95034.39

Sample Identification: SB-5 @ 1.5'
Lab Number: 9503439-08
Sample Matrix/Media: SOIL

Date Sampled: 03/30/95
Date Received: 03/30/95

Analyte	Concentration	Method		Units	Date Prepared	Date Analyzed	Prep Method	Method Reference
		Detection Limit						
Antimony	3	1		mg/kg	04/03/95	04/04/95	EPA 3050	EPA 6010A
Arsenic	2	1		mg/kg	04/03/95	04/04/95	EPA 3050	EPA 6010A
Barium	24	1		mg/kg	04/03/95	04/04/95	EPA 3050	EPA 6010A
Beryllium	<0.1	0.1		mg/kg	04/03/95	04/04/95	EPA 3050	EPA 6010A
Cadmium	<0.5	0.5		mg/kg	04/03/95	04/04/95	EPA 3050	EPA 6010A
Chromium	26	1		mg/kg	04/03/95	04/04/95	EPA 3050	EPA 6010A
Cobalt	6	1		mg/kg	04/03/95	04/04/95	EPA 3050	EPA 6010A
Copper	51	1		mg/kg	04/03/95	04/04/95	EPA 3050	EPA 6010A
Lead	33	1		mg/kg	04/03/95	04/04/95	EPA 3050	EPA 6010A
Mercury	0.4	0.1		mg/kg	04/07/95	04/07/95	EPA 7471	EPA 7471
Molybdenum	<1	1		mg/kg	04/03/95	04/04/95	EPA 3050	EPA 6010A
Nickel	20	1		mg/kg	04/03/95	04/04/95	EPA 3050	EPA 6010A
Selenium	<1	1		mg/kg	04/03/95	04/04/95	EPA 3050	EPA 6010A
Silver	<0.5	0.5		mg/kg	04/03/95	04/04/95	EPA 3050	EPA 6010A
PH-D	530 a	1		mg/kg	04/06/95	04/10/95	EPA 3550	EPA 8015*
Thallium	<1	1		mg/kg	04/03/95	04/04/95	EPA 3050	EPA 6010A
Vanadium	25	1		mg/kg	04/03/95	04/04/95	EPA 3050	EPA 6010A
Zinc	220	1		mg/kg	04/03/95	04/04/95	EPA 3050	EPA 6010A

ND: Not detected at or above limit of detection

NA: Information not available or not applicable

Results are reported on a wet-weight basis, as received.

PH-D = Extractable petroleum hydrocarbons from C10 to C42 quantitated as diesel.

* = Modified

Sample does not match the typical diesel pattern.

Sample appears to be oil.

Analytical Results
for
Port of Oakland
Client Reference: 58560.25
Clayton Project No. 95034.39

Sample Identification: SB-6 @ 1.5'
Lab Number: 9503439-09
Sample Matrix/Media: SOIL

Date Sampled: 03/30/95
Date Received: 03/30/95

Analyte	Concentration	Method		Units	Date Prepared	Date Analyzed	Prep Method	Method Reference
		Detection Limit						
Antimony	12	1		mg/kg	04/03/95	04/04/95	EPA 3050	EPA 6010A
Arsenic	14	1		mg/kg	04/03/95	04/04/95	EPA 3050	EPA 6010A
Barium	75	1		mg/kg	04/03/95	04/04/95	EPA 3050	EPA 6010A
Beryllium	<0.1	0.1		mg/kg	04/03/95	04/04/95	EPA 3050	EPA 6010A
Cadmium	1.5	0.5		mg/kg	04/03/95	04/04/95	EPA 3050	EPA 6010A
Chromium	16	1		mg/kg	04/03/95	04/04/95	EPA 3050	EPA 6010A
Cobalt	12	1		mg/kg	04/03/95	04/04/95	EPA 3050	EPA 6010A
Copper	1100	1		mg/kg	04/03/95	04/04/95	EPA 3050	EPA 6010A
Lead	220	1		mg/kg	04/03/95	04/04/95	EPA 3050	EPA 6010A
Mercury	20	0.1		mg/kg	04/07/95	04/07/95	EPA 7471	EPA 7471
Molybdenum	<1	1		mg/kg	04/03/95	04/04/95	EPA 3050	EPA 6010A
Nickel	45	1		mg/kg	04/03/95	04/04/95	EPA 3050	EPA 6010A
Selenium	<1	1		mg/kg	04/03/95	04/04/95	EPA 3050	EPA 6010A
Silver	<0.5	0.5		mg/kg	04/03/95	04/04/95	EPA 3050	EPA 6010A
PH-D	240	a	1	mg/kg	04/06/95	04/10/95	EPA 3550	EPA 8015*
Thallium	<1	1		mg/kg	04/03/95	04/04/95	EPA 3050	EPA 6010A
Vanadium	18	1		mg/kg	04/03/95	04/04/95	EPA 3050	EPA 6010A
Zinc	780	1		mg/kg	04/03/95	04/04/95	EPA 3050	EPA 6010A

ND: Not detected at or above limit of detection

NA: Information not available or not applicable

Results are reported on a wet-weight basis, as received.

PH-D = Extractable petroleum hydrocarbons from C10 to C42 quantitated as diesel.

* = Modified

Sample does not match the typical diesel pattern.

Sample appears to be oil.

Analytical Results
for
Port of Oakland
Client Reference: 58560.25
Clayton Project No. 95034.39

Sample Identification: SB-7 @ 5'
Lab Number: 9503439-10
Sample Matrix/Media: SOIL

Date Sampled: 03/30/95
Date Received: 03/30/95

Analyte	Concentration	Method		Units	Date Prepared	Date Analyzed	Prep Method	Method Reference
		Detection Limit						
Antimony	12	1		mg/kg	04/03/95	04/04/95	EPA 3050	EPA 6010A
Arsenic	26	1		mg/kg	04/03/95	04/04/95	EPA 3050	EPA 6010A
Barium	66	1		mg/kg	04/03/95	04/04/95	EPA 3050	EPA 6010A
Beryllium	<0.1	0.1		mg/kg	04/03/95	04/04/95	EPA 3050	EPA 6010A
Cadmium	7.5	0.5		mg/kg	04/03/95	04/04/95	EPA 3050	EPA 6010A
Chromium	240	1		mg/kg	04/03/95	04/04/95	EPA 3050	EPA 6010A
Cobalt	9	1		mg/kg	04/03/95	04/04/95	EPA 3050	EPA 6010A
Copper	6500	1		mg/kg	04/03/95	04/05/95	EPA 3050	EPA 6010A
Lead	720	1		mg/kg	04/03/95	04/04/95	EPA 3050	EPA 6010A
Mercury	25	0.1		mg/kg	04/07/95	04/07/95	EPA 7471	EPA 7471
Molybdenum	2	1		mg/kg	04/03/95	04/04/95	EPA 3050	EPA 6010A
Nickel	29	1		mg/kg	04/03/95	04/04/95	EPA 3050	EPA 6010A
Selenium	<1	1		mg/kg	04/03/95	04/04/95	EPA 3050	EPA 6010A
Silver	<0.5	0.5		mg/kg	04/03/95	04/04/95	EPA 3050	EPA 6010A
PH-D	360	a		mg/kg	04/06/95	04/10/95	EPA 3550	EPA 8015*
Gallium	<1	1		mg/kg	04/03/95	04/04/95	EPA 3050	EPA 6010A
Vanadium	9	1		mg/kg	04/03/95	04/04/95	EPA 3050	EPA 6010A
Zinc	1300	1		mg/kg	04/03/95	04/04/95	EPA 3050	EPA 6010A

o: Not detected at or above limit of detection
a: Information not available or not applicable

Results are reported on a wet-weight basis, as received.
PH-D = Extractable petroleum hydrocarbons from C10 to C42 quantitated as diesel.
* = Modified
Sample does not match the typical diesel pattern.
Sample appears to be oil.

Analytical Results
for
Port of Oakland
Client Reference: 58560.25
Clayton Project No. 95034.39

Sample Identification: SB-8 @ 3.5'
Lab Number: 9503439-11
Sample Matrix/Media: SOIL

Date Sampled: 03/30/95
Date Received: 03/30/95

Analyte	Concentration	Method		Date Prepared	Date Analyzed	Prep Method	Method Reference
		Detection Limit	Units				
Antimony	14	1	mg/kg	04/03/95	04/04/95	EPA 3050	EPA 6010A
Arsenic	5	1	mg/kg	04/03/95	04/04/95	EPA 3050	EPA 6010A
Barium	99	1	mg/kg	04/03/95	04/04/95	EPA 3050	EPA 6010A
Beryllium	0.2	0.1	mg/kg	04/03/95	04/04/95	EPA 3050	EPA 6010A
Cadmium	<0.5	0.5	mg/kg	04/03/95	04/04/95	EPA 3050	EPA 6010A
Chromium	48	1	mg/kg	04/03/95	04/04/95	EPA 3050	EPA 6010A
Cobalt	13	1	mg/kg	04/03/95	04/04/95	EPA 3050	EPA 6010A
Copper	500	1	mg/kg	04/03/95	04/04/95	EPA 3050	EPA 6010A
Lead	280	1	mg/kg	04/03/95	04/04/95	EPA 3050	EPA 6010A
Mercury	0.6	0.1	mg/kg	04/07/95	04/07/95	EPA 7471	EPA 7471
Molybdenum	<1	1	mg/kg	04/03/95	04/04/95	EPA 3050	EPA 6010A
Nickel	79	1	mg/kg	04/03/95	04/04/95	EPA 3050	EPA 6010A
Selenium	<1	1	mg/kg	04/03/95	04/04/95	EPA 3050	EPA 6010A
Silver	<0.5	0.5	mg/kg	04/03/95	04/04/95	EPA 3050	EPA 6010A
PH-D	84	a	mg/kg	04/06/95	04/10/95	EPA 3550	EPA 8015*
Thallium	<1	1	mg/kg	04/03/95	04/04/95	EPA 3050	EPA 6010A
Vanadium	48	1	mg/kg	04/03/95	04/04/95	EPA 3050	EPA 6010A
Zinc	200	1	mg/kg	04/03/95	04/04/95	EPA 3050	EPA 6010A

D: Not detected at or above limit of detection
a: Information not available or not applicable

Results are reported on a wet-weight basis, as received.

PH-D = Extractable petroleum hydrocarbons from C10 to C42 quantitated as diesel.

* = Modified

Sample does not match the typical diesel pattern.

Sample appears to be oil.

Analytical Results
for
Port of Oakland
Client Reference: 58560.25
Clayton Project No. 95034.39

Sample Identification: METHOD BLANK
Lab Number: 9503439-12
Sample Matrix/Media: SOIL

Date Sampled: --
Date Received: --

Analyte	Concentration	Method		Date Prepared	Date Analyzed	Prep Method	Method Reference
		Detection Limit	Units				
Antimony	<1	1	mg/kg	04/03/95	04/04/95	EPA 3050	EPA 6010A
Arsenic	<1	1	mg/kg	04/03/95	04/04/95	EPA 3050	EPA 6010A
Barium	<1	1	mg/kg	04/03/95	04/04/95	EPA 3050	EPA 6010A
Beryllium	<0.1	0.1	mg/kg	04/03/95	04/04/95	EPA 3050	EPA 6010A
Cadmium	<0.5	0.5	mg/kg	04/03/95	04/04/95	EPA 3050	EPA 6010A
Chromium	<1	1	mg/kg	04/03/95	04/04/95	EPA 3050	EPA 6010A
Cobalt	<1	1	mg/kg	04/03/95	04/04/95	EPA 3050	EPA 6010A
Copper	<1	1	mg/kg	04/03/95	04/04/95	EPA 3050	EPA 6010A
Lead	<1	1	mg/kg	04/03/95	04/04/95	EPA 3050	EPA 6010A
Mercury	<0.1	0.1	mg/kg	04/07/95	04/07/95	EPA 7471	EPA 7471
Molybdenum	<1	1	mg/kg	04/03/95	04/04/95	EPA 3050	EPA 6010A
Nickel	<1	1	mg/kg	04/03/95	04/04/95	EPA 3050	EPA 6010A
Selenium	<1	1	mg/kg	04/03/95	04/04/95	EPA 3050	EPA 6010A
Silver	<0.5	0.5	mg/kg	04/03/95	04/04/95	EPA 3050	EPA 6010A
TH-D	ND	1	mg/kg	04/06/95	04/07/95	EPA 3550	EPA 8015*
Thallium	<1	1	mg/kg	04/03/95	04/04/95	EPA 3050	EPA 6010A
Vanadium	<1	1	mg/kg	04/03/95	04/04/95	EPA 3050	EPA 6010A
Zinc	<1	1	mg/kg	04/03/95	04/04/95	EPA 3050	EPA 6010A

ND: Not detected at or above limit of detection

Information not available or not applicable

Results are reported on a wet-weight basis, as received.

TH-D = Extractable petroleum hydrocarbons from C10 to C42 quantitated as diesel.

* = Modified