

The logo for Aqua Terra Technologies, consisting of the letters 'ATT' in a bold, serif font, enclosed within a rectangular border.

July 11, 1988

RECEIVED
JUL 27 1988
HAZARDOUS MATERIALS/
WASTE PROGRAM

Mr. Walter Kaczmarek
The Martin Company
6475 Christie Street #406 500
Emeryville, CA 94611

Subject: Classification of an Asphalt-Like Waste
Material Found on the Marketplace and Nielson
Site in Emeryville, CA

Dear Mr. Kaczmarek:

At the request of The Martin Company, Aqua Terra Technologies, Inc. (ATT) has evaluated the hazardous waste characteristics of the asphalt-like material found in soil and a floating material on groundwater at the Marketplace and Nielson sites in Emeryville, California. The hazardous criteria used in this evaluation are those described in the California Code of Regulations (CCR), Title 22, Section 66680 et. seq.

Aqua Terra Technologies
Consulting Engineers
& Scientists

2950 Buskirk Avenue
Suite 120
Walnut Creek, CA
94596
415 934-4884

BACKGROUND

The Marketplace and Nielsen sites are contiguous sites in Emeryville. The Marketplace site has been a site of historic industrial use since the 1800s. Site conditions left from the historic use by a floor and roof covering manufacturer (The Parrafine Companies/PABCO) are well documented in two previous reports on file with Alameda County. A Woodward-Clyde report, "Assessment of Subsurface Contaminants Marketplace Property, Emeryville California" was filed in 1982. An Earth Metrics report, "Draft Work Plan for Soils Contamination Characterization of Marketplace Site in Emeryville California" was filed in 1987 and updated again in 1988. The Nielson Truck Terminal site also has been the subject of previous investigations (Woodward-Clyde report, "Environmental Assessment Former Nielsen Freight Line Site and Adjacent Parcel, Emeryville California"). All historic underground fuel and waste oil tanks have been removed, as of 1987. A report was filed by Woodward-Clyde at the time of tank closure. A subsequent report by Earth Metrics, "Soil and Groundwater Contaminant Investigation for the Former Nielson Freight Lines Site in Emeryville, California" and Final Tank Closure Permit Application were filed in 1988.

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These reports address three separate contaminant issues: gasoline in site soil, diesel fuel in site soil, and an asphalt-like material in site soil. The asphalt-like material has been identified in two deposits, the larger of which is located in the northeast corner of the Marketplace site. All contamination investigation reports on file with the Alameda County, from 1982 on, have acknowledged the presence of this asphalt-like material. Recently, on May 2, 1988, the Alameda County Hazardous Materials Unit suggested that this asphalt-like material may be a potential hazard.

On May 20, 1988, ATT submitted to the Alameda County Hazardous Waste Unit a plan to evaluate the hazardous waste characteristics of this asphalt-like material. Sample collections, analysis, results, and conclusions of the hazardous waste characterization are presented below.

SAMPLE COLLECTION AND ANALYSIS

Four representative sampling locations were identified in the plan to evaluate hazardous waste characteristics (Attachment A, Plate 1). Soil samples containing the asphalt-like material were collected from Test Pit 6 which is located adjacent to Test Pit 7 (this sample was designated E1 (TP6) (#7) on the chain of custody and E1 on the laboratory reports) and soil boring EM4 (EM4). A sample of floating material (WS) was collected from Well 5. The third suggested soil sampling location adjacent to soil boring EM2 was not sampled because construction materials stacked at this location obstructed excavation. The three samples collected represent various concentrated forms of the asphalt-like substance. The three sampling locations are also representative of the apparent distribution of this substance on the Marketplace and Nielsen sites.

At the Test Pit 6 and EM4 locations, a backhoe was used to uncover the asphalt-like material in soil. Soil samples were collected by hand with a Teflon coated spatula. A floating product sample from Well 5 was collected with a Teflon bailer. Sufficient sample volume from each site was collected to fill two eight-ounce prewashed glass sample containers with Teflon lined closures. One container of each sample was submitted to Sequoia Analytical Laboratory for chemical and physical analyses and the second was submitted to

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ATT for bioassay testing. Samples were transported and stored chilled and were accompanied during all steps of the process with the appropriate chain of custody documentation.

Each of the these samples was analyzed for hazardous waste characteristics listed in Title 22 of the CCR Sections 66680 et seq. Specific analyses included:

- o Volatile organic chemicals with library search (EPA Method 8240)
- o Semivolatile organic chemicals with library search (EPA Method 8240)
- o CCR 17 heavy metals by inductively coupled argon plasma spectrometry (EPA Method 6010) and atomic absorption graphite furnace (EPA 7000 series)
- o Ignitability (according to the method described in CCR Title 22, Section 666702)
- o Corrosivity (according to the method described in CCR Title 22, Section 66708)
- o Aquatic bioassay (according to the method described in CCR Title 22, Section 66696)

The asphalt-like material is not unstable and does not react violently with water, or form explosive mixtures with water or appear to generate toxic gases, vapors, or fumes, when mixed with water. The material is also not explosive. Therefore, in our opinion the asphalt-like material is not reactive because the material does not meet any of the criteria listed in Section 66705 of Title 22.

The chemical analyses and bioassay testing were conducted by Sequoia Analytical Laboratory and ATT, respectively. The laboratories are certified by the State of California Department of Health Services for the hazardous waste analyses performed.

RESULTS AND DISCUSSION

The analytical results for samples of the asphalt-like material are presented in Attachment 2. The bioassay results are presented in Attachment 3. A discussion of the results and an evaluation of hazardous waste characteristics of the samples are presented below.

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A waste may be classified as hazardous or nonhazardous as authorized in Section 66305 of Article 11, Title 22 of the CCR. If a waste meets any of the criteria of Article 11, it may be classified as hazardous. Any waste which is hazardous pursuant to any of the criteria must be managed in accordance with the provisions of Subchapter 30. However, an exception to this requirement is that any waste classified as a special waste under Section 66746 may be managed as a Special Waste under Section 66746.

Ignitability

The results of the ignitability test showed that the three samples of the asphalt-like materials which were tested had flashpoints greater than 60°C. These samples do not cause fire through friction and are not classified oxidizers according to CFR 173.151. The results indicate that samples E1, EM4, and W5 do not meet the criteria for ignitability according to Section 66702 of Title 22.

Reactivity

The asphalt-like material is not unstable, does not react violently with water, or generate toxic fumes when mixed with water. This material also is not explosive. Therefore, samples E1, EM4 and W5 do not meet the criteria for reactivity according to Section 66705 of Title 22.

Corrosivity

The corrosivity test based on pH showed that all samples were within the neutral range (7 to 8.8). Therefore, samples E1, EM4, and W5 do not meet the pH criteria of less than or equal to 2 or greater than or equal to 12.5 for corrosivity according to Section 66708 of Title 22.

Toxicity Criteria

The results of the Nitric Acid digestion for the Total Threshold Limit concentration (TTLC) showed that concentrations of metals extracted from the three samples were substantially less than the TTLC for these metals. To evaluate the Soluble Threshold Limit Concentration (STLC) criteria, the measured concentrations were divided by 10 and compared to STLC

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values. This approach assumes that 100 percent of the metals extracted with nitric acid will also be extracted with the STLC procedure and that concentrations will be diluted 10:1 as described in the Waste Extraction Test (Section 66700). This interpretation is conservative. The adjusted concentrations for all samples are well below the STLC values.

Volatile organic chemicals were detected only in soil sample EM4. Acetone was measured at 2500 micrograms/kilogram (ug/Kg) and methylene chloride at 800 ug/Kg. Acetone and methylene chloride have not previously been identified in soil samples from the Market Place and Nielson sites. These chemicals are used in various extraction procedures and are common contaminants resulting from laboratory exposures. There is, however, no conclusive evidence that measured concentrations of acetone and methylene chloride are an artifact of laboratory contamination.

Acetone and methylene chloride are listed in Title 22, Section 66680 as hazardous for their potential ignitability. The ignitability test results previously described demonstrate that sample EM4 is not hazardous according to ignitability criteria. Methylene chloride is also listed in Section 66680 as hazardous according to its potential toxicity. The calculated oral LD50 for methylene chloride was calculated according to the equation provided in Section 66696. The RAT LD50 was 2000 milligrams/kilogram (mg/Kg) (Health Assessment Document for Dichloromethane (methylene chloride) EPA 600/87-004F). The calculated oral RAT LD50 value is 2.5×10^{11} mg/Kg. The calculated acute oral LD50 for methylene chloride is greater than 5000 mg/Kg critical value therefore, methylene chloride in the waste sample does not meet the toxic and hazardous waste criteria according to Section 66696 (a) (1) of Title 22. Methylene chloride was the only halogenated volatile organic compound detected. The concentration of methylene chloride (800 ug/Kg) measured in sample EM4 is far less than the criteria concentration of 1000 mg/Kg for total halogenated organic compounds according to Section 66900 (e) of Title 22.

The only priority pollutant organic compound detected in the mass spectrometry scan for semivolatile organic compounds in the asphalt-like material samples was 2-methylnaphthalene (220 mg/Kg). This compound was

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detected only in the sample W5. Five additional petroleum constituents associated with asphalt were also identified in the library scan of this sample. The identified compounds are trimethyldodecane, dimethylnaphthalene, trimethylnaphthalene, tetramethylpentadecane, and tetra-methylhexadecane. None of the six semivolatile chemicals identified is included in the list of chemical names in Section 66680 of Title 22.

The results of the bioassay tests on samples E1, EM4 and W5 indicated that the 96-hour LC50 for fathead minnows was greater than 500 mg/L. Therefore, samples E1, EM4 and W5 do not meet the criteria for toxicity under Section 66696 (a) (4).

CONCLUSION

Based upon the analysis of the soil and floating material samples of the asphalt-like substance from the Marketplace and Nielson sites, this material can not be classified as hazardous according to the criteria set forth in CCR, Title 22, Article 11. Therefore, this material can be managed as a nonhazardous waste according to California CCR.

If you have any questions or comment or require any additional information, please do not hesitate to contact us.

Very truly yours,

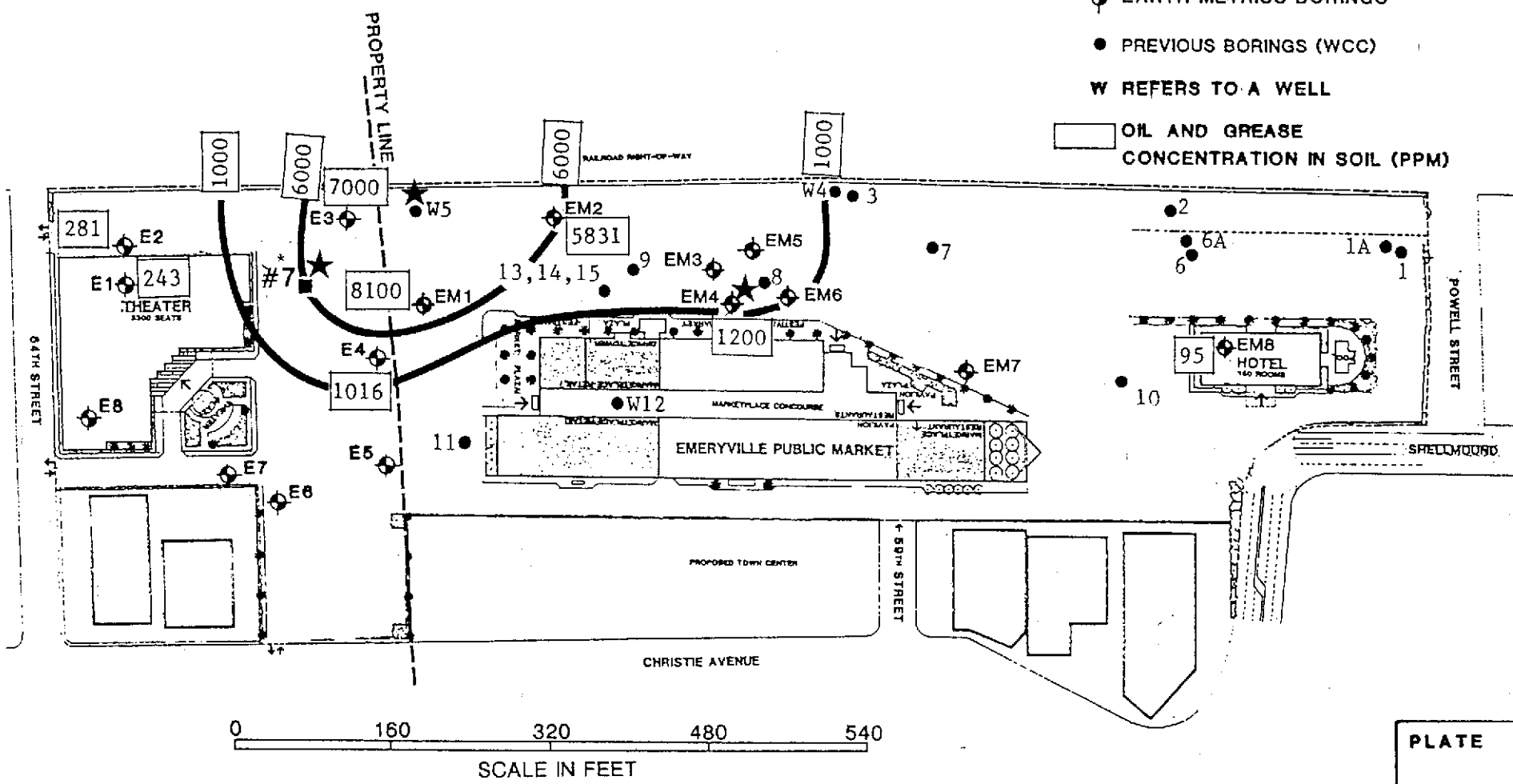
AQUA TERRA TECHNOLOGIES, INC.



Patrick Sheehan, Ph.D.
Environmental Toxicologist

PJS/pd
Attachments

- ★ WASTE CHARACTERIZATION SAMPLING LOCATION
- TEST PIT
- ⊕ EARTH METRICS BORINGS
- PREVIOUS BORINGS (WCC)
- W REFERS TO A WELL
- OIL AND GREASE CONCENTRATION IN SOIL (PPM)



* Sample identified as E1(TP6)(#7) on the chain of custody and E1 on the laboratory reports.
 Source: Earth Metrics March 11, 1988

PLATE
1

<h1>ATT</h1> <p>Aqua Terra Technologies Consulting Engineers & Scientists</p>	<p>WASTE CHARACTERIZATION SAMPLING LOCATION</p>	<p>THE MARTIN COMPANY</p>	
		<p>JOB NUMBER 834</p>	<p>DATE 7-8-88</p>



SEQUOIA Analytical Laboratory

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Aqua Terra Technologies
2950 Buskirk Ave., Suite 120
Walnut Creek, CA 94596
Attn: Patrick Sheehan

Date Sampled: 06/06/88
Date Received: 06/24/88
Date Reported: 07/05/88

<u>Sample Number</u>	<u>Sample Description</u>	<u>Ignitability</u> Flashpoint, °C
8061961	Liquid, W5	90
8061962	Soil, Em4	> 110
8061963	Soil, E1	> 110

SEQUOIA ANALYTICAL LABORATORY

Arthur G. Burton
Laboratory Director



SEQUOIA Analytical Laboratory

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Attn: Patrick Sheehan

Date Sampled: 06/06/88
Date Received: 06/24/88
Date Reported: 07/05/88

<u>Sample Number</u>	<u>Sample Description</u>	<u>pH (Corositivity)</u>
8061961	Liquid, W5	7.0
8061962	Soil, Em4	8.8
8061963	Soil, E1	7.0

SEQUOIA ANALYTICAL LABORATORY

A handwritten signature in black ink, appearing to read 'A. G. Burton', written over a horizontal line.

Arthur G. Burton
Laboratory Director



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Attn: Patrick Sheehan

Date Sampled: 06/06/88
Date Received: 06/24/88
Date Extracted: 06/28-30/88
Date Reported: 07/05/88

Sample Number: 8061961
Sample Description: Liquid, W5

WASTE EXTRACTION TEST INORGANIC SUBSTANCES

Analysis	STLC, mg/L		TTLC, mg/kg-wet wt.	
	Limit	Result	Limit	Result
Antimony	15	-	500	< 5
Arsenic	5	-	500	1.3
Asbestos	-	-	10,000	-
Barium	100	-	10,000	1.7
Beryllium	0.75	-	75	< 0.1
Cadmium	1	-	100	0.13
Chromium (VI)	5	-	500	< 0.05
Chromium (III)	560	-	2,500	0.75
Cobalt	80	-	8,000	< 0.1
Copper	25	-	2,500	0.35
Fluoride	180	-	18,000	-
Lead	5	-	1,000	2.9
Mercury	0.2	-	20	< 0.01
Molybdenum	350	-	3,500	< 5
Nickel	20	-	2,000	3.5
Selenium	1	-	100	0.26
Silver	5	-	500	< 0.1
Thallium	7	-	700	< 5
Vanadium	24	-	2,400	5.1
Zinc	250	-	5,000	1.4

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Laboratory Director



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Attn: Patrick Sheehan

Date Sampled: 06/06/88
Date Received: 06/24/88
Date Extracted: 06/28-30/88
Date Reported: 07/05/88

Sample Number: 8061962
Sample Description: Soil, Em4

WASTE EXTRACTION TEST INORGANIC SUBSTANCES

Analysis	STLC, mg/L		TTLC, mg/kg-wet wt.	
	Limit	Result	Limit	Result
Antimony	15	--	500	< 5
Arsenic	5	-	500	6.1
Asbestos	-	-	10,000	-
Barium	100	-	10,000	66
Beryllium	0.75	-	75	0.38
Cadmium	1	-	100	0.22
Chromium (VI)	5	-	500	< 0.05
Chromium (III)	560	-	2,500	17
Cobalt	80	-	8,000	5.9
Copper	25	-	2,500	49
Fluoride	180	-	18,000	-
Lead	5	-	1,000	9.5
Mercury	0.2	-	20	0.058
Molybdenum	350	-	3,500	< 5
Nickel	20	-	2,000	31
Selenium	1	-	100	0.51
Silver	5	-	500	0.47
Thallium	7	-	700	< 5
Vanadium	24	-	2,400	42
Zinc	250	-	5,000	200

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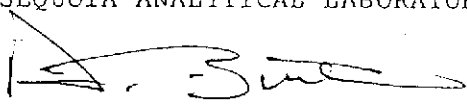
Date Sampled: 06/06/88
Date Received: 06/24/88
Date Extracted: 06/28-30/88
Date Reported: 07/05/88

Sample Number: 8061963
Sample Description: Soil, El

WASTE EXTRACTION TEST INORGANIC SUBSTANCES

Analysis	STLC, mg/L		TTLC, mg/kg-wet wt.	
	Limit	Result	Limit	Result
Antimony	15	-	500	< 5
Arsenic	5	-	500	10
Asbestos	-	-	10,000	-
Barium	100	-	10,000	130
Beryllium	0.75	-	75	0.30
Cadmium	1	-	100	0.30
Chromium (VI)	5	-	500	< 0.05
Chromium (III)	560	-	2,500	30
Cobalt	80	-	8,000	6.3
Copper	25	-	2,500	16
Fluoride	180	-	18,000	-
Lead	5	-	1,000	0.95
Mercury	0.2	-	20	0.038
Molybdenum	350	-	3,500	< 5
Nickel	20	-	2,000	28
Selenium	1	-	100	0.51
Silver	5	-	500	0.28
Thallium	7	-	700	< 5
Vanadium	24	-	2,400	27
Zinc	250	-	5,000	110

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Attn: Patrick Sheehan

Date Sampled: 06/06/88
Date Received: 06/24/88
Date Analyzed: 07/05/88
Date Reported: 07/05/88

Sample Number: 8061961

Sample Description: Liquid, W5

VOLATILE ORGANICS by MASS SPECTROMETRY

<u>Analyte</u>	<u>Detection Limit, µg/kg</u>	<u>Sample Results, µg/kg</u>
Acetone.....	50000	N.D.
Benzene.....	10000	N.D.
Bromodichloromethane.....	10000	N.D.
Bromoform.....	10000	N.D.
Bromomethane.....	10000	N.D.
2-Butanone.....	50000	N.D.
Carbon disulfide.....	10000	N.D.
Carbon tetrachloride.....	10000	N.D.
Chlorobenzene.....	10000	N.D.
Chlorodibromomethane.....	10000	N.D.
Chloroethane.....	10000	N.D.
2-Chloroethyl vinyl ether.....	50000	N.D.
Chloroform.....	50000	N.D.
Chloromethane.....	10000	N.D.
1,1-Dichloroethane.....	10000	N.D.
1,2-Dichloroethane.....	10000	N.D.
1,1-Dichloroethene.....	10000	N.D.
Total-1,2-Dichloroethene.....	10000	N.D.
1,2-Dichloropropane.....	10000	N.D.
cis-1,3-Dichloropropene.....	10000	N.D.
trans-1,3-Dichloropropene.....	10000	N.D.
Ethylbenzene.....	10000	N.D.
2-Hexanone.....	50000	N.D.
Methylene chloride.....	50000	N.D.
4-Methyl-2-pentanone.....	50000	N.D.
Styrene.....	10000	N.D.
1,1,2,2-Tetrachloroethane.....	10000	N.D.
Tetrachloroethene.....	10000	N.D.
Toluene.....	10000	N.D.
1,1,1-Trichloroethane.....	10000	N.D.
1,1,2-Trichloroethane.....	10000	N.D.
Trichloroethene.....	10000	N.D.
Trichlorofluoromethane.....	10000	N.D.
Vinyl acetate.....	10000	N.D.
Vinyl chloride.....	10000	N.D.
Total Xylenes.....	10000	N.D.

Method of Analysis: EPA 5030/8240

Analytes reported as N.D. were not present above the stated limit of detection.

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Attn: Patrick Sheehan

Date Sampled: 06/06/88
Date Received: 06/24/88
Date Analyzed: 07/05/88
Date Reported: 07/05/88

Sample Number: 8061962

Sample Description: Soil, EM4


VOLATILE ORGANICS by MASS SPECTROMETRY

<u>Analyte</u>	<u>Detection Limit, µg/kg</u>	<u>Sample Results, µg/kg</u>
Acetone.....	500	2500
Benzene.....	100	N.D.
Bromodichloromethane.....	100	N.D.
Bromoform.....	100	N.D.
Bromomethane.....	100	N.D.
2-Butanone.....	500	N.D.
Carbon disulfide.....	100	N.D.
Carbon tetrachloride.....	100	N.D.
Chlorobenzene.....	100	N.D.
Chlorodibromomethane.....	100	N.D.
Chloroethane.....	100	N.D.
2-Chloroethyl vinyl ether.....	500	N.D.
Chloroform.....	500	N.D.
Chloromethane.....	100	N.D.
1,1-Dichloroethane.....	100	N.D.
1,2-Dichloroethane.....	100	N.D.
1,1-Dichloroethene.....	100	N.D.
Total-1,2-Dichloroethene.....	100	N.D.
1,2-Dichloropropane.....	100	N.D.
cis-1,3-Dichloropropene.....	100	N.D.
trans-1,3-Dichloropropene.....	100	N.D.
Ethylbenzene.....	100	N.D.
2-Hexanone.....	500	N.D.
Methylene chloride.....	500	800
4-Methyl-2-pentanone.....	500	N.D.
Styrene.....	100	N.D.
1,1,2,2-Tetrachloroethane.....	100	N.D.
Tetrachloroethene.....	100	N.D.
Toluene.....	100	N.D.
1,1,1-Trichloroethane.....	100	N.D.
1,1,2-Trichloroethane.....	100	N.D.
Trichloroethene.....	100	N.D.
Trichlorofluoromethane.....	100	N.D.
Vinyl acetate.....	100	N.D.
Vinyl chloride.....	100	N.D.
Total Xylenes.....	100	N.D.

Method of Analysis: EPA 5030/8240

Analytes reported as N.D. were not present above the stated limit of detection.

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Date Sampled: 06/06/88
Date Received: 06/24/88
Date Analyzed: 07/05/88
Date Reported: 07/05/88

Sample Number: 8061963

Sample Description: Soil, El

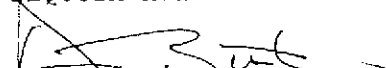
VOLATILE ORGANICS by MASS SPECTROMETRY

<u>Analyte</u>	<u>Detection Limit, µg/kg</u>	<u>Sample Results, µg/kg</u>
Acetone.....	500	N.D.
Benzene.....	100	N.D.
Bromodichloromethane.....	100	N.D.
Bromoform.....	100	N.D.
Bromomethane.....	100	N.D.
2-Butanone.....	500	N.D.
Carbon disulfide.....	100	N.D.
Carbon tetrachloride.....	100	N.D.
Chlorobenzene.....	100	N.D.
Chlorodibromomethane.....	100	N.D.
Chloroethane.....	100	N.D.
2-Chloroethyl vinyl ether.....	500	N.D.
Chloroform.....	500	N.D.
Chloromethane.....	100	N.D.
1,1-Dichloroethane.....	100	N.D.
1,2-Dichloroethane.....	100	N.D.
1,1-Dichloroethene.....	100	N.D.
Total-1,2-Dichloroethene.....	100	N.D.
1,2-Dichloropropane.....	100	N.D.
cis-1,3-Dichloropropene.....	100	N.D.
trans-1,3-Dichloropropene.....	100	N.D.
Ethylbenzene.....	100	N.D.
2-Hexanone.....	500	N.D.
Methylene chloride.....	500	N.D.
4-Methyl-2-pentanone.....	500	N.D.
Styrene.....	100	N.D.
1,1,2,2-Tetrachloroethane.....	100	N.D.
Tetrachloroethene.....	100	N.D.
Toluene.....	100	N.D.
1,1,1-Trichloroethane.....	100	N.D.
1,1,2-Trichloroethane.....	100	N.D.
Trichloroethene.....	100	N.D.
Trichlorofluoromethane.....	100	N.D.
Vinyl acetate.....	100	N.D.
Vinyl chloride.....	100	N.D.
Total Xylenes.....	100	N.D.

Method of Analysis: EPA 5030/8240

Analytes reported as N.D. were not present above the stated limit of detection.

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Arthur G. Burton
Laboratory Director



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Attn: Patrick Sheehan

Date Sampled: 06/06/88
Date Received: 06/24/88
Date Extracted: 06/30/88
Date Analyzed: 06/30/88
Date Reported: 07/05/88

Sample Number

8061961

Sample Description

Liquid, W5

SEMI-VOLATILE ORGANICS by MASS SPECTROMETRY

<u>Analyte</u>	<u>Detection Limit</u>	<u>Sample Results</u>
	µg/kg	µg/kg
Acenaphthene.....	200000	N.D.
Acenaphthylene.....	200000	N.D.
Anthracene.....	200000	N.D.
Benzidine.....	5000000	N.D.
Benzoic acid.....	200000	N.D.
Benzo(a)anthracene.....	200000	N.D.
Benzo(b)fluoranthene.....	200000	N.D.
Benzo(k)fluoranthene.....	200000	N.D.
Benzo(g,h,i)perylene.....	200000	N.D.
Benzo(a)pyrene.....	200000	N.D.
Benzyl alcohol.....	200000	N.D.
Bis(2-chloroethoxy)methane.....	200000	N.D.
Bis(2-chloroethyl)ether.....	200000	N.D.
Bis(2-chloroisopropyl)ether.....	200000	N.D.
Bis(2-ethylhexyl)phthalate.....	1000000	N.D.
4-Bromophenyl phenyl ether.....	200000	N.D.
Butyl benzyl phthalate.....	200000	N.D.
4-Chloroaniline.....	200000	N.D.
2-Chloronaphthalene.....	200000	N.D.
4-Chloro-3-methylphenol.....	200000	N.D.
2-Chlorophenol.....	200000	N.D.
4-Chlorophenyl phenyl ether.....	200000	N.D.
Chrysene.....	200000	N.D.
Dibenz(a,h)anthracene.....	200000	N.D.
Dibenzofuran.....	200000	N.D.
Di-N-butyl phthalate.....	1000000	N.D.
1,3-Dichlorobenzene.....	200000	N.D.
1,4-Dichlorobenzene.....	200000	N.D.
1,2-Dichlorobenzene.....	200000	N.D.
3,3-Dichlorobenzidine.....	1000000	N.D.
2,4-Dichlorophenol.....	200000	N.D.
Diethyl phthalate.....	200000	N.D.
2,4-Dimethylphenol.....	200000	N.D.
Dimethyl phthalate.....	200000	N.D.
4,6-Dinitro-2-methylphenol.....	1000000	N.D.
2,4-Dinitrophenol.....	1000000	N.D.
2,4-Dinitrotoluene.....	200000	N.D.
2,6-Dinitrotoluene.....	200000	N.D.



SEQUOIA Analytical Laboratory

2549 Middlefield Road
Redwood City, CA 94063 • (415) 364-9222 • FAX (415) 364-9233

Aqua Terra Technologies

Sample Number
8061961

Sample Description
Liquid, W5

SEMI-VOLATILE ORGANICS by MASS SPECTROMETRY

<u>Analyte</u>	<u>Detection Limit</u> µg/kg	<u>Sample Results</u> µg/kg
Di-N-octyl phthalate.....	200000	N.D.
Fluoranthene.....	200000	N.D.
Fluorene.....	200000	N.D.
Hexachlorobenzene.....	200000	N.D.
Hexachlorobutadiene.....	200000	N.D.
Hexachlorocyclopentadiene.....	200000	N.D.
Hexachloroethane.....	200000	N.D.
Indeno(1,2,3-cd)pyrene.....	200000	N.D.
Isophorone.....	200000	N.D.
2-Methylnaphthalene.....	200000	220000
2-Methylphenol.....	200000	N.D.
4-Methylphenol.....	200000	N.D.
Naphthalene.....	200000	N.D.
2-Nitroaniline.....	200000	N.D.
3-Nitroaniline.....	200000	N.D.
4-Nitroaniline.....	200000	N.D.
Nitrobenzene.....	200000	N.D.
2-Nitrophenol.....	200000	N.D.
4-Nitrophenol.....	1000000	N.D.
N-Nitrosodiphenylamine.....	200000	N.D.
N-Nitroso-di-N-propylamine.....	200000	N.D.
Pentachlorophenol.....	1000000	N.D.
Phenanthrene.....	200000	N.D.
Phenol.....	200000	N.D.
Pyrene.....	200000	N.D.
1,2,4-Trichlorobenzene.....	200000	N.D.
2,4,5-Trichlorophenol.....	200000	N.D.
2,4,6-Trichlorophenol.....	200000	N.D.

Method of Extraction: EPA 3580

Method of Analysis: EPA 8270

Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL LABORATORY

Arthur G. Burton
Laboratory Director



SEQUOIA Analytical Laboratory

2549 Middlefield Road
Redwood City, CA 94063 • (415) 364-9222 • FAX (415) 364-9233

Aqua Terra Technologies
2950 Buskirk Ave., Suite 120
Walnut Creek, CA 94596
Attn: Patrick Sheehan

Date Sampled: 06/06/88
Date Received: 06/24/88
Date Extracted: 06/29/88
Date Analyzed: 06/30/88
Date Reported: 07/05/88

Sample Number

8061961

Sample Description

Liquid, W5

SEMI-VOLATILE ORGANICS by MASS SPECTROMETRY

Non-Calibrated Compounds

<u>Analyte</u>	<u>Concentration</u> µg/kg
Trimethyl Dodecane	1100000
Dimethyl Naphthalene	500000
Trimethyl Naphthalene	2000000
Tetramethyl Pentadecane	1400000
Tetramethyl Hexadecane	2700000

Method of Analysis: EPA 8270 & "Open Scan"

NOTE: All identifications are tentative and concentrations are estimates based upon spectral comparison to the EPA/NIH library. Positive identification or specification between isomers cannot be made without retention time standards.

SEQUOIA ANALYTICAL LABORATORY

Arthur G. Burton
Laboratory Director



SEQUOIA Analytical Laboratory

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Aqua Terra Technologies
2950 Buskirk Ave., Suite 120
Walnut Creek, CA 94596
Attn: Patrick Sheehan

Date Sampled: 06/06/88
Date Received: 06/24/88
Date Extracted: 06/29/88
Date Analyzed: 06/30/88
Date Reported: 07/05/88

Sample Number

8061962

Sample Description

Soil, EM4

SEMI-VOLATILE ORGANICS by MASS SPECTROMETRY

<u>Analyte</u>	<u>Detection Limit</u>	<u>Sample Results</u>
	$\mu\text{g}/\text{kg}$	$\mu\text{g}/\text{kg}$
Acenaphthene.....	20000	N.D.
Acenaphthylene.....	20000	N.D.
Anthracene.....	20000	N.D.
Benzidine.....	500000	N.D.
Benzoic acid.....	20000	N.D.
Benzo(a)anthracene.....	20000	N.D.
Benzo(b)fluoranthene.....	20000	N.D.
Benzo(k)fluoranthene.....	20000	N.D.
Benzo(g,h,i)perylene.....	20000	N.D.
Benzo(a)pyrene.....	20000	N.D.
Benzyl alcohol.....	20000	N.D.
Bis(2-chloroethoxy)methane.....	20000	N.D.
Bis(2-chloroethyl)ether.....	20000	N.D.
Bis(2-chloroisopropyl)ether.....	20000	N.D.
Bis(2-ethylhexyl)phthalate.....	100000	N.D.
4-Bromophenyl phenyl ether.....	20000	N.D.
Butyl benzyl phthalate.....	20000	N.D.
4-Chloroaniline.....	20000	N.D.
2-Chloronaphthalene.....	20000	N.D.
4-Chloro-3-methylphenol.....	20000	N.D.
2-Chlorophenol.....	20000	N.D.
4-Chlorophenyl phenyl ether.....	20000	N.D.
Chrysene.....	20000	N.D.
Dibenz(a,h)anthracene.....	20000	N.D.
Dibenzofuran.....	20000	N.D.
Di-N-butyl phthalate.....	100000	N.D.
1,3-Dichlorobenzene.....	20000	N.D.
1,4-Dichlorobenzene.....	20000	N.D.
1,2-Dichlorobenzene.....	20000	N.D.
3,3-Dichlorobenzidine.....	100000	N.D.
2,4-Dichlorophenol.....	20000	N.D.
Diethyl phthalate.....	20000	N.D.
2,4-Dimethylphenol.....	20000	N.D.
Dimethyl phthalate.....	20000	N.D.
4,6-Dinitro-2-methylphenol.....	100000	N.D.
2,4-Dinitrophenol.....	100000	N.D.
2,4-Dinitrotoluene.....	20000	N.D.
2,6-Dinitrotoluene.....	20000	N.D.



SEQUOIA Analytical Laboratory

2549 Middlefield Road
Redwood City, CA 94063 • (415) 364-9222 • FAX (415) 364-9233

Aqua Terra Technologies

Sample Number

8061962

Sample Description

Soil, EM4

SEMI-VOLATILE ORGANICS by MASS SPECTROMETRY

<u>Analyte</u>	<u>Detection Limit</u> µg/kg	<u>Sample Results</u> µg/kg
Di-N-octyl phthalate.....	20000	N.D.
Fluoranthene.....	20000	N.D.
Fluorene.....	20000	N.D.
Hexachlorobenzene.....	20000	N.D.
Hexachlorobutadiene.....	20000	N.D.
Hexachlorocyclopentadiene.....	20000	N.D.
Hexachloroethane.....	20000	N.D.
Indeno(1,2,3-cd)pyrene.....	20000	N.D.
Isophorone.....	20000	N.D.
2-Methylnaphthalene.....	20000	N.D.
2-Methylphenol.....	20000	N.D.
4-Methylphenol.....	20000	N.D.
Naphthalene.....	20000	N.D.
2-Nitroaniline.....	20000	N.D.
3-Nitroaniline.....	20000	N.D.
4-Nitroaniline.....	20000	N.D.
Nitrobenzene.....	20000	N.D.
2-Nitrophenol.....	20000	N.D.
4-Nitrophenol.....	20000	N.D.
N-Nitrosodiphenylamine.....	20000	N.D.
N-Nitroso-di-N-propylamine.....	20000	N.D.
Pentachlorophenol.....	20000	N.D.
Phenanthrene.....	20000	N.D.
Phenol.....	20000	N.D.
Pyrene.....	20000	N.D.
1,2,4-Trichlorobenzene.....	20000	N.D.
2,4,5-Trichlorophenol.....	20000	N.D.
2,4,6-Trichlorophenol.....	20000	N.D.

Method of Extraction: EPA 3550

Method of Analysis: EPA 8270

Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL LABORATORY

Arthur G. Burton
Laboratory Director



SEQUOIA Analytical Laboratory

2549 Middlefield Road
Redwood City, CA 94063 • (415) 364-9222 • FAX (415) 364-9233

Aqua Terra Technologies
2950 Buskirk Ave., Suite 120
Walnut Creek, CA 94596
Attn: Patrick Sheehan

Date Sampled: 06/06/88
Date Received: 06/24/88
Date Extracted: 06/29/88
Date Analyzed: 06/30/88
Date Reported: 07/05/88

Sample Number

8061962

Sample Description

Soil, EM4

SEMI-VOLATILE ORGANICS by MASS SPECTROMETRY

Non-Calibrated Compounds

Analyte

Concentration

µg/kg

No additional peaks > 500 µg/kg were identified by the Mass Spectral library.

Method of Analysis: EPA 8270 & "Open Scan"

NOTE: All identifications are tentative and concentrations are estimates based upon spectral comparison to the EPA/NIH library. Positive identification or specification between isomers cannot be made without retention time standards.

SEQUOIA ANALYTICAL LABORATORY

Arthur G. Burton
Laboratory Director



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Aqua Terra Technologies
2950 Buskirk Ave., Suite 120
Walnut Creek, CA 94596
Attn: Patrick Sheehan

Date Sampled: 06/06/88
Date Received: 06/24/88
Date Extracted: 06/29/88
Date Analyzed: 06/30/88
Date Reported: 07/05/88

Sample Number

8061963

Sample Description

Soil, El

SEMI-VOLATILE ORGANICS by MASS SPECTROMETRY

<u>Analyte</u>	<u>Detection Limit</u>	<u>Sample Results</u>
	$\mu\text{g}/\text{kg}$	$\mu\text{g}/\text{kg}$
Acenaphthene.....	10000	N.D.
Acenaphthylene.....	10000	N.D.
Anthracene.....	10000	N.D.
Benzidine.....	250000	N.D.
Benzoic acid.....	10000	N.D.
Benzo(a)anthracene.....	10000	N.D.
Benzo(b)fluoranthene.....	10000	N.D.
Benzo(k)fluoranthene.....	10000	N.D.
Benzo(g,h,i)perylene.....	10000	N.D.
Benzo(a)pyrene.....	10000	N.D.
Benzyl alcohol.....	10000	N.D.
Bis(2-chloroethoxy)methane.....	10000	N.D.
Bis(2-chloroethyl)ether.....	10000	N.D.
Bis(2-chloroisopropyl)ether.....	10000	N.D.
Bis(2-ethylhexyl)phthalate.....	50000	N.D.
4-Bromophenyl phenyl ether.....	10000	N.D.
Butyl benzyl phthalate.....	10000	N.D.
4-Chloroaniline.....	10000	N.D.
2-Chloronaphthalene.....	10000	N.D.
4-Chloro-3-methylphenol.....	10000	N.D.
2-Chlorophenol.....	10000	N.D.
4-Chlorophenyl phenyl ether.....	10000	N.D.
Chrysene.....	10000	N.D.
Dibenz(a,h)anthracene.....	10000	N.D.
Dibenzofuran.....	10000	N.D.
Di-N-butyl phthalate.....	50000	N.D.
1,3-Dichlorobenzene.....	10000	N.D.
1,4-Dichlorobenzene.....	10000	N.D.
1,2-Dichlorobenzene.....	10000	N.D.
3,3-Dichlorobenzidine.....	50000	N.D.
2,4-Dichlorophenol.....	10000	N.D.
Diethyl phthalate.....	10000	N.D.
2,4-Dimethylphenol.....	10000	N.D.
Dimethyl phthalate.....	10000	N.D.
4,6-Dinitro-2-methylphenol.....	50000	N.D.
2,4-Dinitrophenol.....	50000	N.D.
2,4-Dinitrotoluene.....	10000	N.D.
2,6-Dinitrotoluene.....	10000	N.D.



SEQUOIA Analytical Laboratory

2549 Middlefield Road
Redwood City, CA 94063 • (415) 364-9222 • FAX (415) 364-9233

Aqua Terra Technologies

Sample Number

8061963

Sample Description

Soil, El

SEMI-VOLATILE ORGANICS by MASS SPECTROMETRY

<u>Analyte</u>	<u>Detection Limit</u> µg/kg	<u>Sample Results</u> µg/kg
Di-N-octyl phthalate.....	10000	N.D.
Fluoranthene.....	10000	N.D.
Fluorene.....	10000	N.D.
Hexachlorobenzene.....	10000	N.D.
Hexachlorobutadiene.....	10000	N.D.
Hexachlorocyclopentadiene.....	10000	N.D.
Hexachloroethane.....	10000	N.D.
Indeno(1,2,3-cd)pyrene.....	10000	N.D.
Isophorone.....	10000	N.D.
2-Methylnaphthalene.....	10000	N.D.
2-Methylphenol.....	10000	N.D.
4-Methylphenol.....	10000	N.D.
Naphthalene.....	10000	N.D.
2-Nitroaniline.....	10000	N.D.
3-Nitroaniline.....	10000	N.D.
4-Nitroaniline.....	10000	N.D.
Nitrobenzene.....	10000	N.D.
2-Nitrophenol.....	10000	N.D.
4-Nitrophenol.....	50000	N.D.
N-Nitrosodiphenylamine	10000	N.D.
N-Nitroso-di-N-propylamine.....	10000	N.D.
Pentachlorophenol.....	50000	N.D.
Phenanthrene.....	10000	N.D.
Phenol.....	10000	N.D.
Pyrene.....	10000	N.D.
1,2,4-Trichlorobenzene.....	10000	N.D.
2,4,5-Trichlorophenol.....	10000	N.D.
2,4,6-Trichlorophenol.....	10000	N.D.

Method of Extraction: EPA 3550

Method of Analysis: EPA 8270

Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL LABORATORY

Arthur G. Burton
Laboratory Director



SEQUOIA Analytical Laboratory

2549 Middlefield Road
Redwood City, CA 94063 • (415) 364-9222 • FAX (415) 364-9233

Aqua Terra Technologies
2950 Buskirk Ave., Suite 120
Walnut Creek, CA 94596
Attn: Patrick Sheehan

Date Sampled: 06/06/88
Date Received: 06/24/88
Date Extracted: 06/29/88
Date Analyzed: 06/30/88
Date Reported: 07/05/88

Sample Number

8061963

Sample Description

Soil, El

SEMI-VOLATILE ORGANICS by MASS SPECTROMETRY
Non-Calibrated Compounds

Analyte

Concentration

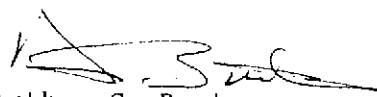
µg/kg

No additional peaks > 500 µg/kg were identified by the Mass Spectral library.

Method of Analysis: EPA 8270 & "Open Scan"

NOTE: All identifications are tentative and concentrations are estimates based upon spectral comparison to the EPA/NIH library. Positive identification or specification between isomers cannot be made without retention time standards.

SEQUOIA ANALYTICAL LABORATORY


Arthur G. Burton
Laboratory Director



SEQUOIA Analytical Laboratory

2549 Middlefield Road
Redwood City, CA 94063 • (415) 364-9222

Aqua Terra Technologies
2950 Buskirk Ave., Suite 120
Walnut Creek, CA 94596
Attn: Patrick Sheehan

Date Sampled: 06/06/88
Date Received: 06/24/88
Date Analyzed: 07/01/88
Date Reported: 07/07/88

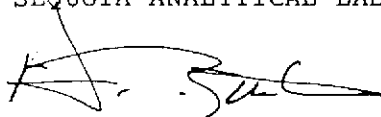
POLYCHLORINATED BIPHENYLS

<u>Sample Number</u>	<u>Sample Description</u>	<u>Detection Limit</u> µg/kg	<u>Sample Result</u> µg/kg	<u>PCB Species (If Present)</u>
8061961	Liquid, W5	100,000	N.D.	-
8061962	Soil, Em4	20,000	N.D.	-
8061963	Soil, E1	10,000	N.D.	-

Method of Analysis: EPA 8270

Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL LABORATORY


Arthur G. Burton
Laboratory Director

TR²H

Aqua Terra Technologies
Consulting Engineers & Scientists

2950 Buskirk Avenue, Suite 120
Walnut Creek, CA 94596
415 934-4884

ATT

CHAIN OF SAMPLE CUSTODY RECORD

Collector: Todd Miller Date Sampled: 6-6-88 Time: 12⁰⁰
Location of Sampling: Emerailk location - W-5

Project Number: _____ Survey Number: _____
Sample Type: Floating product
Container Type and Condition: 1 pt. wide mouth jars
Contract Laboratory Record/Name: _____

Sample ID	Field Information
EM 4	SOIL
<u>EM 4</u>	<u>SOIL</u>
<u>WS</u>	<u>LIQUID</u>
<u>(E1) 7 (TPK)</u>	<u>SOIL</u>

Analysis Requested: EPA 8240, 8270, 6010, 7000 SERIES
BIODIVERSITY
CORROSIVITY

Results Needed By: _____
Contact and results to be sent to: PATRICK SHEEHAN
Travel Blank: Yes No Travel Blank to be Analyzed Separately: Yes No
Duplicate Samples: Yes No Duplicates to be Analyzed Separately: Yes No
Cleaning Blank: Yes No Cleaning Blank to be Analyzed Separately: Yes No
Background Soil Sample: Yes No Background Soil Sample to be Analyzed Separately: Yes No

Chain of Custody:
1. Todd Miller 6/6/88
Field Personnel Date
2. Gregory 6/6/88
Courier Date
3. _____
Lab Date



July 11, 1988

Mr. Walter Kaczmarek
The Martin Company
6425 Christie Street #406
Emeryville, CA 94608

Subject: Toxicity Test Results of Sample
864(E1), 865(EM1), and 866(W5).

Dear Mr. Kaczmarek:

This letter report presents the toxicity test results for fathead minnow (Pimephales promelas) exposed to concentrations of samples of asphalt-like substance in soil and viscous asphalt-like liquid collected from the Marketplace and Nielsen sites in Emeryville, California.

METHODS

All tests were conducted according to Aqua Terra Technologies (ATT) hazardous waste aquatic toxicity test protocol based on Standard Methods for the Examination of Water and Wastewater, 16th Edition, American Public Health Association, 1986, and certified by the State of California Department of Health Services (copy of certificate attached). The asphalt-like substance in soil and viscous asphalt-like liquid samples were tested at three concentrations, 250 mg/L, 500 mg/L, and 750 mg/L. The soil samples were thoroughly mixed into dechlorinated tap water using a wrist-action shaker. The liquid sample was mechanically mixed directly with dechlorinated tap water. All treatments were run in duplicate with 10 fish per three liter tank and a total of 20 fish per treatment. Tests for soil sample 864(E1) and 865(EM1) were conducted June 6 through June 10, 1988. Test for the liquid sample 866(W5) were conducted June 20 through June 24, 1988. Fish were acclimated in the test laboratory for 6 to 7 days prior to their use in these tests. Temperature was controlled at $20 \pm 2^{\circ}\text{C}$ and photoperiod regulated at approximately 16-hours light and 8-hours dark.

Fish mortality and the following physical and chemical variables were monitored during the 96-hours test: temperature, pH, dissolved oxygen concentration, water hardness and alkalinity.

Aqua Terra Technologies
Consulting Engineers
& Scientists

2950 Buskirk Avenue
Suite 120
Walnut Creek, CA
94596
415 934-4884

Mr. Walter Kaczmarek
The Martin Company
July 11, 1988
Page Two

TEST RESULTS

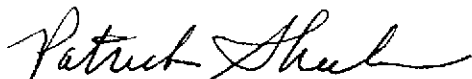
No fish mortality occurred in the dilution water control or in sample treatments of samples 864(E1) and 865(EM4). Fish mortality did occur in all sample treatments of Sample 866(W5). Twenty five percent fish mortality occurred in the 250 mg/L treatment, five percent in the 500 mg/L treatment, and 40 percent in the 750 mg/L treatment of Sample 866. The raw data from tests are summarized in the attached data sheets.

Test results indicate that the 96-hour LC50 values for the asphalt-like soil and liquid samples are greater than 500 mg/L. The soil samples 864(E1) and 865(EM4) and liquid sample 866(W5) therefore, do not meet the acute aquatic toxicity test criteria (96-hour LC50 \leq 500 mg/L) for identification of a material as hazardous according to the specification in the California Code of Regulation (CCR), Title 22, Section 66696.

Should any questions arise as to test procedures or results, do not hesitate to call.

Very truly yours,

AQUA TERRA TECHNOLOGIES, INC.



Patrick J. Sheehan, Ph.D.
Laboratory Director

PJS/pc

Enclosures: Bioassay Data Sheets
Temperature Traces
Chain of Custody
Invoice
Certificate

STATIC ACUTE BIOASSAY

Aqua Terra Technologies
 2950 Buskirk Avenue
 Walnut Creek, CA 94596
 415 934-4884

CLIENT: The Martin Company ATTENTION: Mr. Walter Kaczmarek

SAMPLE ID#: control SAMPLE DESCRIPTION: dilution water TESTING DATES: 06/06/88 to 06/10/88

TEST CONC mg/L	Monday INITIAL						Tuesday 24-HOUR				Wednesday 48-HOUR				Thursday 72-HOUR				Friday 96-HOUR			
	Alk mg/L	Hard mg/L	Live	pH	DO mg/L	Temp °C	Live	pH	DO mg/L	Temp °C	Live	pH	DO mg/L	Temp °C	Live	pH	DO mg/L	Temp °C	Live	pH	DO mg/L	Temp °C
control	70	45	10	7.72	9.2	22	10	7.73	9.2	*	10	7.76	8.5	*	10	7.78	8.6	*	10	7.87	8.6	*
control			10	7.76	8.9	22	10	7.52	8.9	*	10	7.50	8.7	*	10	7.55	8.3	*	10	7.50	8.3	*

Test Species fathead minnow Avg Length 3.8 cm Max Length 4.5 cm Min Length 3.3 cm

Source of Test Species Thomas Fish Company Avg Wt 0.70 gm Max Wt 1.25 gm Min Wt 0.44 gm
 10/tank

Species Density 20/treatment Dilution Water dechlorinated tap Test Soln Vol 3L Depth 17cm Aeration bubble

Acclimation Tank % Dead 0 Accl. Tank Water dechlorinated tap Accl. Period 7 days Accl. Temp. 20 (+/-2) deg C

REMARKS: *continuous temperature recording on disc.

TECHNICIAN: Patricia Chiang
 Patricia Chiang

96 hr LC50 N/A

95% Confidence Limits N/A

LABORATORY DIRECTOR: Patrick Sheehan
 Patrick Sheehan, PhD

Percent Survival N/A

STATIC ACUTE BIOASSAY

Aqua Terra Technologies
2950 Buskirk Avenue
Walnut Creek, CA 94596
415 934-4884

CLIENT: The Martin Company ATTENTION: Mr. Walter Kaczmarek

SAMPLE ID#: 864 (E1) SAMPLE DESCRIPTION: asphalt-like substance in soil TESTING DATES: 06/06/88 to 06/10/88

TEST CONC mg/L	Monday INITIAL						Tuesday 24-HOUR				Wednesday 48-HOUR				Thursday 72-HOUR				Friday 96-HOUR			
	Alk mg/L	Hard mg/L	Live	pH	DO mg/L	Temp oC	Live	pH	DO mg/L	Temp oC	Live	pH	DO mg/L	Temp oC	Live	pH	DO mg/L	Temp oC	Live	pH	DO mg/L	Temp oC
250 #3			10	7.55	8.5	22	10	7.54	8.5	*	10	7.68	8.9	*	10	7.75	8.8	*	10	7.77	8.0	*
250 #4			10	7.40	7.9	22	10	7.20	7.6	*	10	7.38	7.6	*	10	7.45	8.0	*	10	7.44	8.0	*
500 #5			10	7.49	7.9	22	10	7.37	7.6	*	10	7.53	8.2	*	10	7.45	8.1	*	10	7.47	7.5	*
500 #6			10	7.46	8.1	22	10	7.19	7.5	*	10	7.36	7.6	*	10	7.63	6.5	*	10	7.65	7.8	*
750 #7			10	7.46	8.4	22	10	7.42	8.2	*	10	7.34	8.2	*	10	7.75	8.1	*	10	7.50	7.7	*
750 #8			10	7.61	8.5	22	10	7.77	8.2	*	10	7.55	9.2	*	10	7.92	8.9	*	10	7.95	7.8	*

Test Species fathead minnow Avg Length 3.8 cm Max Length 4.5 cm Min Length 3.3 cm

Source of Test Species Thomas Fish Company Avg Wt 0.70 gm Max Wt 1.25 gm Min Wt 0.44 gm
10/tank

Species Density 20/treatment Dilution Water dechlorinated tap Test Soln Vol 3L Depth 17cm Aeration bubble

Acclimation Tank % Dead 0 Accl. Tank Water dechlorinated tap Accl. Period 7 days Accl. Temp. 20 (+/-2) deg C

REMARKS: *continuous temperature recording on disc.

TECHNICIAN: Patricia Chiang
Patricia Chiang

96 hr LC50 greater than 500 mg/L

95% Confidence Limits N/A

LABORATORY DIRECTOR: Patrick Sheehan
Patrick Sheehan, PhD

Percent Survival N/A

STATIC ACUTE BIOASSAY

Agua Terra Technologies
2950 Buskirk Avenue
Walnut Creek, CA 94596
415 934-4884

CLIENT: The Martin Company ATTENTION: Mr. Walter Kaczmarek

SAMPLE ID#: 865(EM4) SAMPLE DESCRIPTION: asphalt-like substance in soil TESTING DATES: 06/06/88 to 06/10/88

TEST CONC mg/L	Monday INITIAL						Tuesday 24-HOUR				Wednesday 48-HOUR				Thursday 72-HOUR				Friday 96-HOUR			
	Alk mg/L	Hard mg/L	Live	pH	DO mg/L	Temp oC	Live	pH	DO mg/L	Temp oC	Live	pH	DO mg/L	Temp oC	Live	pH	DO mg/L	Temp oC	Live	pH	DO mg/L	Temp oC
250 #9			10	7.51	8.3	22	10	7.67	8.3	*	10	7.70	9.0	*	10	7.75	9.2	*	10	7.78	8.8	*
250 #10			10	7.62	8.5	22	10	7.72	8.5	*	10	7.80	9.2	*	10	7.90	9.1	*	10	7.93	8.4	*
500 #11			10	7.38	8.9	22	10	7.65	8.8	*	10	7.71	9.2	*	10	7.76	9.1	*	10	7.80	8.9	*
500 #12			10	7.38	8.0	22	10	7.67	7.9	*	10	7.71	9.1	*	10	7.77	9.0	*	10	7.80	9.0	*
750 #13			10	7.38	7.7	22	10	7.65	7.6	*	10	7.70	9.1	*	10	7.76	9.0	*	10	7.75	8.5	*
750 #14			10	7.55	8.5	22	10	7.73	8.2	*	10	7.78	9.0	*	10	7.84	8.9	*	10	7.84	8.5	*

Test Species fathead minnow Avg Length 3.8 cm Max Length 4.5 cm Min Length 3.3 cm

Source of Test Species Thomas Fish Company Avg Wt. 0.70 gm Max Wt. 1.25 gm Min Wt. 0.44 gm
10/tank

Species Density 20/treatment Dilution Water dechlorinated tap Test Soln Vol 3L Depth 17cm Aeration bubble

Acclimation Tank % Dead 0 Accl. Tank Water dechlorinated tap Accl. Period 7 days Accl. Temp. 20 (+/-2) deg C

REMARKS: *continuous temperature recording on disc.

TECHNICIAN: Patricia Chiang
Patricia Chiang

96 hr LC50 greater than 500 mg/L

95% Confidence Limits N/A

LABORATORY DIRECTOR: Patrick Sheehan
Patrick Sheehan, PhD

Percent Survival N/A

STATIC ACUTE BIOASSAY

Aqua Terra Technologies
2950 Buskirk Avenue
Walnut Creek, CA 94596
415 934-4884

CLIENT: The Martin Company ATTENTION: Mr. Walter Kaczmarek

SAMPLE ID#: control SAMPLE DESCRIPTION: dilution water TESTING DATES: 06/20/88 to 06/24/88

	Monday INITIAL						Tuesday 24-HOUR				Wednesday 48-HOUR				Thursday 72-HOUR				Friday 96-HOUR			
TEST CONC mg/L	Alk mg/L	Hard mg/L	Live	pH	DO mg/L	Temp oC	Live	pH	DO mg/L	Temp oC	Live	pH	DO mg/L	Temp oC	Live	pH	DO mg/L	Temp oC	Live	pH	DO mg/L	Temp oC
control	70	45	10	7.84	8.1	20	10	7.64	8.7	*	10	7.49	8.2	*	10	7.56	7.8	*	10	7.47	8.5	*
control			10	7.70	8.2	20	10	7.57	8.4	*	10	7.49	7.9	*	10	7.56	8.0	*	10	7.52	8.0	*

Test Species fathead minnow Avg Length 3.5 cm Max Length 4.4 cm Min Length 3.0 cm

Source of Test Species Thomas Fish Company Avg Wt 0.51 gm Max Wt 1.06 gm Min Wt 0.31 gm
10/tank

Species Density 20/treatment Dilution Water dechlorinated tap Test Soln Vol 3L Depth 17cm Aeration bubble

Acclimation Tank % Dead 0 Accl. Tank Water dechlorinated tap Accl. Period 6 days Accl. Temp. 20 (+/-2) deg C

REMARKS: *continuous temperature recording on disc.

TECHNICIAN: Patricia Chiang
Patricia Chiang

96 hr LC50 N/A

95% Confidence Limits N/A

LABORATORY DIRECTOR: Patrick Sheehan
Patrick Sheehan, PhD

Percent Survival N/A

STATIC ACUTE BIOASSAY

Aqua Terra Technologies
2950 Buskirk Avenue
Walnut Creek, CA 94596
415 934-4884

CLIENT: The Martin Company ATTENTION: Mr. Walter Kaczmarek

SAMPLE ID#: 866(W5) SAMPLE DESCRIPTION: viscous asphalt-like liquid TESTING DATES: 06/20/88 to 06/24/88

TEST CONC mg/L	Monday INITIAL						Tuesday 24-HOUR				Wednesday 48-HOUR				Thursday 72-HOUR				Friday 96-HOUR			
	Alk mg/L	Hard mg/L	Live	pH	DO mg/L	Temp oC	Live	pH	DO mg/L	Temp oC	Live	pH	DO mg/L	Temp oC	Live	pH	DO mg/L	Temp oC	Live	pH	DO mg/L	Temp oC
250 #3			10	7.72	8.3	22	10	7.53	8.3	*	10	7.61	8.2	*	10	7.70	8.6	*	8	7.68	8.6	*
250 #4			10	7.75	8.2	22	9	7.54	8.4	*	9	7.51	8.3	*	7	7.62	8.1	*	7	7.67	8.1	*
500 #5			10	7.78	8.9	22	10	7.62	9.0	*	9	7.55	8.5	*	9	7.68	8.6	*	9	7.71	8.6	*
500 #6			10	7.78	8.8	22	10	7.65	9.1	*	10	7.58	8.6	*	10	7.65	8.6	*	10	7.69	8.5	*
750 #7			10	7.73	9.2	22	9	7.65	9.0	*	9	7.63	8.0	*	6	7.58	8.4	*	4	7.70	8.3	*
750 #8			10	7.70	8.3	22	10	7.54	8.6	*	10	7.50	8.6	*	9	7.50	8.2	*	8	7.58	8.2	*

Test Species fathead minnow Avg Length 3.5 cm Max Length 4.4 cm Min Length 3.0 cm

Source of Test Species Thomas Fish Company Avg Wt 0.51 gm Max Wt 1.06 gm Min Wt 0.31 gm
10/tank

Species Density 20/treatment Dilution Water dechlorinated tap Test Soln Vol 3L Depth 17cm Aeration bubble

Acclimation Tank % Dead 0 Accl. Tank Water dechlorinated tap Accl. Period 6 days Accl. Temp. 20 (+/-2) deg C

REMARKS: *continuous temperature recording on disc.

TECHNICIAN: Patricia Chiang
Patricia Chiang

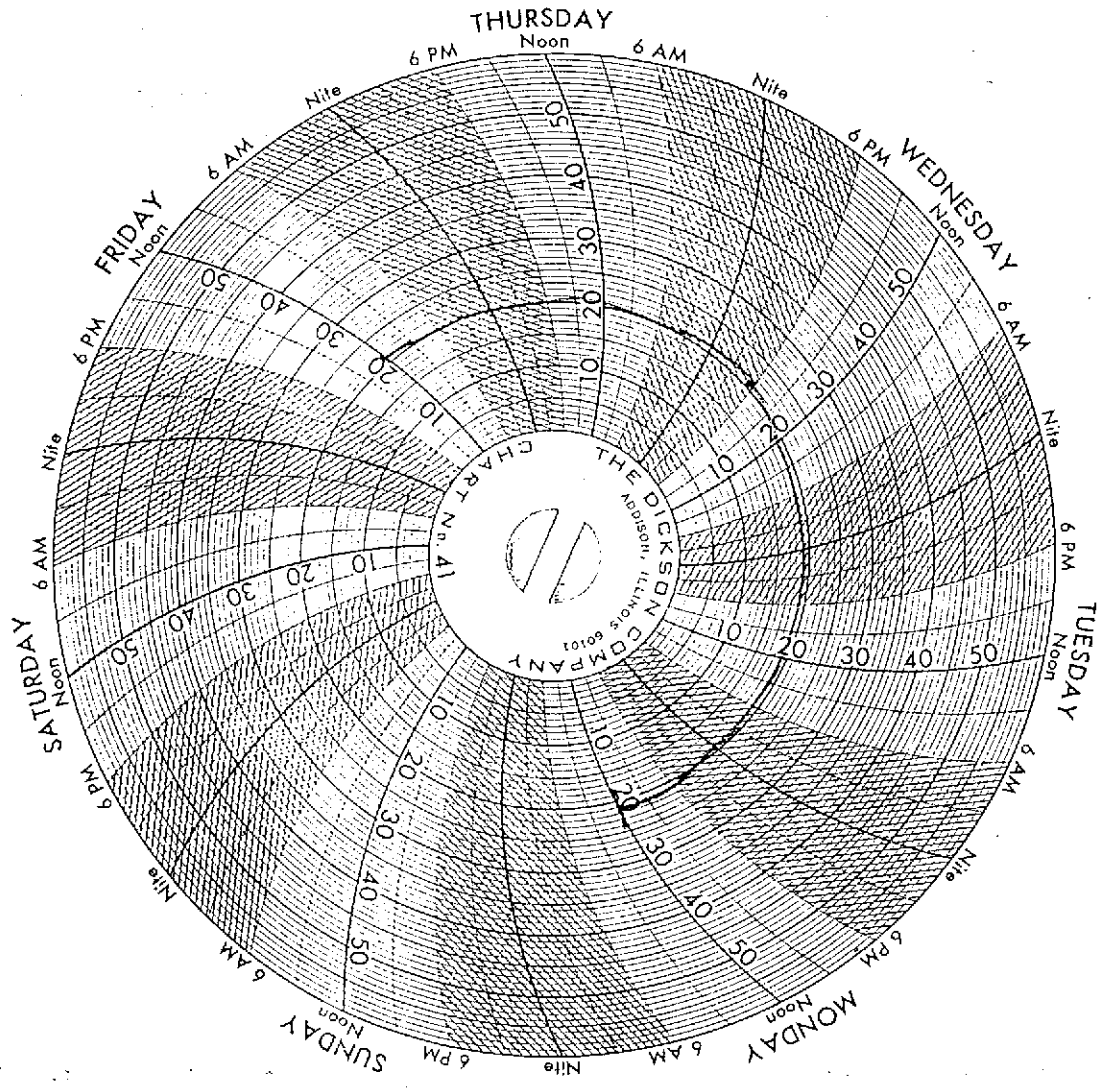
96 hr LC50 greater than 500 mg/L

95% Confidence Limits N/A

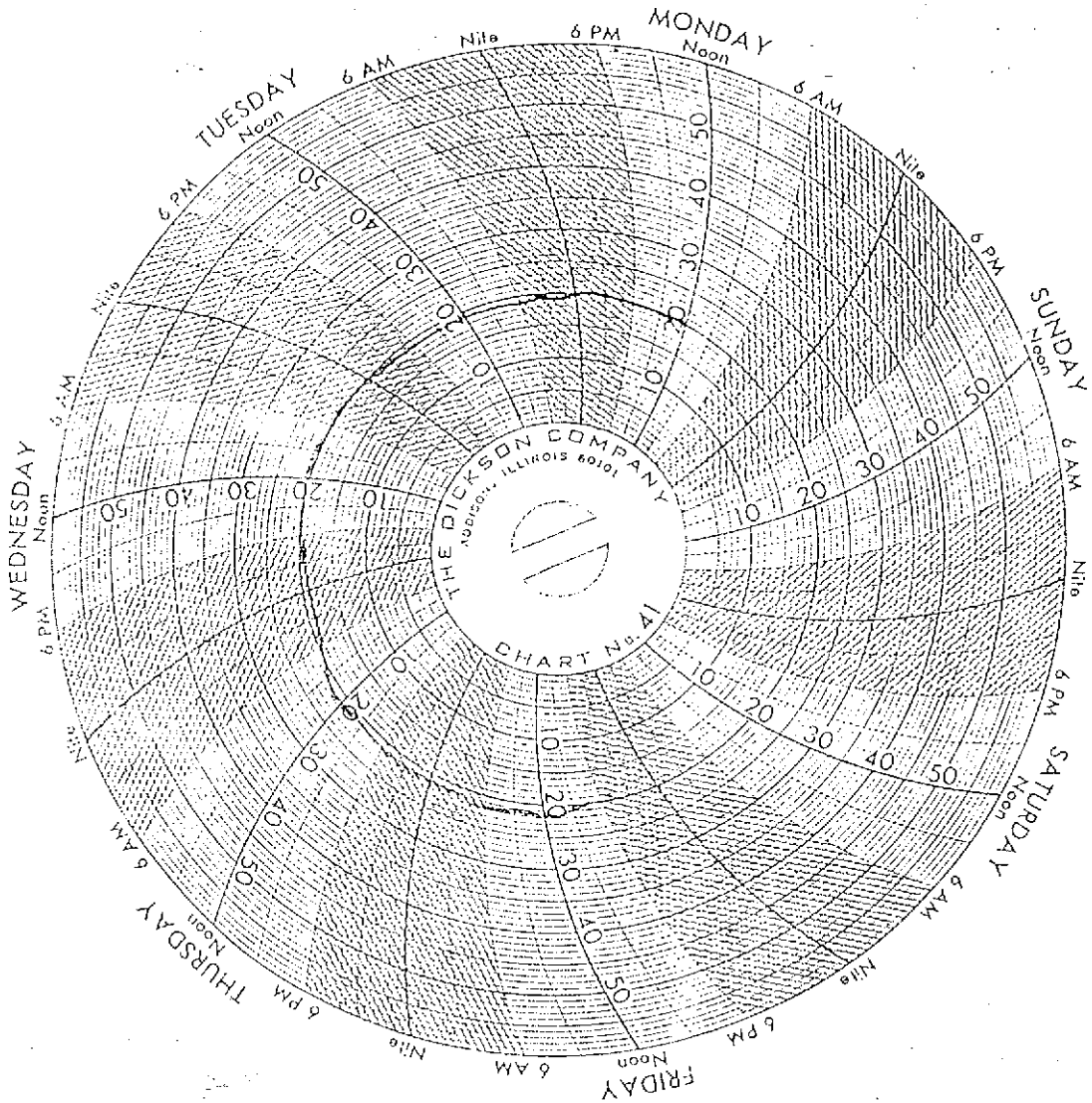
LABORATORY DIRECTOR: Patrick Sheehan
Patrick Sheehan, PhD

Percent Survival N/A

Control ✓
Sample 864, 865
June 6-10, 1988



Control
Sample 866
06/20 - 06/24



STATE OF CALIFORNIA
DEPARTMENT OF HEALTH SERVICES

HAZARDOUS WASTE TESTING LABORATORY CERTIFICATE

is hereby granted to

Aqua Terra Technologies, Inc.

to conduct analysis of hazardous waste in the following test categories:

Aquatic Toxicity Testing

This Certificate is granted in accordance with provisions of Article 8.5,
Chapter 6.5, Division 20 of the Health and Safety Code.

Certificate No. 169

Expiration Date March 2, 1989



Issued at Berkeley, on March 3, 1987

by

R. Stephens

Chief, Hazardous Materials Laboratory Section

CHAIN OF SAMPLE CUSTODY RECORD

Collector: AQUA TERRA TECH Date Sampled: 6-6-88 Time: 1200
Location of Sampling: EMERYVILLE

Project Number: 843 Survey Number: _____

Sample Type: GROUNDWATER / SOIL

Container Type and Condition: _____

Contract Laboratory Record/Name: ATT

Sample ID

Field Information

EM4

SOIL

W5

GROUNDWATER

E1 (TP6) (#7)

SOIL

Analysis Requested: BIOASSAY

Results Needed By: _____

Contact and results to be sent to: PATRICK SHEEHAN

Travel Blank: Yes No Travel Blank to be Analyzed Separately: Yes No

Duplicate Samples: Yes No Duplicates to be Analyzed Separately: Yes No

Cleaning Blank: Yes No Cleaning Blank to be Analyzed Separately: Yes No

Background Soil Sample: Yes No Background Soil Sample to be Analyzed Separately: Yes No

Chain of Custody:

- 1. Todd Mill 6/6/88
Field Personnel Date
- 2. Todd Mill 6/6/88
Courier Date
- 3. _____
Lab Date