earth metrics incorporated

May 8, 1992

RECEIVED
MAY 12 1992

Mr. John E. Miller
Law Offices of John E. Miller
250 Cambridge Avenue, Suite 102
Palo Alto, CA 94306

Subject: Limited Subsurface Soil Chemistry Analysis for 4800 Coliseum Way, Oakland, California (Earth Metrics file reference 11793A)

Dear Mr. Miller:

Enclosed herewith is Earth Metrics Limited Soil Chemistry Analysis Report for the plaster casting facility at the above-referenced location. Soil sampling at the subject site consisted of retrieving four soil samples, each collected at a depth of three feet below grade surface. Sampling was performed at the subject site on Thursday, April 2, 1992. The locations of samples collected on the subject site are shown in Figure 1, Soil Sampling Map. Soil samples were tested for the presence of lead, arsenic, petroleum oil and grease (TOG) and benzene, toluene, ethylbenzene, and xylenes (BTEX). The current analysis constitutes an independent review of previous soil and groundwater investigation performed in May and June of 1991 by Simon Environmental.

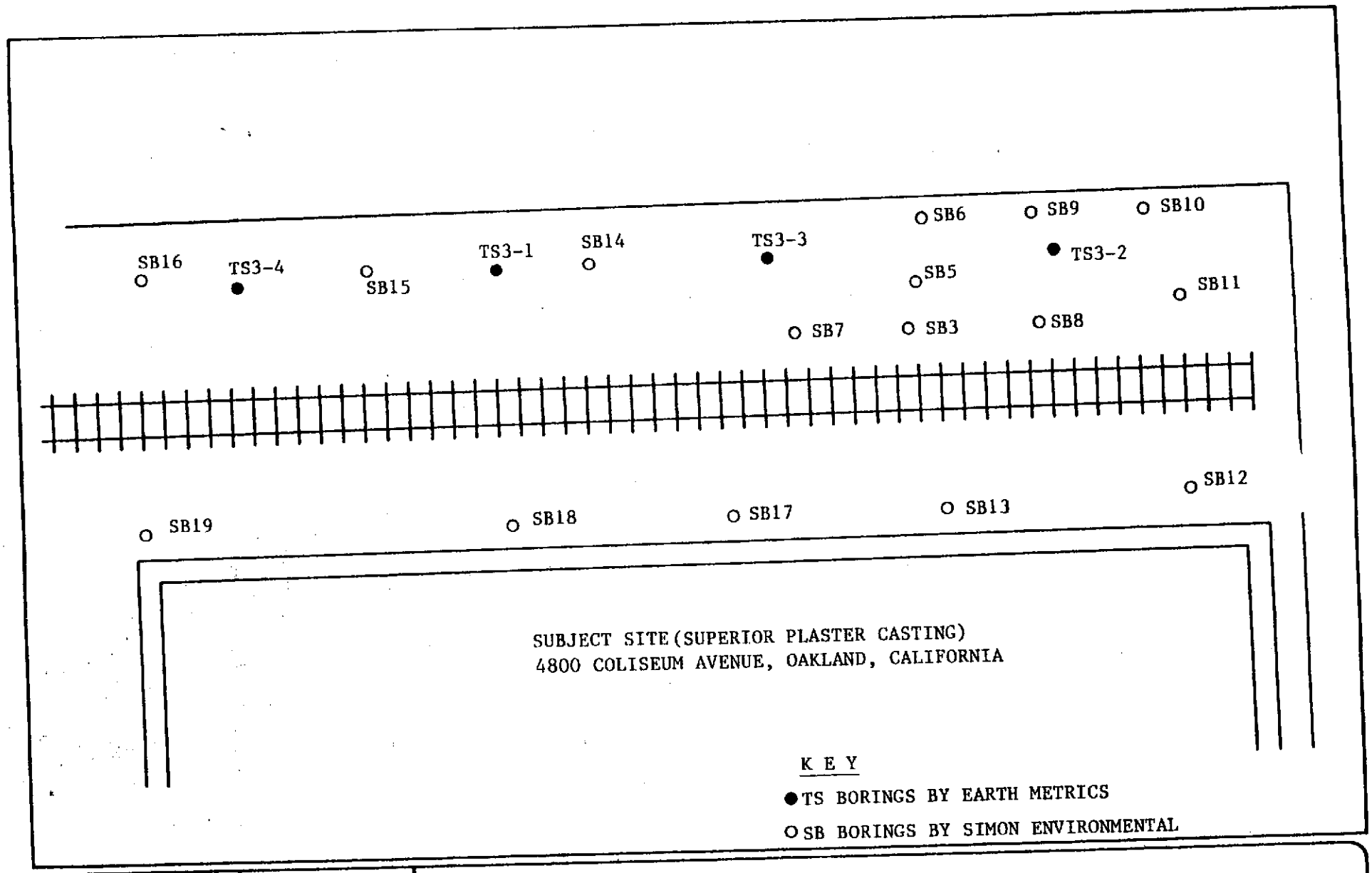
BACKGROUND

A Preliminary Environmental Site Assessment prepared by Aqua Terra Technologies in April 1991 is summarized as Attachment #1 (Aqua Terra Technologies, 1991). Previous soil and groundwater studies performed by Simon Environmental Engineering at the subject site in May and June of 1991 discovered soil containing elevated levels of petroleum hydrocarbons above 1,000 parts per million (ppm). Soil samples containing elevated petroleum hydrocarbon levels were collected behind the subject building on either side of a railroad spur. Groundwater sampling, performed by Simon Engineering, reported heavy metals, arsenic, lead, or mercury in the groundwater beneath the subject site, but the groundwater sampling methodology was not suitable for determining true groundwater quality (see Attachment #2).

The purpose of Earth Metrics soil sampling was to verify a baseline of soil chemistry. The previous studies detected heavy metals in unfiltered groundwater, samples collected from unscreened boring holes, and did not test soil samples for the presence of heavy metals in soil.

SOIL SAMPLING

Sampling Methods. Four hand-augered borings were installed at a depth of two and one-half feet below grade surface at the locations indicated in Figure 1. A driven sampler with brass liners was used to obtain relatively undisturbed soil samples. All four samples were collected at a depth of 2.5 to 3 feet. Documented chain of custody procedures were followed to ensure sample



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SCALE
NOT TO SCALE

FIGURE 1. SOIL BORING LOCATION MAP

integrity. All soil samples were collected in six-inch long brass liners and capped with aluminum, plastic caps, and tape. Immediately after sample collection, the soil samples were placed in a refrigerated ice chest. The chain of custody and the laboratory results are presented in Appendix A.

Test Results. Soil samples were analyzed by Sequoia Analytical using EPA-approved methods. Figure 1 shows the locations at which the samples were collected, while Table 1 presents the laboratory results. Samples TS3-1, TS3-2, and TS3-3 were all tested for the presence of lead and arsenic, as these heavy metals were reported in the previous Phase II assessment (Simon Environmental Engineering, 1991). The maximum detected concentration of lead in Earth Metrics three soil samples was 210 ppm in Sample TS3-2. The maximum concentration of arsenic detected in the three samples tested was 16 ppm. In comparison the California Total Threshold Limit Concentrations (TTLCs) are 1,000 ppm for lead and 500 ppm for arsenic.

Soil sample TS3-2 was also tested for the presence of BTEX. Ethylbenzene was found at a concentration of 0.05 ppm and xylene was detected at a

TABLE 1. LABORATORY RESULTS OF SOIL SAMPLES COLLECTED AT 4800 COLISEUM AVENUE, OAKLAND

SAMPLE	TS3-1	TS3-2	TS3-3	TS3-4
Arsenic (ppm)	16	14	11	--
Lead (ppm)	140	210	78	--
Total Petroleum Oil and Grease (ppm) EPA 5520 E&F	--	--	--	29,000
Benzene (ppm) EPA 8020	--	ND (0.015)	--	--
Toluene (ppm) EPA 8020	--	ND (0.015)	--	--
Ethylbenzene (ppm) EPA 8020	--	0.05	--	--
Xylene (ppm) EPA 8020	--	0.12	--	--

ND: results below detection limit stated in parentheses.
--: sample not tested for this parameter
ppm: parts per million

Source: Earth Metrics, Sequoia Analytical, 1992.

concentration of 0.12 ppm. Benzene and toluene were not detected above the detection limit of 0.015 ppm. All levels found are comparable to the laboratory detection limit of 0.015 ppm.

Sample TS3-4 was tested for the presence of total petroleum oil and grease. This sample was found to contain a concentration of 29,000 ppm total petroleum oil and grease.

DISCUSSION OF RESULTS

The Total Threshold Limit Concentration (TTLC) for lead is 1,000 parts per million per Title 22 Section 66699 of the California State Administrative Code. Materials containing lead in excess of 1,000 ppm are classified as hazardous waste. The TTLC for arsenic is 500 ppm. None of the samples tested contained concentrations of lead or arsenic in excess of the TTLC.

The detected levels of BTEX in soil sample TS3-2 are well below action levels. Soil sample TS3-4 contained a 29,000 ppm concentration of petroleum oil and grease. This sample was collected at a depth of 2.5 to 3 feet below grade surface.

The detected levels of arsenic and lead in soil may or may not be distinguishable from ambient background levels prevailing generally in the area. Based upon the limited testing, arsenic levels are within a narrow range (11 to 16 ppm) and are not apparently elevated compared to ambient background. Lead levels in a broader range (78 to 210 ppm) may be elevated above background but not above the TTLC.

Previous groundwater test results may not be representative of groundwater quality owing to sampling methodology. Groundwater samples collected from unscreened borings are turbid; therefore, test results represent a mixture of groundwater and sediment.

Therefore, there is no current validation of groundwater impairment by heavy metals or petroleum hydrocarbons from any source based upon available test results.

Based upon Earth Metrics test results and previous test results by others, Earth Metrics concludes that the area around the railroad spur contains petroleum hydrocarbons consisting primarily of higher molecular weight hydrocarbons. The petroleum hydrocarbons may be varied in kind (for example, asphalt, tar, oil-based preservative, oil-based weed killer, oil or used diesel fuel, lubricant grease).

Presence of petroleum products is potentially explainable to historic use of the railroad spur. The petroleum hydrocarbons are not explainable as recent unauthorized releases of gasoline or diesel fuel, because the chromatograms do not fit the pattern. The petroleum hydrocarbons are not readily explainable as releases which migrated to the subject site from off-site sources, because they reside in surface soil as shallow as 2.5 to 3 feet. Historic use of the railroad spur by neighborhood industries and spillage during transport is a possible but speculative explanation at this time.

RECOMMENDATIONS

Earth Metrics recommends that groundwater be resampled and tested to verify presence or absence of heavy metals and petroleum hydrocarbons. Petroleum oil and grease around railroad spurs is common and the need for remedial action should not be assumed. Additional testing of potential toxic constituents (such as, for example, benzene, chlorinated pesticides, or PNAs) in soil and in underlying groundwater is recommended by Earth Metrics to enable evaluation of remedial action responses. Impairment to groundwater and toxicity are hypothetical reasons for action alternatives (e.g., excavation and disposal or incineration). On-site biotreatment is viable in the absence of particular toxic constituents that are nonbiodegradable (e.g., lead, DDT). No action is viable in the absence of groundwater impairment and soil toxicity risks. Further toxicity characterization would be necessary to enable assessments of whether or not the affected soil can be left as-is (no action) or remediated. The research presented herein constitutes a sufficient basis for the above conclusion.

This Soil Chemistry Analysis Report was prepared in conformance with accepted standards for such studies and the in-house quality assurance program of Earth Metrics. The undersigned pledge that the facts presented herein are based upon existing conditions at the subject site discovered by Earth Metrics.

Sincerely,

Chris Sanchez
Project Manager

Marc R. Papineau
Manager, Physical Sciences Department
Registered Environmental Assessor 00791

REFERENCES

1. Aqua Terra Technologies, Preliminary (Phase I) Environmental Site Assessment for the Property at 4800 Coliseum Way, Oakland, California, Project No. 9238 (April 8, 1991).

2. Simon Environmental Engineering, Report on Phase II Site Assessment Superior Plaster Castings, 4800 Coliseum Way, Oakland, California, Project no. 513-779.00 (May 16, 1991a).

3. Simon Environmental Engineering, Confirmation of Delineationation Results of Environmental Site Assessment Performed at 4800 Coliseum Avenue, Oakland, California, letter and analytical results (June 17, 1991b).

ATTACHMENT #1

EARTH METRICS MAY 1992 SYNOPSIS
OF PREVIOUS 1991 PHASE I ENVIRONMENTAL SITE ASSESSMENT
OF 4800 COLISEUM WAY, OAKLAND

A Preliminary (Phase I) Environmental Site Assessment for the property at 4800 Coliseum Way, Oakland, identified no specific upgradient releases of hazardous materials that could potentially impair the subject site (Aqua Terra Technologies, Project No. 9238, 1991). The Aqua Terra Technologies Phase I Environmental Site Assessment noted (pp. 5, 6) that proximate historical uses of heavy metals and petroleum products generally present potential impairment risks to the subject site's soil and/or groundwater; therefore, Aqua Terra Technologies recommended (pp. 10, 11) soil and groundwater sampling.

Photo reproductions of Sanborn Fire Insurance Rate Maps cited by Aqua Terra Technologies as Attachments B or C were not included as attachments in the Phase I Environmental Site Assessment reviewed by Earth Metrics.

Narrative discussion by Aqua Terra Technologies listed (p. 6):

- Hancock Oil Company Distribution Plant
- The McGuire and Company Oil Warehouse
- The Independent Construction Asphalt Plant
- The National Lead Company

ATTACHMENT #2

EARTH METRICS MAY 1992 SYNOPSIS
OF PREVIOUS 1991 ANALYTICAL RESULTS
FOR 4800 COLISEUM WAY, OAKLAND

Soil and groundwater chemical analysis was performed by Simon Environmental Engineering in two sampling episodes and two reports submitted to Superior Plaster Castings in May and June 1991 (Simon Environmental Engineering, 1991a, 1991b). Synopses are provided below:

1991a Soil sampled from boring SB-3 at a depth of 3 to 3.5 feet below grade surface was tested to contain 690 ppm petroleum hydrocarbons as diesel. SB-3 is along the railroad spur. other soil samples including SB-4 (along the same spur) did not contain gasoline, diesel, or volatile fuel constituents at reportable levels.

1991a Groundwater apparently sampled from unscreened boring holes was tested to contain no reportable levels of volatile fuel constituents but arsenic, mercury, or lead above the maximum contaminant levels (MCLs) for drinking water. (If sampled from unscreened boring holes, or unfiltered, the groundwater results are considered by Earth Metrics to be nonrepresentative of groundwater quality.)

1991b Fifteen additional soil samples were collected along the railroad spur from depths generally 4.5 to 6 feet below grade surface. Samples SB-11, SB-12, and SB-18 were tested to contain 6,200 ppm, 2,800 ppm, and 2,500 ppm respectively as petroleum oil and grease. Other samples (SB-13, SB-17, SB-19) contained nonreportable levels of petroleum oil and grease (less than 50 ppm).

Gasoline and diesel results are considered by Earth Metrics to be eroneous results. Superior Analytical Laboratories annotated its lab report "not typical gasoline or diesel pattern," referring to the chromatogeans output from the lab's gas chromatograms. Fragments of tar-like substances and "hydrocarbons" were noted by Simon Environmental Engineering in the boring logs.

Groundwater was apparently not sampled or tested in June 1991 as part of the confirmation work.

Simon Environmental Engineering report (Figure 4) total petroleum hydrocarbons in soil results for SB-6, SB-14, and SB-16 were derived by adding gasoline and diesel levels reported by Superior Analytical Laboratories as "not typical of gasoline or diesel patterns." Results for SB-6, SB-14, and SB-16 shown on Figure 4 are not results of EPA 418.1 method, the method used for SB-11, SB-12, SB-13, SB-17, SB-18, and SB-19 and shown on the same Figure 4.

SEQUOIA ANALYTICAL

680 Chesapeake Drive • Redwood City, CA 94063
(415) 364-9600 • FAX (415) 364-9233

Earth Metrics	Client Project ID:	#11293A	Sampled: Apr 2, 1992
7000 Marina Blvd.	Matrix Descript:	Soil	Received: Apr 2, 1992
Brisbane, CA 94005	Analysis Method:	EPA 5030/8015/8020	Analyzed: Apr 7, 1992
Attention: Mark Armstrong	First Sample #:	204-0649	Reported: Apr 16, 1992

TOTAL PETROLEUM FUEL HYDROCARBONS with BTEX DISTINCTION (EPA 8015/8020)

Sample Number	Sample Description	Low/Medium B.P. Hydrocarbons mg/kg (ppm)	Benzene mg/kg (ppm)	Toluene mg/kg (ppm)	Ethyl Benzene mg/kg (ppm)	Xylenes mg/kg (ppm)
204-0649	TS3-2	29	N.D.	N.D.	0.054	0.12
Detection Limits:		**3.0**	**0.015**	**0.015**	**0.015**	**0.015**

Low to Medium Boiling Point Hydrocarbons are quantitated against a gasoline standard.
Analytes reported as N.D. were not present above the stated limit of detection. Because matrix effects and/or other factors required additional sample dilution, detection limits for this sample have been raised.

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Nokowhat D. Herrera
Project Manager

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Earth Metrics	Client Project ID:	#11293A	Sampled:	Apr 2, 1992
7000 Marina Blvd.	Matrix Descript:	Soil	Received:	Apr 2, 1992
Brisbane, CA 94005	Analysis Method:	SM 5520 E&F (Gravimetric)	Extracted:	Apr 7, 1992
Attention: Mark Armstrong	First Sample #:	204-0651	Analyzed:	Apr 8, 1992
			Reported:	Apr 16, 1992

TOTAL RECOVERABLE PETROLEUM OIL

Sample Number	Sample Description	Oil & Grease mg/kg (ppm)
204-0651	TS3-4	29,000

Detection Limits:	30

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

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Nokowhat D. Herrera
Project Manager

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Earth Metrics	Client Project ID:	#11293A	Sampled:	Apr 2, 1992
7000 Marina Blvd.	Sample Descript:	Soil, TS3-1	Received:	Apr 2, 1992
Brisbane, CA 94005			Extracted:	Apr 6, 1992
Attention: Mark Armstrong	Lab Number:	204-0648	Analyzed:	Apr 7, 1992
			Reported:	Apr 16, 1992

LABORATORY ANALYSIS

Analyte	Detection Limit mg/kg	Sample Results mg/kg
Lead	0.25	140
Arsenic	0.50	16

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

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Nokowhat D. Herrera
Project Manager

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Earth Metrics	Client Project ID:	#11293A	Sampled:	Apr 2, 1992
7000 Marina Blvd.	Sample Descript:	Soil, TS3-2	Received:	Apr 2, 1992
Brisbane, CA 94005			Extracted:	Apr 6, 1992
Attention: Mark Armstrong	Lab Number:	204-0649	Analyzed:	Apr 7, 1992
			Reported:	Apr 16, 1992

LABORATORY ANALYSIS

Analyte	Detection Limit mg/kg	Sample Results mg/kg
Lead	0.25	210
Arsenic	0.50	14

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

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Nokowhat D. Herrera
Project Manager

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Earth Metrics	Client Project ID:	#11293A	Sampled:	Apr 2, 1992
7000 Marina Blvd.	Sample Descript:	Soil, TS3-3	Received:	Apr 2, 1992
Brisbane, CA 94005			Extracted:	Apr 6, 1992
Attention: Mark Armstrong	Lab Number:	204-0650	Analyzed:	Apr 7, 1992
			Reported:	Apr 16, 1992

LABORATORY ANALYSIS

Analyte	Detection Limit mg/kg	Sample Results mg/kg
Lead	0.25	78
Arsenic	0.50	11

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

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Nokowhat D. Herrera
Project Manager

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Earth Metrics
7000 Marina Blvd.
Brisbane, CA 94005
Attention: Mark Armstrong

Client Project ID: #11293A

QC Sample Group: 204-0649

Reported: Apr 16, 1992

QUALITY CONTROL DATA REPORT

ANALYTE	Benzene	Toluene	Ethyl-Benzene	Xylenes
Method:	EPA 8020	EPA 8020	EPA 8020	EPA 8020
Analyst:	L.Laikhtman	L.Laikhtman	L.Laikhtman	L.Laikhtman
Reporting Units:	mg/kg	mg/kg	mg/kg	mg/kg
Date Analyzed:	Apr 7, 1992	Apr 7, 1992	Apr 7, 1992	Apr 7, 1992
QC Sample #:	BLK040792	BLK040792	BLK040792	BLK040792
Sample Conc.:	N.D.	N.D.	N.D.	N.D.
Spike Conc. Added:	0.20	0.20	0.20	0.60
Conc. Matrix Spike:	0.21	0.20	0.21	0.60
Matrix Spike % Recovery:	101	100	105	100
Conc. Matrix Spike Dup.:	0.21	0.20	0.21	0.60
Matrix Spike Duplicate % Recovery:	101	100	105	100
Relative % Difference:	0.0	0.0	0.0	0.0

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Nokowhat D. Herrera
Project Manager

% Recovery: $\frac{\text{Conc. of M.S. - Conc. of Sample}}{\text{Spike Conc. Added}} \times 100$

Relative % Difference: $\frac{\text{Conc. of M.S. - Conc. of M.S.D.}}{\text{(Conc. of M.S. + Conc. of M.S.D.) / 2}} \times 100$

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Earth Metrics
7000 Marina Blvd.
Brisbane, CA 94005
Attention: Mark Armstrong

Client Project ID: #11293A

QC Sample Group: 204-0651

Reported: Apr 16, 1992

QUALITY CONTROL DATA REPORT

ANALYTE	Oil & Grease
Method:	SM5220E&F
Analyst:	A.Do
Reporting Units:	mg/kg
Date Analyzed:	Apr 2, 1992
QC Sample #:	BLK040292
Sample Conc.:	N.D.
Spike Conc. Added:	1,000
Conc. Matrix Spike:	870
Matrix Spike % Recovery:	87
Conc. Matrix Spike Dup.:	790
Matrix Spike Duplicate % Recovery:	79
Relative % Difference:	9.6

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Nokowhat D. Herrera
Project Manager

$$\text{\% Recovery:} \quad \frac{\text{Conc. of M.S. - Conc. of Sample}}{\text{Spike Conc. Added}} \times 100$$

$$\text{Relative \% Difference:} \quad \frac{\text{Conc. of M.S. - Conc. of M.S.D.}}{\text{(Conc. of M.S. + Conc. of M.S.D.) / 2}} \times 100$$

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Earth Metrics
7000 Marina Blvd.
Brisbane, CA 94005
Attention: Mark Armstrong

Client Project ID: #11293A

QC Sample Group: 2040648 - 50

Reported: Apr 16, 1992

QUALITY CONTROL DATA REPORT

ANALYTE	Lead	Arsenic
Method:	EPA 7421	EPA 6010
Analyst:	S.Chin	C.Medefesser
Reporting Units:	mg/kg	mg/kg
Date Analyzed:	Apr 7, 1992	Apr 7, 1992
QC Sample #:	204-0620	204-0650
Sample Conc.:	91	11
Spike Conc. Added:	250	100
Conc. Matrix Spike:	340	110
Matrix Spike % Recovery:	100	99
Conc. Matrix Spike Dup.:	330	110
Matrix Spike Duplicate % Recovery:	96	99
Relative % Difference:	3.0	0.0

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Nokowhat D. Herrera
Project Manager

% Recovery: $\frac{\text{Conc. of M.S. - Conc. of Sample}}{\text{Spike Conc. Added}} \times 100$

Relative % Difference: $\frac{\text{Conc. of M.S. - Conc. of M.S.D.}}{\text{(Conc. of M.S. + Conc. of M.S.D.) / 2}} \times 100$

CHAIN OF CUSTODY RECORD

COPY

PROJ. NO.	SITE NAME AND ADDRESS
11793 A	Superior Plaster 4800 Coliseum Avenue Oakland CA

SAMPLERS: SIGNATURE

STA.NO. (LABEL)	DATE	TIME	COMP.	GRAB	STATION LOCATION (NARRATIVE DESCRIPTION)	TYPE/ NUMBER CON-TAINERS	Lead Analysis	Arsenic Analysis	Total Oil and Grease 520	BTEX				REMARKS
TS3-1	4/2/92	12.00		X	30' From North line 18' From Bldg	50-1/ Brass	X	X						2040648
TS3-2	4/2/92	12:45		X	30' From South line 18' From Bldg	50-1/ Brass Sleeve	X	X	X	X				49
TS3-3	4/2/92	1:15		X	52' From South line 18' From Bldg	50-1/ Brass Sleeve	X	X						50
TS3-4	4/2/92	1:45		X	12' From North line 18' From Bldg	50 V Brass Sleeve			X					51

Relinquished by: Signature	Date/Time	Received by: Signature	Date/Time
	4-2-92 2:40pm		
Relinquished by: Signature	Date/Time	Received by: Signature	Date/Time
Relinquished by: Signature	Date/Time	Received by: Signature	Date/Time
			4/2/92 2:40pm

REMARKS: STD TAT

Provide QA/QC Report & Calibration

EARTH METRICS INCORPORATED
7000 Marina Blvd., 4th Floor
Brisbane, California 94005
Tel (415) 742-9900 Fax (415) 742-1033