SOIL CHARACTERIZATION
Building 42
Westinghouse Emeryville Facility

Prepared for

Westinghouse Electric Corporation

September 1993

Prepared by

EMCON Associates
1921 Ringwood Avenue
San Jose, California 95131-1721

Project 0F88-001.15

EMCON Associates
1921 Ringwood Avenue • San Jose, California 95131-1721 • **(408) 453-7300** • Fax (408) 437-9526

October 27, 1993
Project 0F88-001.15

Mr. Gordon Taylor
Senior Project Engineer
Westinghouse Electric Corporation
Gateway Center
Pittsburgh, Pennsylvania 15222

Re: Soil sampling and analysis, building 42, Emeryville facility

Dear Mr. Taylor:

EMCON Associates (EMCON) is pleased to submit this soil characterization report for a soils investigation beneath the building 42 slab at the Westinghouse Electric Corporation facility in Emeryville, California.

The investigation showed that polychlorinated biphenyls were detected in 8 of 16 soil samples collected under building 42. Total petroleum hydrocarbons as diesel or hydraulic oil above 100 parts per million were detected in only 2 of the 16 samples. Volatile organic compounds (chlorobenzene and dichlorobenzenes) were detected in three of the 16 samples. No benzene, toluene, ethylbenzene, and xylene compounds were detected in any of the 16 soil samples.

If you have questions, please call.

Sincerely,

EMCON Associates

Mark Smolley

Mark Smolley
Project Manager

Attachment: Soil Characterization Report

ESJPJ0F\0F880011.5BZ-93 clf:5

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TABLES AND ILLUSTRATIONS

Tables

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1 INTRODUCTION

This report discusses the results of a soil sampling event conducted by EMCON Associates (EMCON) at the Westinghouse Electric Corporation (Westinghouse) facility at 5840 Landregen Street, Emeryville, California (the Facility) (Figure 1). Soil samples were collected at 8 locations beneath building 42 according to the investigation approach described in the *Sampling and Analysis Plan* (EMCON, September 8, 1993).

1.1 Background

Westinghouse formerly operated an apparatus service plant at the Facility. In the early days of its operation, some transformers and other electrical apparatus were manufactured at the Facility. Facility operations historically included regional and district administration, engineering services, warehousing, and repair of transformers and other electrical apparatus. Westinghouse ceased using the Facility for on-site repair of electrical apparatus in 1982 and ceased using the Facility entirely in 1992.

Some of the manufacture, repair, and service activities at the Facility involved handling, storing, and using dielectric fluids, some of which contained polychlorinated biphenyls (PCBs). In addition, previous environmental investigations identified the presence of volatile organic compounds (VOCs) and petroleum hydrocarbons (gasoline and diesel).

1.2 Objective

The primary objective of the soil sampling was to determine whether the soils beneath building 42 may have been impacted by chemicals used during the manufacturing and repair operations at the site. The soil samples were analyzed for PCBs; halogenated VOCs; high-boiling-point hydrocarbons (HBHCs), which include total petroleum hydrocarbons (TPH) as diesel and hydraulic oil; TPH as gasoline; and benzene, toluene, ethylbenzene, and xylenes (BTEX).

A previous soil investigation was conducted in buildings 24 and 37 in June 1993. Forty-five soil samples were collected from twenty-three locations. The samples were analyzed for the same constituents listed above for building 42. The results are reported in the *Soil Characterization Report* (EMCON, August 30, 1993).

2 SITE CHARACTERIZATION

This section describes the rationale for soil sampling, the methods and procedures used during drilling and sampling activities, and the analytical methods used to test the soil samples. This section also presents the observations made during the field investigation.

2.1 Soil Sampling Rationale

Two samples were collected and analyzed at each boring location to evaluate the vertical extent of any impact on the unsaturated soils. Eight soil borings (SB-25 through SB-32) were drilled and sampled beneath the concrete floor of building 42. Two samples were collected from each boring at depths of 1.5 to 2.0 feet and 3.5 feet to 4.0 feet, as measured from the base of the concrete pad.

2.2 Soil Boring Procedures

Before drilling began, a concrete cutting service was contracted to core the concrete at each boring location. The borings were drilled using hand-augers and samples were collected using push-drive samplers. The hand-auger and push-drive samples were steam-cleaned or washed with phosphate-free detergent and rinsed before each use.

The augers were used to drill down to the top of the first sampling zone then removed from the boring. The push-drive sampler, fitted with a stainless-steel ring, was inserted into the boring and a sample collected by driving the sampler into the undisturbed soil (from 1.5 to 2.0 feet). After the sampler was removed from the boring, the ring was removed and its ends covered with Teflon® tape and plastic end-caps. The sample was then labeled, placed inside a plastic zip-lock bag, and stored in a cooler containing ice. Hand-augering was continued down to the top of the second sampling zone (3.5 feet) and a second sample was collected (from 3.5 to 4.0 feet).

The samples were delivered to Columbia Analytical Services (CAS), a state-certified laboratory, along with appropriate chain-of-custody forms to document possession and transfer of samples.

2.3 Analytical Methods - Soil Samples

All the samples were analyzed for PCBs (by U.S. Environmental Protection Agency [EPA] method 8080), VOCs (by EPA method 8010), HBHCs (including TPH as diesel and hydraulic oil) and TPH as gasoline (by the Leaking Underground Fuel Tank [LUFT] method), and BTEX (by EPA method 8020). The certified analytical reports are presented in Appendix A.

2.4 Field Observations

The field investigation generally indicates that the Westinghouse Emeryville site lies upon a fill layer between 1 and 4 feet thick, consisting of silty gravel. This fill layer overlies Bay Mud deposits, which consist of silt, clay, and clayey sand. Groundwater was not encountered in any of the eight borings drilled in building 42.

3 ANALYTICAL RESULTS

This section discusses the analytical results for the soil samples collected. Table 1 summarizes all the analytical results. Figure 2 presents the PCB concentrations, Figure 3 the TPH concentrations, and Figure 4 the VOC concentrations for each sample collected. Table 1 and Figures 2, 3, and 4 also present the results from borings SB-1 through SB-24, which were collected beneath buildings 24 and 37. These results are discussed in the soil characterization report (EMCON, August 30, 1993) The certified analytical reports for the most recent investigation are presented in Appendix A, and the laboratory quality control results are evaluated in Appendix B.

Figures 2, 3, and 4 also present analyses from borings EB-1 and EB-2, which were drilled in January 1992 as part of a geotechnical engineering evaluation. These results were reported in *Geotechnical and Environmental Assessment for New Wall Construction* (Hart Crowser, Inc., February 27, 1993).

3.1 PCBs

Beneath the building 42 slab, eight samples had detectable concentrations of PCBs. Seven soil samples contained PCBs between 0.1 and 2.2 parts per million (ppm). Sample SB-26 at 3.5 feet contained 46 ppm PCBs. All other samples (8 total) did not contain PCBs above the analytical method reporting limit of 0.1 ppm.

3.2 Petroleum Hydrocarbons

Although TPH as hydraulic oil or diesel were detected in 7 of the 16 soil samples, concentrations in only 2 samples exceeded 100 ppm. Sample SB-26 at 3.5 feet contained 1,100 ppm TPH as hydraulic oil and sample SB-27 at 1.5 feet contained 4,100 ppm TPH as hydraulic oil. The remaining 5 samples that contained TPH as hydraulic oil had concentrations between 29 and 84 ppm.

3.3 VOCs

VOCs were detected in 3 of the 16 samples. Samples SB-26 at 3.5 feet, and SB-29 at 1.5 and at 3.5 feet contained chlorobenzene at concentrations between 0.61 and 1.8 ppm. Sample SB-26 at 3.5 feet also contained dichlorobenzenes (DCB) (1,2-DCB, 1,3-DCB, and 1,4-DCB) at concentrations between 0.4 and 15 ppm.

3.4 TPH as Gasoline and BTEX

TPH as gasoline was detected in one sample, SB-26 at 3.5 feet, at 36 ppm. No TPH as gasoline or BTEX were detected in any of the other 15 samples collected beneath the building 42 slab.

3.5 Summary of Soil Analyses

PCBs were detected in 8 of the 16 soil samples collected under building 42, with the highest concentration being 46 ppm. The other samples that contained PCBs were all less than 3 ppm.

The highest TPH concentration (as hydraulic oil) was 4,100 ppm in SB-27 at 1.5 feet. One other sample contained TPH (as hydraulic oil) above 100 ppm. Five soil samples contained TPH between 29 and 84 ppm.

VOCs (chlorobenzene or dichlorobenzenes) were detected in three of the samples, and TPH as gasoline was detected in one sample. No TPH as gasoline, or BTEX were detected in any of the remaining 15 soil samples.

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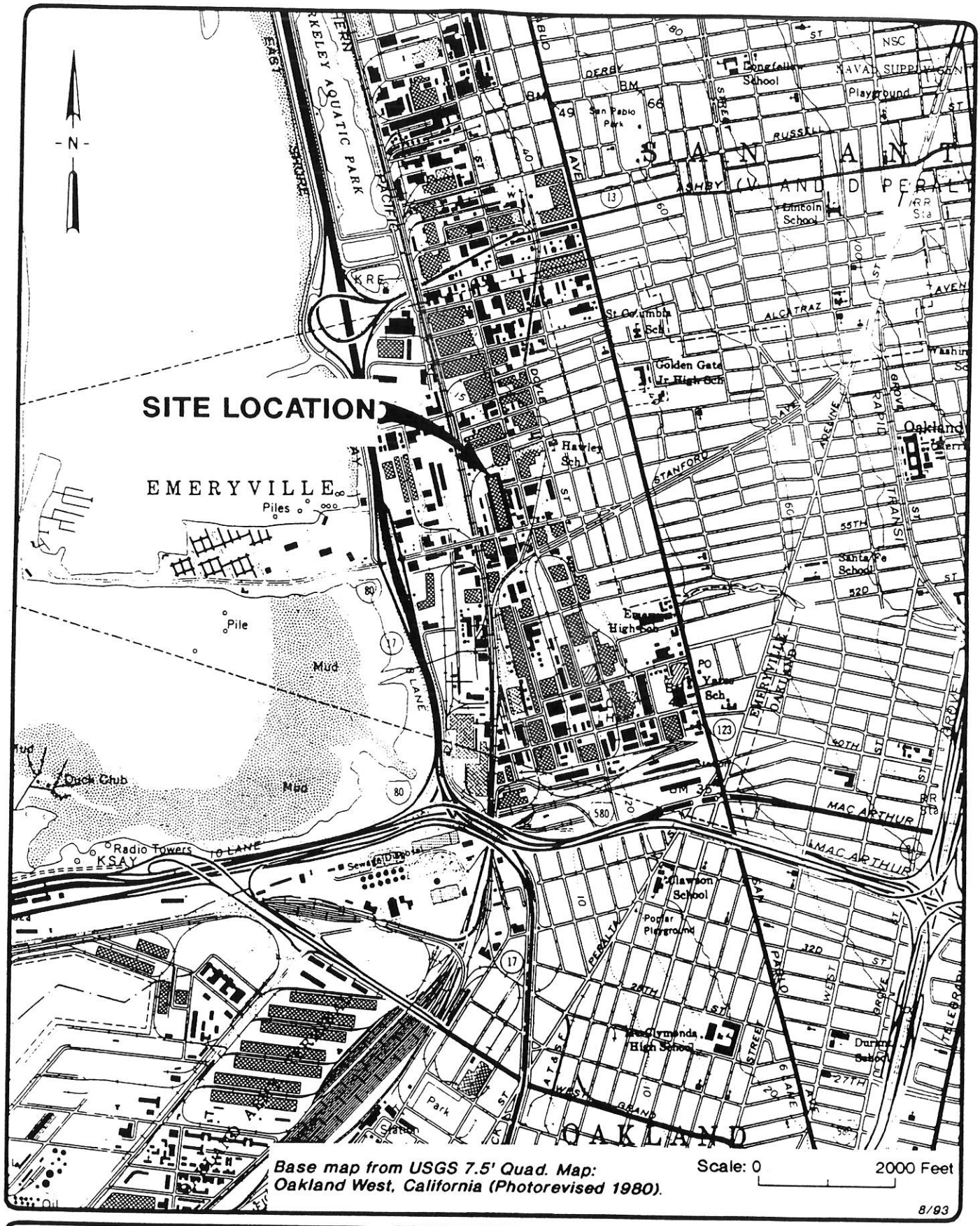


Base map from USGS 7.5' Quad. Map: Oakland West, California (Photorevised 1980).

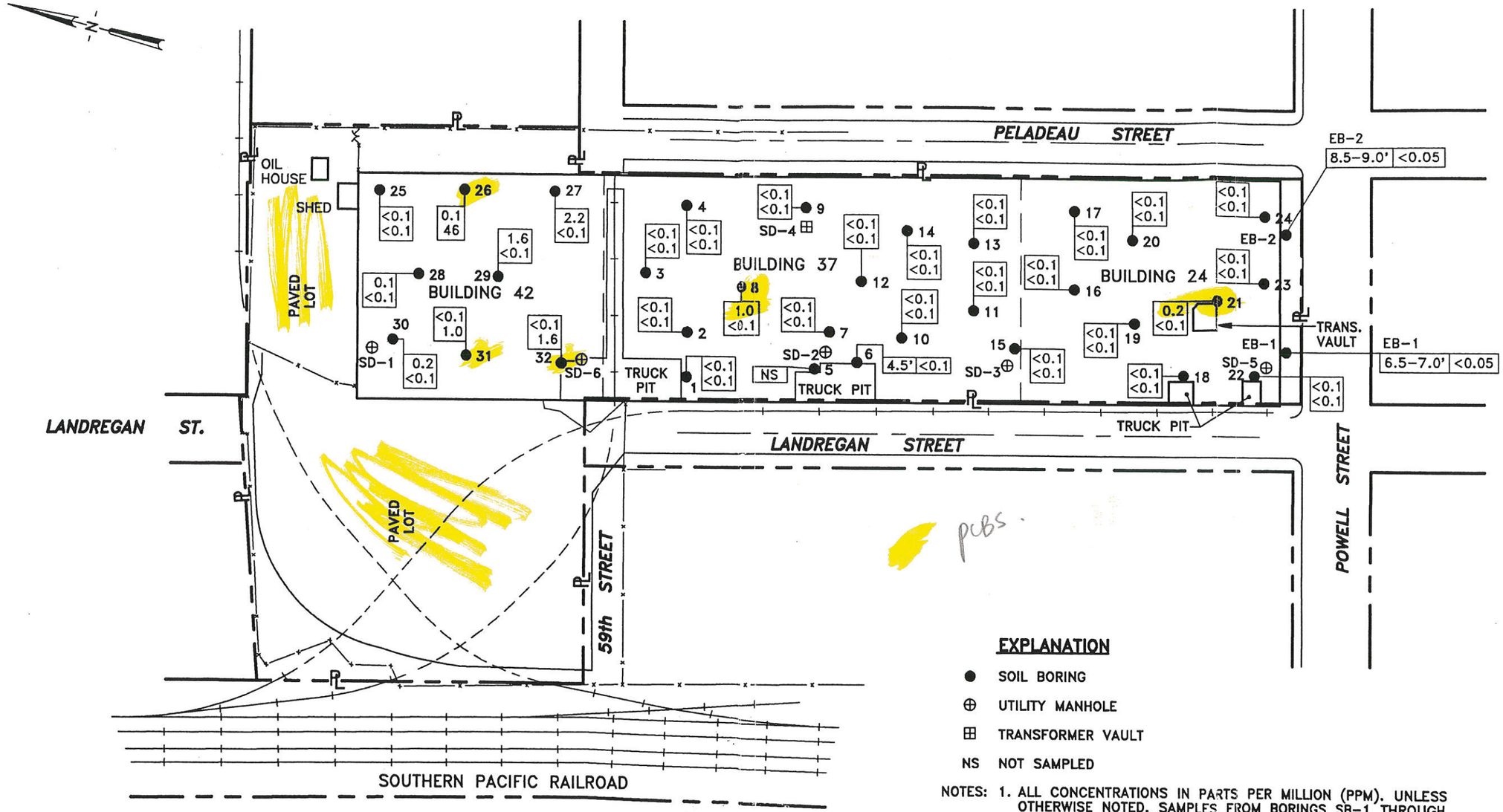
8/93

EMCON Associates

WESTINGHOUSE ELECTRIC CORPORATION
SOIL SAMPLING
EMERYVILLE, CALIFORNIA

SITE LOCATION

FIGURE
1
PROJECT NO.
F88-01.14



EXPLANATION

- ● SOIL BORING
- ⊕ UTILITY MANHOLE
- ⊞ TRANSFORMER VAULT
- NS NOT SAMPLED

NOTES:
1. ALL CONCENTRATIONS IN PARTS PER MILLION (PPM). UNLESS OTHERWISE NOTED, SAMPLES FROM BORINGS SB-1 THROUGH SB-24 WERE COLLECTED AT DEPTHS OF 1.5 AND 3 FEET. SAMPLES FROM BORINGS SB-25 THROUGH SB-32 WERE COLLECTED AT DEPTHS OF 1.5 AND 3.5 FEET.
2. BORINGS EB-1 AND EB-2 WERE COMPLETED AS PART OF A GEOTECHNICAL INVESTIGATION IN JANUARY 1992.

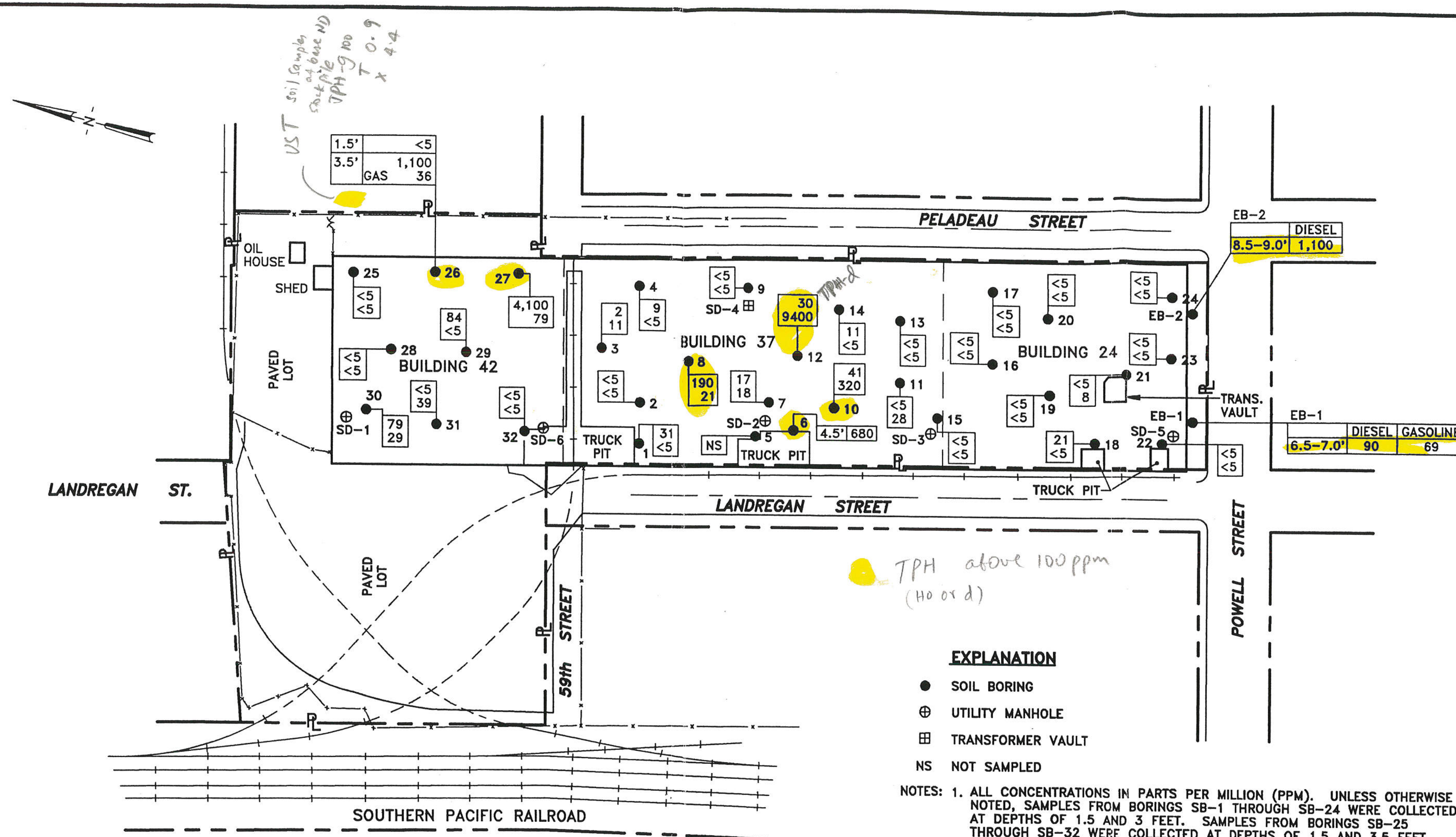
EMCON Associates

SCALE: 0 100 200 FEET

WESTINGHOUSE ELECTRIC CORPORATION
SOIL SAMPLING
EMERYVILLE, CALIFORNIA

POLYCHLORINATED BIPHENYLS (PCBs) CONCENTRATIONS

FIGURE NO. 2
PROJECT NO. F88-01.15



EXPLANATION

- ● SOIL BORING
- ⊕ UTILITY MANHOLE
- ⊞ TRANSFORMER VAULT
- NS NOT SAMPLED

NOTES:
1. ALL CONCENTRATIONS IN PARTS PER MILLION (PPM). UNLESS OTHERWISE NOTED, SAMPLES FROM BORINGS SB-1 THROUGH SB-24 WERE COLLECTED AT DEPTHS OF 1.5 AND 3 FEET. SAMPLES FROM BORINGS SB-25 THROUGH SB-32 WERE COLLECTED AT DEPTHS OF 1.5 AND 3.5 FEET. FOR BORING SB-1 THROUGH SB-32, ALL CONCENTRATIONS ARE FOR TOTAL PETROLEUM HYDROCARBON AS HYDRAULIC OIL, EXCEPT FOR BORINGS SB-3 AT 1.5 FEET AND SB-12 AT 3 FEET WHICH CONTAINED TPH AS DIESEL AND SB-26 AT 3.5 FEET WHICH ALSO CONTAINED GASOLINE.
2. BORINGS EB-1 AND EB-2 WERE COMPLETED AS PART OF A GEOTECHNICAL INVESTIGATION IN JANUARY 1992.

EMCON Associates

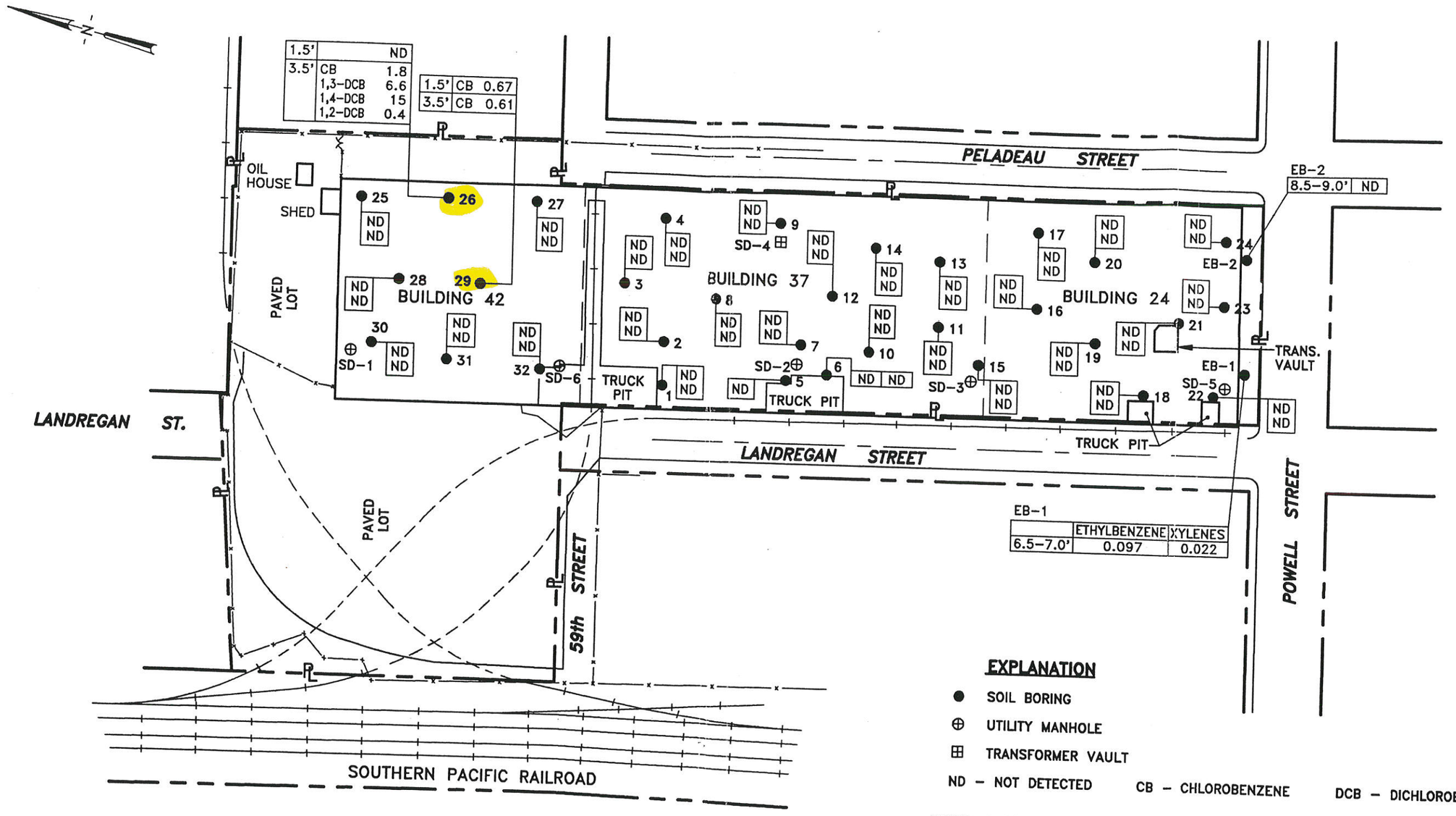
SCALE: 0 100 200 FEET

WESTINGHOUSE ELECTRIC CORPORATION
SOIL SAMPLING
EMERYVILLE, CALIFORNIA

TOTAL PETROLEUM HYDROCARBON CONCENTRATIONS

FIGURE NO. 3

PROJECT NO. F88-01.15



EXPLANATION

- ● SOIL BORING
- ⊕ UTILITY MANHOLE
- ⊞ TRANSFORMER VAULT

ND – NOT DETECTED CB – CHLOROBENZENE DCB – DICHLOROBENZENE

NOTES: 1. ALL CONCENTRATIONS IN PARTS PER MILLION (PPM). UNLESS OTHERWISE NOTED, SAMPLES FROM BORINGS SB-1 THROUGH SB-24 WERE COLLECTED AT DEPTHS OF 1.5 AND 3 FEET. SAMPLES FROM BORINGS SB-25 THROUGH SB-32 WERE COLLECTED AT DEPTHS OF 1.5 AND 3.5 FEET.

2. BORINGS EB-1 AND EB-2 WERE COMPLETED AS PART OF A GEOTECHNICAL INVESTIGATION IN JANUARY 1992.

EMCON Associates

SCALE: 0 100 200 FEET

WESTINGHOUSE ELECTRIC CORPORATION
SOIL SAMPLING
EMERYVILLE, CALIFORNIA

VOLATILE ORGANIC COMPOUNDS CONCENTRATIONS

FIGURE NO. 4

PROJECT NO. F88-01.15

APPENDIX A

CERTIFIED ANALYTICAL REPORTS AND CHAIN-OF-CUSTODY DOCUMENTATION

Columbia Analytical Services INC.

September 20, 1993

Service Request No: SJ93-1133

Vivian Hsiong
EMCON Associates
1921 Ringwood Avenue
San Jose, CA 95131

Re: **Westinghouse Emeryville/0F88-001.15**

Dear Ms. Hsiong:

Attached are the results of the soil samples submitted to our lab on September 13, 1993. For your reference, these analyses have been assigned our service request number SJ93-1133.

All analyses were performed consistent with our laboratory's quality assurance program. All results are intended to be considered in their entirety, and CAS is not responsible for use of less than the complete report. Results apply only to the samples analyzed.

Please call if you have any questions.

Respectfully submitted:

Keoni A. Murphy
COLUMBIA ANALYTICAL SERVICES, INC.

KAM/kmh

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Acronyms

ASTM	American Society for Testing and Materials
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
LUFT	Leaking Underground Fuel Tank
MCL	Maximum Contaminant Level is the highest permissible concentration of a substance allowed in drinking water as established by the USEPA.
MDL	Method Detection Limit
MRL	Method Reporting Limit
NA	Not Applicable
NAN	Not Analyzed
NC	Not Calculated
NCASI	National Council of the Paper Industry for Air and Stream Improvement
ND	Not Detected at or above the MRL
NR	Not Requested
NIOSH	National Institute for Occupational Safety and Health
PQL	Practical Quantitation Limit
RCRA	Resource Conservation and Recovery Act
SIM	Selected Ion Monitoring
TPH	Total Petroleum Hydrocarbons
VPH	Volatile Petroleum Hydrocarbons

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	EMCON Associates	**Date Received:**	09/13/93
Project:	Westinghouse Emeryville/0F88-001.15	**Date Extracted:**	09/14/93
Sample Matrix:	Soil	**Service Request No.:**	SJ93-1133

Hydrocarbon Scan
EPA Methods 3550/California DHS LUFT Method
mg/Kg (ppm)
As Received Basis

Sample Name	Date Analyzed	Mineral Spirits	Jet Fuel	Kerosene	Diesel	Hydraulic Oil
SB-25-1.5	09/14/93	ND	ND	ND	ND	ND
SB-25-3.5	09/14/93	ND	ND	ND	ND	ND
SB-26-1.5	09/14/93	ND	ND	ND	ND	ND
SB-26-3.5	09/14/93 *	ND	ND	ND	ND	1,100.
SB-27-1.5	09/14/93 *	ND	ND	ND	ND	4,100.
SB-27-3.5	09/14/93 *	ND	ND	ND	ND	79.
SB-28-1.5	09/14/93	ND	ND	ND	ND	ND
SB-28-3.5	09/14/93	ND	ND	ND	ND	ND
SB-29-1.5	09/14/93 *	ND	ND	ND	ND	84.
SB-29-3.5	09/14/93	ND	ND	ND	ND	ND
SB-30-1.5	09/14/93 *	ND	ND	ND	ND	79.
SB-30-3.5	09/14/93 *	ND	ND	ND	ND	29.
SB-31-1.5	09/14/93 *	ND	ND	ND	ND	ND
SB-31-3.5	09/14/93 *	ND	ND	ND	ND	39.
SB-32-1.5	09/14/93 *	ND	ND	ND	ND	ND
SB-32-3.5	09/14/93 *	ND	ND	ND	ND	ND
Method Blank	09/14/93	ND	ND	ND	ND	ND
MRL		1	1	1	1	5

* This sample was part of the analytical batch started on September 14, 1993. However, it was analyzed after midnight so the actual date analyzed is September 15, 1993.

Approved by: Kevin Murphy Date: September 20, 1993

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	EMCON Associates	**Date Received:**	09/13/93
Project:	Westinghouse Emeryville/0F88-001.15	**Service Request No.:**	SJ93-1133
Sample Matrix:	Soil		

BTEX and TPH as Gasoline
EPA Methods 5030/8020/California DHS LUFT Method
mg/Kg (ppm)
As Received Basis

Sample Name:		SB-25-1.5	SB-25-3.5	SB-26-1.5
Date Analyzed:		09/14/93	09/16/93	09/14/93
Analyte	**MRL**			
Benzene	0.05	ND	ND	ND
Toluene	0.1	ND	ND	ND
Ethylbenzene	0.1	ND	ND	ND
Total Xylenes	0.1	ND	ND	ND
TPH as Gasoline	5	ND	ND	ND

Sample Name:		SB-26-3.5	SB-27-1.5	SB-27-3.5
Date Analyzed:		09/14/93 *	09/14/93 *	09/14/93
Analyte	**MRL**			
Benzene	0.05	ND	ND	ND
Toluene	0.1	ND	ND	ND
Ethylbenzene	0.1	<0.2 **	ND	ND
Total Xylenes	0.1	ND	ND	ND
TPH as Gasoline	5	36. ***	ND	ND

* This sample was part of the analytical batch started on September 14, 1993. However, it was analyzed after midnight so the actual date analyzed is September 15, 1993.

** Raised MRL due to matrix interference.

*** The sample contains components eluting in the gasoline range that were quantitated as gasoline. The chromatogram does not match the typical gasoline fingerprint.

Approved by: Keem A Murphy Date: September 20, 1993

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: EMCON Associates
Project: Westinghouse Emeryville/0F88-001.15
Sample Matrix: Soil

Date Received: 09/13/93
Service Request No.: SJ93-1133

BTEX and TPH as Gasoline
EPA Methods 5030/8020/California DHS LUFT Method
mg/Kg (ppm)
As Received Basis

Sample Name:		SB-28-1.5	SB-28-3.5	SB-29-1.5
Date Analyzed:		09/14/93	09/14/93	09/14/93
Analyte	**MRL**			
Benzene	0.05	ND	ND	ND
Toluene	0.1	ND	ND	ND
Ethylbenzene	0.1	ND	ND	ND
Total Xylenes	0.1	ND	ND	ND
TPH as Gasoline	5	ND	ND	ND

Sample Name:		SB-29-3.5	SB-30-1.5	SB-30-3.5
Date Analyzed:		09/16/93	09/14/93	09/14/93
Analyte	**MRL**			
Benzene	0.05	ND	ND	ND
Toluene	0.1	ND	ND	ND
Ethylbenzene	0.1	ND	ND	ND
Total Xylenes	0.1	ND	ND	ND
TPH as Gasoline	5	ND	ND	ND

* This sample was part of the analytical batch started on September 14, 1993. However, it was analyzed after midnight so the actual date analyzed is September 15, 1993.

Approved by: Kevin A Murphy Date: September 20, 1993

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	EMCON Associates		
Project:	Westinghouse Emeryville/0F88-001.15	**Date Received:**	09/13/93
Sample Matrix:	Soil	**Service Request No.:**	SJ93-1133

BTEX and TPH as Gasoline
EPA Methods 5030/8020/California DHS LUFT Method
mg/Kg (ppm)
As Received Basis

Sample Name:		SB-31-1.5	SB-31-3.5	SB-32-1.5
Date Analyzed:		09/14/93 *	09/14/93 *	09/14/93 *
Analyte	**MRL**			
Benzene	0.05	ND	ND	ND
Toluene	0.1	ND	ND	ND
Ethylbenzene	0.1	ND	ND	ND
Total Xylenes	0.1	ND	ND	ND
TPH as Gasoline	5	ND	ND	ND

Sample Name:		SB-32-3.5	Method Blank	Method Blank
Date Analyzed:		09/14/93 *	09/14/93	09/16/93
Analyte	**MRL**			
Benzene	0.05	ND	ND	ND
Toluene	0.1	ND	ND	ND
Ethylbenzene	0.1	ND	ND	ND
Total Xylenes	0.1	ND	ND	ND
TPH as Gasoline	5	ND	ND	ND

* This sample was part of the analytical batch started on September 14, 1993. However, it was analyzed after midnight so the actual date analyzed is September 15, 1993.

Approved by: Kevin Murphy Date: September 20, 1993

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: EMCON Associates
Project: Westinghouse Emeryville/0F88-001.15
Sample Matrix: Soil

Date Received: 09/13/93
Service Request No.: SJ93-1133

Halogenated Volatile Organic Compounds
EPA Methods 5030/8010
mg/Kg (ppm)
As Received Basis

Sample Name:		SB-25-1.5	SB-25-3.5	SB-26-1.5
Date Analyzed:		09/14/93	09/14/93	09/14/93
Analyte	**MRL**			
Dichlorodifluoromethane (Freon 12)	0.1	ND	ND	ND
Chloromethane	0.1	ND	ND	ND
Vinyl Chloride	0.05	ND	ND	ND
Bromomethane	0.05	ND	ND	ND
Chloroethane	0.05	ND	ND	ND
Trichlorofluoromethane (Freon 11)	0.05	ND	ND	ND
1,1-Dichloroethene	0.05	ND	ND	ND
Trichlorotrifluoroethane (Freon 113)	0.05	ND	ND	ND
Methylene Chloride	0.05	ND	ND	ND
trans-1,2-Dichloroethene	0.05	ND	ND	ND
cis-1,2-Dichloroethene	0.05	ND	ND	ND
1,1-Dichloroethane	0.05	ND	ND	ND
Chloroform	0.05	ND	ND	ND
1,1,1-Trichloroethane (TCA)	0.05	ND	ND	ND
Carbon Tetrachloride	0.05	ND	ND	ND
1,2-Dichloroethane	0.05	ND	ND	ND
Trichloroethene (TCE)	0.05	ND	ND	ND
1,2-Dichloropropane	0.05	ND	ND	ND
Bromodichloromethane	0.05	ND	ND	ND
2-Chloroethyl Vinyl Ether	0.5	ND	ND	ND
trans-1,3-Dichloropropene	0.05	ND	ND	ND
cis-1,3-Dichloropropene	0.05	ND	ND	ND
1,1,2-Trichloroethane	0.05	ND	ND	ND
Tetrachloroethene (PCE)	0.05	ND	ND	ND
Dibromochloromethane	0.05	ND	ND	ND
Chlorobenzene	0.05	ND	ND	ND
Bromoform	0.05	ND	ND	ND
1,1,2,2-Tetrachloroethane	0.05	ND	ND	ND
1,3-Dichlorobenzene	0.1	ND	ND	ND
1,4-Dichlorobenzene	0.1	ND	ND	ND
1,2-Dichlorobenzene	0.1	ND	ND	ND

Approved by: Kevin P. Murphy Date: September 20, 1993

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: EMCON Associates
Project: Westinghouse Emeryville/0F88-001.15
Sample Matrix: Soil

Date Received: 09/13/93
Service Request No.: SJ93-1133

Halogenated Volatile Organic Compounds
EPA Methods 5030/8010
mg/Kg (ppm)
As Received Basis

Sample Name:		SB-26-3.5	SB-27-1.5	SB-27-3.5
Date Analyzed:		09/14/93	09/14/93	09/14/93
Analyte	**MRL**			
Dichlorodifluoromethane (Freon 12)	0.1	ND	ND	ND
Chloromethane	0.1	ND	ND	ND
Vinyl Chloride	0.05	ND	ND	ND
Bromomethane	0.05	ND	ND	ND
Chloroethane	0.05	ND	ND	ND
Trichlorofluoromethane (Freon 11)	0.05	ND	ND	ND
1,1-Dichloroethene	0.05	ND	ND	ND
Trichlorotrifluoroethane (Freon 113)	0.05	ND	ND	ND
Methylene Chloride	0.05	ND	ND	ND
trans-1,2-Dichloroethene	0.05	ND	ND	ND
cis-1,2-Dichloroethene	0.05	ND	ND	ND
1,1-Dichloroethane	0.05	ND	ND	ND
Chloroform	0.05	ND	ND	ND
1,1,1-Trichloroethane (TCA)	0.05	ND	ND	ND
Carbon Tetrachloride	0.05	ND	ND	ND
1,2-Dichloroethane	0.05	ND	ND	ND
Trichloroethene (TCE)	0.05	ND	ND	ND
1,2-Dichloropropane	0.05	ND	ND	ND
Bromodichloromethane	0.05	ND	ND	ND
2-Chloroethyl Vinyl Ether	0.5	ND	ND	ND
trans-1,3-Dichloropropene	0.05	ND	ND	ND
cis-1,3-Dichloropropene	0.05	ND	ND	ND
1,1,2-Trichloroethane	0.05	ND	ND	ND
Tetrachloroethene (PCE)	0.05	ND	ND	ND
Dibromochloromethane	0.05	ND	ND	ND
Chlorobenzene	0.05	1.8	ND	ND
Bromoform	0.05	ND	ND	ND
1,1,2,2-Tetrachloroethane	0.05	ND	ND	ND
1,3-Dichlorobenzene	0.1	6.6	ND	ND
1,4-Dichlorobenzene	0.1	15.	ND	ND
1,2-Dichlorobenzene	0.1	0.4	ND	ND

Approved by: Kevin Murphy Date: September 20, 1993

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: EMCON Associates
Project: Westinghouse Emeryville/0F88-001.15
Sample Matrix: Soil

Date Received: 09/13/93
Service Request No.: SJ93-1133

Halogenated Volatile Organic Compounds
EPA Methods 5030/8010
mg/Kg (ppm)
As Received Basis

Sample Name:		SB-28-1.5	SB-28-3.5	SB-29-1.5
Date Analyzed:		09/14/93	09/14/93	09/14/93
Analyte	**MRL**			
Dichlorodifluoromethane (Freon 12)	0.1	ND	ND	ND
Chloromethane	0.1	ND	ND	ND
Vinyl Chloride	0.05	ND	ND	ND
Bromomethane	0.05	ND	ND	ND
Chloroethane	0.05	ND	ND	ND
Trichlorofluoromethane (Freon 11)	0.05	ND	ND	ND
1,1-Dichloroethene	0.05	ND	ND	ND
Trichlorotrifluoroethane (Freon 113)	0.05	ND	ND	ND
Methylene Chloride	0.05	ND	ND	ND
trans-1,2-Dichloroethene	0.05	ND	ND	ND
cis-1,2-Dichloroethene	0.05	ND	ND	ND
1,1-Dichloroethane	0.05	ND	ND	ND
Chloroform	0.05	ND	ND	ND
1,1,1-Trichloroethane (TCA)	0.05	ND	ND	ND
Carbon Tetrachloride	0.05	ND	ND	ND
1,2-Dichloroethane	0.05	ND	ND	ND
Trichloroethene (TCE)	0.05	ND	ND	ND
1,2-Dichloropropane	0.05	ND	ND	ND
Bromodichloromethane	0.05	ND	ND	ND
2-Chloroethyl Vinyl Ether	0.5	ND	ND	ND
trans-1,3-Dichloropropene	0.05	ND	ND	ND
cis-1,3-Dichloropropene	0.05	ND	ND	ND
1,1,2-Trichloroethane	0.05	ND	ND	ND
Tetrachloroethene (PCE)	0.05	ND	ND	ND
Dibromochloromethane	0.05	ND	ND	ND
Chlorobenzene	0.05	ND	ND	0.67
Bromoform	0.05	ND	ND	ND
1,1,2,2-Tetrachloroethane	0.05	ND	ND	ND
1,3-Dichlorobenzene	0.1	ND	ND	ND
1,4-Dichlorobenzene	0.1	ND	ND	ND
1,2-Dichlorobenzene	0.1	ND	ND	ND

Approved by: Kevin Murphy Date: September 20, 1993

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	EMCON Associates		
Project:	Westinghouse Emeryville/0F88-001.15	**Date Received:**	09/13/93
Sample Matrix:	Soil	**Service Request No.:**	SJ93-1133

Halogenated Volatile Organic Compounds
EPA Methods 5030/8010
mg/Kg (ppm)
As Received Basis

Sample Name:		SB-29-3.5	SB-30-1.5	SB-30-3.5
Date Analyzed:		09/15/93	09/14/93	09/15/93
Analyte	**MRL**			
Dichlorodifluoromethane (Freon 12)	0.1	ND	ND	ND
Chloromethane	0.1	ND	ND	ND
Vinyl Chloride	0.05	ND	ND	ND
Bromomethane	0.05	ND	ND	ND
Chloroethane	0.05	ND	ND	ND
Trichlorofluoromethane (Freon 11)	0.05	ND	ND	ND
1,1-Dichloroethene	0.05	ND	ND	ND
Trichlorotrifluoroethane (Freon 113)	0.05	ND	ND	ND
Methylene Chloride	0.05	ND	ND	ND
trans-1,2-Dichloroethene	0.05	ND	ND	ND
cis-1,2-Dichloroethene	0.05	ND	ND	ND
1,1-Dichloroethane	0.05	ND	ND	ND
Chloroform	0.05	ND	ND	ND
1,1,1-Trichloroethane (TCA)	0.05	ND	ND	ND
Carbon Tetrachloride	0.05	ND	ND	ND
1,2-Dichloroethane	0.05	ND	ND	ND
Trichloroethene (TCE)	0.05	ND	ND	ND
1,2-Dichloropropane	0.05	ND	ND	ND
Bromodichloromethane	0.05	ND	ND	ND
2-Chloroethyl Vinyl Ether	0.5	ND	ND	ND
trans-1,3-Dichloropropene	0.05	ND	ND	ND
cis-1,3-Dichloropropene	0.05	ND	ND	ND
1,1,2-Trichloroethane	0.05	ND	ND	ND
Tetrachloroethene (PCE)	0.05	ND	ND	ND
Dibromochloromethane	0.05	ND	ND	ND
Chlorobenzene	0.05	0.61	ND	ND
Bromoform	0.05	ND	ND	ND
1,1,2,2-Tetrachloroethane	0.05	ND	ND	ND
1,3-Dichlorobenzene	0.1	ND	ND	ND
1,4-Dichlorobenzene	0.1	ND	ND	ND
1,2-Dichlorobenzene	0.1	ND	ND	ND

Approved by: Kevin Murphy Date: September 20, 1993

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: EMCON Associates
Project: Westinghouse Emeryville/0F88-001.15
Sample Matrix: Soil

Date Received: 09/13/93
Service Request No.: SJ93-1133

Halogenated Volatile Organic Compounds
EPA Methods 5030/8010
mg/Kg (ppm)
As Received Basis

Sample Name:		SB-31-1.5	SB-31-3.5	SB-32-1.5
Date Analyzed:		09/15/93	09/15/93	09/15/93
Analyte	**MRL**			
Dichlorodifluoromethane (Freon 12)	0.1	ND	ND	ND
Chloromethane	0.1	ND	ND	ND
Vinyl Chloride	0.05	ND	ND	ND
Bromomethane	0.05	ND	ND	ND
Chloroethane	0.05	ND	ND	ND
Trichlorofluoromethane (Freon 11)	0.05	ND	ND	ND
1,1-Dichloroethene	0.05	ND	ND	ND
Trichlorotrifluoroethane (Freon 113)	0.05	ND	ND	ND
Methylene Chloride	0.05	ND	ND	ND
trans-1,2-Dichloroethene	0.05	ND	ND	ND
cis-1,2-Dichloroethene	0.05	ND	ND	ND
1,1-Dichloroethane	0.05	ND	ND	ND
Chloroform	0.05	ND	ND	ND
1,1,1-Trichloroethane (TCA)	0.05	ND	ND	ND
Carbon Tetrachloride	0.05	ND	ND	ND
1,2-Dichloroethane	0.05	ND	ND	ND
Trichloroethene (TCE)	0.05	ND	ND	ND
1,2-Dichloropropane	0.05	ND	ND	ND
Bromodichloromethane	0.05	ND	ND	ND
2-Chloroethyl Vinyl Ether	0.5	ND	ND	ND
trans-1,3-Dichloropropene	0.05	ND	ND	ND
cis-1,3-Dichloropropene	0.05	ND	ND	ND
1,1,2-Trichloroethane	0.05	ND	ND	ND
Tetrachloroethene (PCE)	0.05	ND	ND	ND
Dibromochloromethane	0.05	ND	ND	ND
Chlorobenzene	0.05	ND	ND	ND
Bromoform	0.05	ND	ND	ND
1,1,2,2-Tetrachloroethane	0.05	ND	ND	ND
1,3-Dichlorobenzene	0.1	ND	ND	ND
1,4-Dichlorobenzene	0.1	ND	ND	ND
1,2-Dichlorobenzene	0.1	ND	ND	ND

Approved by: Kevin A Murphy Date: September 20, 1993

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: EMCON Associates
Project: Westinghouse Emeryville/0F88-001.15
Sample Matrix: Soil

Date Received: 09/13/93
Service Request No.: SJ93-1133

Halogenated Volatile Organic Compounds
EPA Methods 5030/8010
mg/Kg (ppm)
As Received Basis

Sample Name:		SB-32-3.5	Method Blank	Method Blank
Date Analyzed:		09/15/93	09/14/93	09/15/93
Analyte	**MRL**			
Dichlorodifluoromethane (Freon 12)	0.1	ND	ND	ND
Chloromethane	0.1	ND	ND	ND
Vinyl Chloride	0.05	ND	ND	ND
Bromomethane	0.05	ND	ND	ND
Chloroethane	0.05	ND	ND	ND
Trichlorofluoromethane (Freon 11)	0.05	ND	ND	ND
1,1-Dichloroethene	0.05	ND	ND	ND
Trichlorotrifluoroethane (Freon 113)	0.05	ND	ND	ND
Methylene Chloride	0.05	ND	ND	ND
trans-1,2-Dichloroethene	0.05	ND	ND	ND
cis-1,2-Dichloroethene	0.05	ND	ND	ND
1,1-Dichloroethane	0.05	ND	ND	ND
Chloroform	0.05	ND	ND	ND
1,1,1-Trichloroethane (TCA)	0.05	ND	ND	ND
Carbon Tetrachloride	0.05	ND	ND	ND
1,2-Dichloroethane	0.05	ND	ND	ND
Trichloroethene (TCE)	0.05	ND	ND	ND
1,2-Dichloropropane	0.05	ND	ND	ND
Bromodichloromethane	0.05	ND	ND	ND
2-Chloroethyl Vinyl Ether	0.5	ND	ND	ND
trans-1,3-Dichloropropene	0.05	ND	ND	ND
cis-1,3-Dichloropropene	0.05	ND	ND	ND
1,1,2-Trichloroethane	0.05	ND	ND	ND
Tetrachloroethene (PCE)	0.05	ND	ND	ND
Dibromochloromethane	0.05	ND	ND	ND
Chlorobenzene	0.05	ND	ND	ND
Bromoform	0.05	ND	ND	ND
1,1,2,2-Tetrachloroethane	0.05	ND	ND	ND
1,3-Dichlorobenzene	0.1	ND	ND	ND
1,4-Dichlorobenzene	0.1	ND	ND	ND
1,2-Dichlorobenzene	0.1	ND	ND	ND

Approved by: Kevin Murphy Date: September 20, 1993

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: EMCON Associates
Project: Westinghouse Emeryville/0F88-001.15
Sample Matrix: Soil

Date Received: 09/13/93
Date Extracted: 09/14/93
Work Order No.: SJ93-1133

Polychlorinated Biphenyls (PCBs)
EPA Methods 3550/8080
mg/Kg (ppm)
As Received Basis

Sample Name:		SB-25-1.5	SB-25-3.5	SB-26-1.5
Date Analyzed:		09/15/93	09/15/93	09/15/93
Analyte	**MRL**			
Aroclor 1016	0.1	ND	ND	ND
Aroclor 1221	0.1	ND	ND	ND
Aroclor 1232	0.1	ND	ND	ND
Aroclor 1242	0.1	ND	ND	ND
Aroclor 1248	0.1	ND	ND	ND
Aroclor 1254	0.1	ND	ND	ND
Aroclor 1260	0.1	ND	ND	0.1

Sample Name:		SB-26-3.5	SB-27-1.5	SB-27-3.5
Date Analyzed:		09/15/93	09/15/93	09/15/93
Analyte	**MRL**			
Aroclor 1016	0.1	<10. *	<1. *	ND
Aroclor 1221	0.1	<10. *	<1. *	ND
Aroclor 1232	0.1	<10. *	<1. *	ND
Aroclor 1242	0.1	<10. *	<1. *	ND
Aroclor 1248	0.1	<10. *	<1. *	ND
Aroclor 1254	0.1	<10. *	<1. *	ND
Aroclor 1260	0.1	46.	2.2	ND

* Raised MRL due to high analyte concentration requiring sample dilution.

Approved by: Kevin Murphy Date: September 20, 1993

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: EMCON Associates
Project: Westinghouse Emeryville/0F88-001.15
Sample Matrix: Soil

Date Received: 09/13/93
Date Extracted: 09/14/93
Work Order No.: SJ93-1133

Polychlorinated Biphenyls (PCBs)
EPA Methods 3550/8080
mg/Kg (ppm)
As Received Basis

Sample Name:		SB-28-1.5	SB-28-3.5	SB-29-1.5
Date Analyzed:		09/15/93	09/15/93	09/15/93
Analyte	**MRL**			
Aroclor 1016	0.1	ND	ND	<0.5 *
Aroclor 1221	0.1	ND	ND	<0.5 *
Aroclor 1232	0.1	ND	ND	<0.5 *
Aroclor 1242	0.1	ND	ND	<0.5 *
Aroclor 1248	0.1	ND	ND	<0.5 *
Aroclor 1254	0.1	ND	ND	<0.5 *
Aroclor 1260	0.1	0.1	ND	1.6

Sample Name:		SB-29-3.5	SB-30-1.5	SB-30-3.5
Date Analyzed:		09/15/93	09/15/93	09/15/93
Analyte	**MRL**			
Aroclor 1016	0.1	ND	ND	ND
Aroclor 1221	0.1	ND	ND	ND
Aroclor 1232	0.1	ND	ND	ND
Aroclor 1242	0.1	ND	ND	ND
Aroclor 1248	0.1	ND	ND	ND
Aroclor 1254	0.1	ND	ND	ND
Aroclor 1260	0.1	ND	0.2	ND

* Raised MRL due to high analyte concentration requiring sample dilution.

Approved by: Kevin A Murphy Date: September 20, 1993

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	EMCON Associates	**Date Received:**	09/13/93
Project:	Westinghouse Emeryville/0F88-001.15	**Date Extracted:**	09/14/93
Sample Matrix:	Soil	**Work Order No.:**	SJ93-1133

Polychlorinated Biphenyls (PCBs)
EPA Methods 3550/8080
mg/Kg (ppm)
As Received Basis

Sample Name:		SB-31-1.5	SB-31-3.5	SB-32-1.5
Date Analyzed:		09/15/93	09/15/93	09/15/93
Analyte	**MRL**			
Aroclor 1016	0.1	ND	<0.5 *	ND
Aroclor 1221	0.1	ND	<0.5 *	ND
Aroclor 1232	0.1	ND	<0.5 *	ND
Aroclor 1242	0.1	ND	<0.5 *	ND
Aroclor 1248	0.1	ND	<0.5 *	ND
Aroclor 1254	0.1	ND	<0.5 *	ND
Aroclor 1260	0.1	ND	1.0	ND

Sample Name:		SB-32-3.5	Method Blank
Date Analyzed:		09/15/93	09/15/93
Analyte	**MRL**		
Aroclor 1016	0.1	<0.5 *	ND
Aroclor 1221	0.1	<0.5 *	ND
Aroclor 1232	0.1	<0.5 *	ND
Aroclor 1242	0.1	<0.5 *	ND
Aroclor 1248	0.1	<0.5 *	ND
Aroclor 1254	0.1	<0.5 *	ND
Aroclor 1260	0.1	1.6	ND

* Raised MRL due to high analyte concentration requiring sample dilution.

Approved by: Kevin A. Murphy Date: September 20, 1993

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APPENDIX A

LABORATORY QC RESULTS

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COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	EMCON Associates	**Date Received:**	09/13/93
Project:	Westinghouse Emeryville/0F88-001.15	**Date Extracted:**	09/14/93
Sample Matrix:	Soil	**Service Request No.:**	SJ93-1133

Surrogate Recovery Summary
Hydrocarbon Scan
EPA Methods 3550/California DHS LUFT Method

Sample Name	Date Analyzed	Percent Recovery *p*-Terphenyl
SB-25-1.5	09/14/93	72.
SB-25-3.5	09/14/93	102.
SB-26-1.5	09/14/93	92.
SB-26-3.5	09/14/93	111.
SB-27-1.5	09/14/93	*
SB-27-3.5	09/14/93	102.
SB-28-1.5	09/14/93	107.
SB-28-3.5	09/14/93	87.
SB-29-1.5	09/14/93	96.
SB-29-3.5	09/14/93	82.
SB-30-1.5	09/14/93	105.
SB-30-3.5	09/14/93	106.
SB-31-1.5	09/14/93	104.
SB-31-3.5	09/14/93	99.
SB-32-1.5	09/14/93	101.
SB-32-3.5	09/14/93	104.
SB-25-3.5 (MS)	09/14/93	112.
SB-25-3.5 (DMS)	09/14/93	87.
SB-29-3.5 (MS)	09/14/93	99.
SB-29-3.5 (DMS)	09/14/93	122.
Method Blank	09/14/93	76.
	CAS Acceptance Criteria	46-154

* No surrogate spike recovery was calculated due to high sample concentration requiring a dilution.

Approved by: Keonia Murphy Date: September 20, 1993

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COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	EMCON Associates	**Date Received:**	09/13/93
Project:	Westinghouse Emeryville/0F88-001.15	**Date Extracted:**	09/14/93
Sample Matrix:	Soil	**Date Analyzed:**	09/14/93
		Service Request No.:	SJ93-1133

Matrix Spike/Duplicate Matrix Spike Summary
Hydrocarbon Scan
EPA Methods 3510/California DHS LUFT Method
mg/Kg (ppb)

Sample Name: SB-25-3.5

Analyte	Spike Level	Sample Result	Spike Result MS	Spike Result DMS	Percent Recovery MS	Percent Recovery DMS	CAS Acceptance Criteria
Diesel	100.	ND	118.	95.	118.	95.	61-121

Sample Name: SB-29-3.5

Analyte	Spike Level	Sample Result	Spike Result MS	Spike Result DMS	Percent Recovery MS	Percent Recovery DMS	CAS Acceptance Criteria
Diesel	100.	ND	105.	124.	105.	124.	61-121

Approved by: Kevin A Murphy Date: September 20, 1993

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COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: EMCON Associates
Project: Westinghouse Emeryville/0F88-001.15
Sample Matrix: Soil

Date Received: 09/13/93
Service Request No.: SJ93-1133

Surrogate Recovery Summary
BTEX and TPH as Gasoline
EPA Methods 5030/8020/California DHS LUFT Method

Sample Name	Date Analyzed	Percent Recovery α,α,α-Trifluorotoluene
SB-25-1.5	09/14/93	98.
SB-25-3.5	09/16/93	88.
SB-26-1.5	09/14/93	101.
SB-26-3.5	09/14/93	103.
SB-27-1.5	09/14/93	97.
SB-27-3.5	09/14/93	98.
SB-28-1.5	09/14/93	98.
SB-28-3.5	09/14/93	100.
SB-29-1.5	09/14/93	100.
SB-29-3.5	09/16/93	87.
SB-30-1.5	09/14/93	96.
SB-30-3.5	09/14/93	96.
SB-31-1.5	09/14/93	101.
SB-31-3.5	09/14/93	100.
SB-32-1.5	09/14/93	98.
SB-32-3.5	09/14/93	100.
SB-25-1.5 (MS)	09/14/93	101.
SB-25-1.5 (DMS)	09/14/93	100.
SB-29-3.5 (MS)	09/14/93	111.
SB-29-3.5 (DMS)	09/14/93	109.
Method Blank	09/14/93	99.
Method Blank	09/14/93	86.
CAS Acceptance Criteria	63-137	

Approved by: Tom Murphy Date: September 20, 1993

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COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: EMCON Associates
Project: Westinghouse Emeryville/0F88-001.15
Sample Matrix: Soil

Date Received: 09/13/93
Service Request No.: SJ93-1133

Matrix Spike/Duplicate Matrix Spike Summary
BTEX
EPA Methods 5030/8020
mg/Kg (ppm)
As Received Basis

Sample Name: SB-25-1.5
Date Analyzed: 09/14/93

Analyte	Spike Level	Sample Result	Spike Result MS	Spike Result DMS	Percent Recovery MS	Percent Recovery DMS	CAS Acceptance Criteria
Benzene	2.5	ND	2.43	2.51	97.	100.	39-150
Toluene	2.5	ND	2.46	2.53	98.	101.	46-148
Ethylbenzene	2.5	ND	2.34	2.49	94.	100.	32-160

Approved by: Kevin M Murphy Date: September 20, 1993

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COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: EMCON Associates
Project: Westinghouse Emeryville/0F88-001.15
Sample Matrix: Soil

Date Received: 09/13/93
Service Request No.: SJ93-1133

Matrix Spike/Duplicat Matrix Spike Summary
TPH as Gasoline
EPA Methods 5030/California DHS LUFT Method
mg/Kg (ppm)
As Received Basis

Sample Name: SB-29-3.5
Date Analyzed: 09/14/93

Analyte	Spike Level	Sample Result	Spike Result MS	Spike Result DMS	Percent Recovery MS	Percent Recovery DMS	CAS Acceptance Criteria
TPH as Gasoline	25.	ND	25.4	25.6	102.	102.	70-130

Approved by: Kevin A Murphy Date: September 20, 1993

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COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: EMCON Associates
Project: Westinghouse Emeryville/0F88-001.15
Sample Matrix: Soil

Date Received: 09/13/93
Service Request No.: SJ93-1133

Surrogate Recovery Summary
Halogenated Volatile Organic Compounds
EPA Methods 5030/8010

Sample Name	Date Analyzed	Percent Recovery 4-Bromofluorobenzene
SB-25-1.5	09/14/93	110.
SB-25-3.5	09/14/93	93.
SB-26-1.5	09/14/93	101.
SB-26-3.5	09/14/93	99.
SB-27-1.5	09/14/93	109.
SB-27-3.5	09/14/93	83.
SB-28-1.5	09/14/93	99.
SB-28-3.5	09/14/93	104.
SB-29-1.5	09/14/93	107.
SB-29-3.5	09/15/93	107.
SB-30-1.5	09/14/93	101.
SB-30-3.5	09/15/93	107.
SB-31-1.5	09/15/93	128.
SB-31-3.5	09/15/93	92.
SB-32-1.5	09/15/93	111.
SB-32-3.5	09/15/93	107.
SB-25-1.5 (MS)	09/14/93	102.
SB-25-1.5 (DMS)	09/14/93	103.
SB-29-3.5 (MS)	09/15/93	94.
SB-29-3.5 (DMS)	09/15/93	104.
Method Blank	09/14/93	99.
Method Blank	09/15/93	99.
	CAS Acceptance Criteria	70-130

Approved by: Kevin A Murphy Date: September 20, 1993

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COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: EMCON Associates
Project: Westinghouse Emeryville/0F88-001.15
Sample Matrix: Soil

Date Received: 09/13/93
Service Request No.: SJ93-1133

Matrix Spike/Duplicate Matrix Spike Summary
Halogenated Volatile Organic Compounds
EPA Methods 5030/8010
mg/Kg (ppm)

Sample Name: SB-25-1.5
Date Analyzed: 09/14/93

Analyte	Spike Level	Sample Result	Spike Result MS	Spike Result DMS	Percent Recovery MS	Percent Recovery DMS	EPA Acceptance Criteria
1,1-Dichloroethene	0.50	ND	0.45	0.51	90.	102.	28-167
Trichloroethene	0.50	ND	0.44	0.51	88.	102.	35-146
Tetrachloroethene	0.50	ND	0.41	0.47	82.	94.	26-162

Sample Name: SB-29-3.5
Date Analyzed: 09/15/93

Analyte	Spike Level	Sample Result	Spike Result MS	Spike Result DMS	Percent Recovery MS	Percent Recovery DMS	EPA Acceptance Criteria
1,1-Dichloroethene	0.50	ND	0.49	0.46	98.	92.	28-167
Trichloroethene	0.50	ND	0.50	0.51	100.	102.	35-146
Tetrachloroethene	0.50	ND	0.46	0.46	92.	92.	26-162

Approved by: Leon A Murphy Date: September 20, 1993

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COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: EMCON Associates
Project: Westinghouse Emeryville/0F88-001.15
Sample Matrix: Soil

Date Received: 09/13/93
Work Order No.: SJ93-1133

Surrogate Recovery Summary
Polychlorinated Biphenyls (PCBs)
EPA Methods 3550/8080

Sample Name	Date Analyzed	Percent Recovery Decachlorobiphenyl
SB-25-1.5	09/15/93	78.
SB-25-3.5	09/15/93	82.
SB-26-1.5	09/15/93	77.
SB-26-3.5	09/15/93	*
SB-27-1.5	09/15/93	39. **
SB-27-3.5	09/15/93	66.
SB-28-1.5	09/15/93	74. ***
SB-28-3.5	09/15/93	76. ***
SB-29-1.5	09/15/93	91.
SB-29-3.5	09/15/93	82. ***
SB-30-1.5	09/15/93	73. ***
SB-30-3.5	09/15/93	81. ***
SB-31-1.5	09/15/93	75. ***
SB-31-3.5	09/15/93	79.
SB-32-1.5	09/15/93	81.
SB-32-3.5	09/16/93	81.
SB-25-1.5 (MS)	09/15/93	87.
SB-25-1.5 (DMS)	09/15/93	85.
SB-30-1.5 (MS)	09/15/93	81. ***
SB-30-1.5 (DMS)	09/15/93	74. ***
Method Blank	09/14/93	85.
	CAS Acceptance Criteria	53-120

* No surrogate spike recovery was calculated due to high sample concentration requiring a dilution.

** Surrogate Recovery was outside acceptance limits due to matrix effect. Sample contained non-target components that interfere with surrogate recovery. The sample was not reanalyzed.

*** The surrogate used for this sample was Tetrachloro-*m*-xylene.

Approved by: Kevin A Murphy Date: September 20, 1993

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COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: EMCON Associates
Project: Westinghouse Emeryville/0F88-001.15
Sample Matrix: Soil

Date Received: 09/13/93
Date Extracted: 09/14/93
Date Analyzed: 09/15/93
Work Order No.: SJ93-1133

Matrix Spike/Duplicate Matrix Spike Summary
Polychlorinated Biphenyls (PCBs)
EPA Methods 3550/8080
mg/Kg (ppm)
As Received Basis

Sample Name: SB-25-1.5

Analyte	Spike Level	Sample Result	Spike Result MS	Spike Result DMS	Percent Recovery MS	Percent Recovery DMS	CAS Acceptance Criteria	Relative Percent Difference
Aroclor 1260	0.167	ND	0.154	0.148	92.	89.	62-154	4.

Sample Name: SB-30-1.5

Analyte	Spike Level	Sample Result	Spike Result MS	Spike Result DMS	Percent Recovery MS	Percent Recovery DMS	CAS Acceptance Criteria	Relative Percent Difference
Aroclor 1260	0.167	0.157	0.276	0.278	71.	72.	62-154	1.

Approved by: Kevin A Murphy Date: September 20, 1993

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APPENDIX B

CHAIN OF CUSTODY

1921 Ringwood Avenue • San Jose, California 95131 • Telephone 408/437-2400 • Fax 408/437-9356

Columbia Analytical Services, Inc.

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CHAIN OF CUSTODY/LABORATORY ANALYSIS REQUEST FORM

DATE 9/13/93 PAGE _____ OF _____

PROJECT NAME Westinghouse Emeryville # OF88.001.15

PROJECT MNGR. M. Smeller

COMPANY/ADDRESS EMCON Assoc

PHONE _____

SAMPLERS SIGNATURE [signature]

SAMPLE I.D.	DATE	TIME	LAB I.D.	SAMPLE MATRIX	NUMBER OF CONTAINERS	Base/Neu/Acid Organics GC/MS 625/8270	Volatile Organics GC/MS 624/8240	Halogenated or Aromatic Volatiles 601(8010) (8021) 602(8020)	(TPH as Gas BTEX) DHS LUFT / 8020	TPH as Diesel (BHC) DHS LUFT	TRPH - 418.1	Oil and Grease Method	Metals (total or dissolved) List Below	pH, Cond, Cl, SO_4, PO4, F, NO_2 Alk, TDS, TSS (circle)	NH_3-N, COD, Total-P, TKN, NO_3 (circle)	Total Organic Carbon TOC 415/9060	Total Phenols	PCB (8080)	REMARKS
SB-25-1.5	9/13/93	11:50	1	Soil	2			X		X								X	
SB-25-3.5		12:07	2		1														
SB-26-1.5		12:15	3																
SB-26-3.5		12:23	4																
SB-27-1.5		12:57	5																
SB-27-3.5		13:07	6																
SB-28-1.5		10:21	7																
SB-28-3.5		10:29	8																
SB-29-1.5		10:39	9																
SB-29-3.5		10:51	10																

ANALYSIS REQUESTED

RELINQUISHED BY:

Signature [signature]

Printed Name Bart Stafford

Firm EMCON

Date/Time 9/13/93 1710

RECEIVED BY:

Signature [signature]

Printed Name JOHN TRUONG

Firm CAS/SJ

Date/Time 9/17/93 1110

RELINQUISHED BY:

Signature

Printed Name

Firm

Date/Time

RECEIVED BY:

Signature

Printed Name

Firm

Date/Time

TURNAROUND REQUIREMENTS:

___ 24 hr X 48 hr ___ 5 day

___ Standard (~ 10-15 working days)

___ Provide Verbal Preliminary Results

___ Provide FAX Preliminary Results

Requested Report Date _____

REPORT REQUIREMENTS

X I. Routine Report

X II. Report (includes DUP,MS, MSD, as required, may be charged as samples)

___ III. Data Validation Report (includes All Raw Data)

___ IV.CLP Deliverable Report

INVOICE INFORMATION:

P.O. # _____

Bill to: _____

SAMPLE RECEIPT:

Shipping VIA: SAMPLER

Shipping #: _____

Condition: OKAY

Lab No.: SJ93-1133

SPECIAL INSTRUCTIONS/COMMENTS:

9-14-93 NUTAN ADDED GBTXE, TIER II QC

DISTRIBUTION: WHITE - return to originator; YELLOW - lab; PINK - retained by originator

400-05

Columbia Analytical Services, INC.

1921 Ringwood Ave. • San Jose, CA 95131 • (408) 437-2400, FAX (408)437-9356

CHAIN OF CUSTODY/LABORATORY ANALYSIS REQUEST FORM

DATE 9/13/93 PAGE _____ OF _____

PROJECT NAME Westinghouse, Emeryville # OF88.001.15

PROJECT MNGR. M. Smolley

COMPANY/ADDRESS EMCON

PHONE

SAMPLERS SIGNATURE

SAMPLE I.D.	DATE	TIME	LAB I.D.	SAMPLE MATRIX	NUMBER OF CONTAINERS	Base/Neu/Acid Organics GCMS 625/8270	Volatile Organics GCMS 624/8240	Halogenated or Aromatic Volatiles 601(8010) 602(8020)	GRH as Gas/BTEX DHS LUFT / 8020	TPH as Diesel (HBHC) DHS LUFT	TRPH - 418.1	Oil and Grease Method	Metals (total or dissolved) List Below	pH, Cond, Cl, SO_4, PO_4, F, NO_2, Alk, TDS, TSS (circle)	NH_3-N, COD, Total-P, TKN, NO_3 (circle)	Total Organic Carbon TOC 415/9060	Total Phenols	PCB (8080)				REMARKS
SB-30-1.5	9/13/93	10:00	11	Soil	1			X	X	X								X				
SB-30-3.5		10:12	12																			
SB-31-1.5		10:55	13																			
SB-31-3.5		11:08	14																			
SB-32-1.5		11:23	15																			
SB-32-3.5		11:30	16																			

RELINQUISHED BY:

Signature

Printed Name Dave Stafford

Firm EMCON

Date/Time 9/13/93 17:10

RECEIVED BY:

Signature

Printed Name JOHN TRUONG

Firm CAS/SJ

Date/Time 9/13/93 1710

RELINQUISHED BY:

Signature

Printed Name

Firm

Date/Time

RECEIVED BY:

Signature

Printed Name

Firm

Date/Time

TURNAROUND REQUIREMENTS:

___ 24 hr X 48 hr ___ 5 day

___ Standard (~ 10-15 working days)

___ Provide Verbal Preliminary Results

___ Provide FAX Preliminary Results

Requested Report Date _____

REPORT REQUIREMENTS

X I. Routine Report

X II. Report (includes DUP,MS, MSD, as required, may be charged as samples)

___ III. Data Validation Report (includes All Raw Data)

___ IV.CLP Deliverable Report

INVOICE INFORMATION:

P.O. # _____

Bill to: _____

SAMPLE RECEIPT:

Shipping VIA: SAMPACK

Shipping #: _____

Condition: OKAY

Lab No.: 5593-1133

SPECIAL INSTRUCTIONS/COMMENTS:

9-14-93 NUTAN ADDED GBTXE, TIER II QC

DISTRIBUTION: WHITE - return to originator; YELLOW - lab; PINK - retained by originator

400-05

APPENDIX B

EVALUATION OF LABORATORY QUALITY CONTROL RESULTS

EVALUATION OF LABORATORY QUALITY CONTROL RESULTS

The laboratory quality control (QC) review consisted of checking adherence to the required holding times for all analyses and evaluating laboratory method blanks, surrogate spike recoveries, matrix spike (MS), and matrix spike duplicate (MSD) recoveries, and method reporting limits (MRLs).

All analyses were performed within the required holding times. No parameters were detected in the method blanks above their respective MRLs. Surrogate recoveries were within the established acceptance criteria, with the following exceptions.

The surrogate spike recoveries for sample SB-27-1.5 analyzed for high-boiling-point hydrocarbons (HBHC) by the DHS Leaking Underground Fuel Tank method and sample SB-26-3.5 analyzed for polychlorinated biphenyls (PCBs) by U.S. Environmental Protection Agency (EPA) method 8080 were not calculated because of high analyte concentration requiring sample dilution. The surrogate spike recovery for sample SB-27-1.5 analyzed for PCBs by EPA method 8080 was below the acceptance limit because of matrix interference. Because the surrogate recoveries in other samples were acceptable, data quality does not appear to be affected.

MS and MSD recoveries were within the established acceptance criteria, indicating acceptable data accuracy. The relative percent differences (RPDs) between MS and MSD recoveries were also within the established criteria, indicating acceptable data precision.

Routine MRLs were used to quantify and report the analytical results, with the following exceptions. Matrix interference resulted in elevated MRL for sample SB-26-3.5 analyzed for volatile organic compounds analyzed by the EPA method 8020. High analyte concentration requiring sample dilution to quantitate the analyte concentration in the sample resulted in elevated MRLs for samples SB-26-3.5, SB-29-1.5, SB-31-3.5, and SB-32-3.5 analyzed for PCBs by the EPA method 8080. The data quality does not appear to be affected.

A review of the laboratory QC data indicates that the data are of acceptable quality and can be used for site characterization.

EMCON Associates
Project 0F88-001.15
93SC1.XLS
9/24/93

Table 1

Soil Analytical Results

Units: mg/kg (1)

Boring Number	Depth (feet)	Sample Date	Aroclor 1260 (2)	TPHD (3)	Hydraulic Oil	TPHG (4)	Chloro-benzene	1,3-Dichloro-benzene	1,4-Dichloro-benzene	1,2-Dichloro-benzene
SB-1	1.5	06/18/93	<0.1	<1	**31**	ND (6)	<0.05	<0.1	<0.1	<0.1
SB-1	3	06/18/93	<0.1	<1	<5	ND	<0.05	<0.1	<0.1	<0.1
SB-2	1.5	06/17/93	<0.1	<1	<5	ND	<0.05	<0.1	<0.1	<0.1
SB-2	3	06/17/93	<0.1	<1	<5	ND	<0.05	<0.1	<0.1	<0.1
SB-3	1.5	06/17/93	<0.1	**2**	<5	ND	<0.05	<0.1	<0.1	<0.1
SB-3	3	06/17/93	<0.1	<1	**11**	ND	<0.05	<0.1	<0.1	<0.1
SB-4	1.5	06/17/93	<0.1	<1	**9**	ND	<0.05	<0.1	<0.1	<0.1
SB-4	3	06/17/93	<0.1	<1	<5	ND	<0.05	<0.1	<0.1	<0.1
SB-6	4.5	06/18/93	<0.1	<10	**680**	ND	<0.05	<0.1	<0.1	<0.1
SB-7	1.5	06/17/93	<0.1	<1	**17**	ND	<0.05	<0.1	<0.1	<0.1
SB-7	3	06/17/93	<0.1	<1	**18**	ND	<0.05	<0.1	<0.1	<0.1
SB-8	1.5	06/17/93	**1**	<10	**190**	ND	<0.05	<0.1	<0.1	<0.1
SB-8	3	06/17/93	<0.1	<1	**21**	ND	<0.05	<0.1	<0.1	<0.1
SB-9	1.5	06/17/93	<0.1	<1	<5	ND	<0.05	<0.1	<0.1	<0.1
SB-9	3	06/17/93	<0.1	<1	<5	ND	<0.05	<0.1	<0.1	<0.1
SB-10	1.5	06/17/93	<0.1	<1	**41**	ND	<0.05	<0.1	<0.1	<0.1
SB-10	3	06/17/93	<0.1	<10	**320**	ND	<0.05	<0.1	<0.1	<0.1
SB-11	1.5	06/17/93	<0.1	<1	<5	ND	<0.05	<0.1	<0.1	<0.1
SB-11	3	06/17/93	<0.1	<1	**28**	ND	<0.05	<0.1	<0.1	<0.1
SB-12	1.5	06/17/93	<0.1	<1	**30**	ND	<0.05	<0.1	<0.1	<0.1
SB-12	3	06/17/93	<0.1	**9400 (7)**	<500	ND	<0.05	<0.1	<0.1	<0.1
SB-13	1.5	06/17/93	<0.1	<1	<5	ND	<0.05	<0.1	<0.1	<0.1
SB-13	3	06/17/93	<0.1	<1	<5	ND	<0.05	<0.1	<0.1	<0.1
SB-14	1.5	06/17/93	<0.1	<1	**11**	ND	<0.05	<0.1	<0.1	<0.1
SB-14	3	06/17/93	<0.1	<1	<5	ND	<0.05	<0.1	<0.1	<0.1
SB-15	1.5	06/17/93	<0.1	<1	<5	ND	<0.05	<0.1	<0.1	<0.1
SB-15	3	06/17/93	<0.1	<1	<5	ND	<0.05	<0.1	<0.1	<0.1
SB-16	1.5	06/17/93	<0.1	<1	<5	ND	<0.05	<0.1	<0.1	<0.1
SB-16	3	06/17/93	<0.1	<1	<5	ND	<0.05	<0.1	<0.1	<0.1
SB-17	1.5	06/17/93	<0.1	<1	<5	ND	<0.05	<0.1	<0.1	<0.1
SB-17	3	06/17/93	<0.1	<1	<5	ND	<0.05	<0.1	<0.1	<0.1
SB-18	1.5	06/18/93	<0.1	<1	**21**	ND	<0.05	<0.1	<0.1	<0.1
SB-18	3	06/18/93	<0.1	<1	<5	ND	<0.05	<0.1	<0.1	<0.1
SB-19	1.5	06/18/93	<0.1	<1	<5	ND	<0.05	<0.1	<0.1	<0.1
SB-19	3	06/18/93	<0.1	<1	<5	ND	<0.05	<0.1	<0.1	<0.1
SB-20	1.5	06/17/93	<0.1	<1	<5	ND	<0.05	<0.1	<0.1	<0.1
SB-20	3	06/17/93	<0.1	<1	<5	ND	<0.05	<0.1	<0.1	<0.1

EMCON Associates
Project 0F88-001.15
93SC1.XLS
9/24/93

Table 1

Soil Analytical Results
(continued)

Units: mg/kg (1)

Boring Number	Depth (feet)	Sample Date	Aroclor 1260 (2)	TPHD (3)	Hydraulic Oil	TPHG (4)	Chloro-benzene	1,3-Dichloro-benzene	1,4-Dichloro-benzene	1,2-Dichloro-benzene
SB-21	1.5	06/18/93	**0.2**	<1	<5	ND	<0.05	<0.1	<0.1	<0.1
SB-21	3	06/18/93	<0.1	<1	**8**	ND	<0.05	<0.1	<0.1	<0.1
SB-22	1.5	06/18/93	<0.1	<1	<5	ND	<0.05	<0.1	<0.1	<0.1
SB-22	3	06/18/93	<0.1	<1	<5	ND	<0.05	<0.1	<0.1	<0.1
SB-23	1.5	06/17/93	<0.1	<1	<5	ND	<0.05	<0.1	<0.1	<0.1
SB-23	3	06/17/93	<0.1	<1	<5	ND	<0.05	<0.1	<0.1	<0.1
SB-24	1.5	06/18/93	<0.1	<1	<5	ND	<0.05	<0.1	<0.1	<0.1
SB-24	3	06/18/93	<0.1	<1	<5	ND	<0.05	<0.1	<0.1	<0.1
SB-25	1.5	09/13/93	<0.1	<1	<5	ND	<0.05	<0.1	<0.1	<0.1
SB-25	3.5	09/13/93	<0.1	<1	<5	ND	<0.05	<0.1	<0.1	<0.1
SB-26	1.5	09/13/93	0.1	<1	<5	ND	<0.05	<0.1	<0.1	<0.1
SB-26	3.5	09/13/93	46	<1	1100	36 (8)	1.8	6.6	15	0.4
SB-27	1.5	09/13/93	2.2	<1	4100	ND	<0.05	<0.1	<0.1	<0.1
SB-27	3.5	09/13/93	<0.1	<1	79	ND	<0.05	<0.1	<0.1	<0.1
SB-28	1.5	09/13/93	0.1	<1	<5	ND	<0.05	<0.1	<0.1	<0.1
SB-28	3.5	09/13/93	<0.1	<1	<5	ND	<0.05	<0.1	<0.1	<0.1
SB-29	1.5	09/13/93	1.6	<1	84	ND	0.67	<0.1	<0.1	<0.1
SB-29	3.5	09/13/93	<0.1	<1	<5	ND	0.61	<0.1	<0.1	<0.1
SB-30	1.5	09/13/93	0.2	<1	79	ND	<0.05	<0.1	<0.1	<0.1
SB-30	3.5	09/13/93	<0.1	<1	29	ND	<0.05	<0.1	<0.1	<0.1
SB-31	1.5	09/13/93	<0.1	<1	<5	ND	<0.05	<0.1	<0.1	<0.1
SB-31	3.5	09/13/93	1.0	<1	39	ND	<0.05	<0.1	<0.1	<0.1
SB-32	1.5	09/13/93	<0.1	<1	<5	ND	<0.05	<0.1	<0.1	<0.1
SB-32	3.5	09/13/93	1.6	<1	<5	ND	<0.05	<0.1	<0.1	<0.1

(1) mg/kg = milligrams per kilogram
(2) Aroclors analyzed by Environmental Protection Agency (EPA) method 8080.
(3) TPHD = total petroleum hydrocarbons as diesel.
(4) TPHG = total petroleum hydrocarbons as gasoline.
(5) VOC = volatile organic compounds analyzed by EPA methods 8010 and 8020.
(6) ND = not detected above their respective method reporting limits (MRLs). See certified analytical reports in Appendix A for MRLs.
(7) Unknown high boiling point hydrocarbon in the volatility range of diesel. Chromatogram does not match the typical diesel pattern.
(8) Sample contains components in the volatility range of gasoline. Chromatogram does not match the typical gasoline pattern.

Note: SB-5 not sampled because of an obstruction at 4 feet.
SB-6 not sampled below 4.5 feet because of saturated soils.