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GEOMATRIX

8 May 1990
Project 1459.05

Mr. John Adams, Project Manager
Kaiser Foundation Health Plan
1950 Franklin Street, 11th Floor
Oakland, California 94612-2998

Subject: Site Characterization - Mineral Spirits in Soil
Kaiser Permanente Medical Center
280 West MacArthur Boulevard
Oakland, California

Dear Mr. Adams:

Enclosed is the subject report for characterization of soil affected by mineral spirits at the Kaiser Permanente Medical Center construction site behind the hospital on Broadway. A copy of this report should be sent to Ms. Susan Hugo at the Alameda County Department of Health Services and to Mr. Lester Feldman at the California Regional Water Quality Control Board.

We appreciate the opportunity to provide our consulting engineering services to Kaiser. Please contact Ms. Cheri Young or either of the undersigned, if you have any questions of require further information.

Sincerely yours,
GEOMATRIX CONSULTANTS, INC.

N. Debra Favre
Project Manager

Thomas E. Graf
Project Director

NDF/evr

Enclosure

cc: Ms. Fonda Karelitz - Kaiser Foundation Health Plan
Ken Ayers - Kaiser Permanente Medical Center
Mark Zemelman - McCutchen, Doyle, Brown & Enersen

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SITE CHARACTERIZATION REPORT
Mineral Spirits in Soil

Prepared for

Kaiser Permanente Medical Center
280 W. MacArthur Boulevard
Oakland, California

May 1990
Project No. 1459C/E

Geomatrix Consultants

GEOMATRIX

SITE CHARACTERIZATION REPORT
MINERAL SPIRITS IN SOIL
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SITE CHARACTERIZATION - MINERAL SPIRITS IN SOIL
KAISER PERMANENTE MEDICAL CENTER
Oakland, California

1.0 INTRODUCTION

1.1 Purpose

At the request of the Kaiser Foundation Health Plan (Kaiser), Geomatrix conducted a series of studies to characterize the extent of mineral spirits in soil behind Kaiser Permanente Medical Center (Kaiser Hospital), at 280 West MacArthur Boulevard in Oakland, California (Figure 1). This report summarizes our findings and presents our recommended plan for remediation of soil affected by mineral spirits.

1.2 Site Conditions

The Kaiser Hospital site is located behind the hospital tower and is entered from Broadway, as shown on Figure 1. The site is essentially level and paved. Permanent structures on the site include the mechanical building, a cooling tower, and an emergency water tank, which are shown on Figure 2. Temporary structures include a Kaiser Construction Services office trailer and a shipping container used for storage. The east boundary of the site is a hillside leading to a grassy picnic area used by Kaiser personnel. The south boundary of the site is the recessed footing of the linen building, which is approximately four feet wide and four feet below the asphalt grade. The west and north boundaries of the site are marked by a chain-link fence.

2.0 SUMMARY OF WORK PERFORMED

During Kaiser's excavation for a new sewer line trench between the mechanical and linen buildings at the Hospital, construction workers noted an unusual odor. Kaiser retained Geomatrix Consultants, Inc. (Geomatrix), to collect soil samples from the trench and identify the odoriferous substance. A soil sample was collected from below the trench backfill near a

rusty joint in a drain line leading from a paint clean-up basin. The basin is shown on Figure 2. Laboratory analysis of the sample detected mineral spirits, benzene, and toluene at concentrations of 2600, 0.4, and 1.0 parts per million (ppm), respectively. Based on this finding, Kaiser requested Geomatrix to assess the extent of mineral spirits in the soil in this area.

Characterization of the extent of mineral spirits in soil near the mechanical building began in November 1989. Six soil borings were drilled to depths of 10 and 15 feet within 20 feet of the mechanical building (see Figure 2). Three to four samples per boring were analyzed for total fuel hydrocarbons and benzene, toluene, xylene, and ethylbenzene (BTX&E). Mineral spirits were detected in only one boring, B-2, located near the intersection of the mechanical and linen buildings, at a maximum concentration of 80 milligrams per kilogram (mg/kg) at a depth of 9.5 feet. Based on the results of this boring program Geomatrix estimated that approximately 25 cubic yards of soil were affected by mineral spirits. The results also indicated that the soil containing mineral spirits did not pose a significant present or potential hazard to human health and safety, property, or the environment.

Excavation of soil containing detectable mineral spirits was initiated on 12 February 1990 just west of the mechanical building near the paint basin discharge line (Figure 2 - Excavation #1). The excavation was completed in the north, west, and south directions, and Geomatrix obtained confirmation soil samples. The sample results indicated soils containing detectable mineral spirits had been removed, except in the area below the mechanical building foundation.

Kaiser Construction Services abandoned excavation activities west of the mechanical building, while Geomatrix conducted a drilling and soil sampling program within and around the mechanical building to define the extent of mineral spirits in this area. Between 27 February and 2 March 1990 Geomatrix drilled six borings within the mechanical building and 13 borings along the east and north sides of the building, as shown on Figure 2.

Concurrent with Geomatrix's drilling program to define the extent of mineral spirits in soil within and around the mechanical building, Kaiser Construction Services began excavating the hillside northeast of the mechanical building (Figure 2 - Excavation #2). These soils also were observed to contain elevated concentrations of mineral spirits. At Kaiser's request Geomatrix conducted a drilling and soil sampling program on the hillside to determine the extent of soil containing mineral spirits in this area. Geomatrix drilled eight borings around the hillside excavation between 12 and 15 March 1990, as shown on Figure 2.

At Kaiser's request, on 16 March 1990 additional soil borings were drilled on the north and east sides of the original Excavation #1 near the mechanical building to confirm the absence of mineral spirits in these areas. The boring locations are shown on Figure 2.

3.0 FIELD INVESTIGATION

Logs for borings drilled to characterize the site are presented in Appendix A. Summarized in Appendix B are the field methods used for the work initiated in February 1990, to observe and document excavation activities and to more fully characterize soil affected by mineral spirits at the site.

All soil samples collected for chemical analysis from the excavations and borings were delivered to BC Analytical of Emeryville, California, under chain-of-custody procedures. Samples were analyzed for total petroleum hydrocarbons as mineral spirits as well as benzene, toluene, xylene, and ethylbenzene (BTX&E) by EPA Methods 8015/8020 in series. The reporting limits for these compounds are 10 milligrams per kilogram (mg/kg) for mineral spirits and 0.3 mg/kg for BTX&E. Analytical results are tabulated in Table 1; laboratory reports and chain-of-custody records are presented in Appendix C.

4.0 RESULTS

Summarized below are the results of the site characterization and excavation observation work conducted to date. The data from the different phases of work were assembled to define the extent of soil affected by mineral spirits at the site. Described in the following sections is the extent of soil affected by mineral spirits.

4.1 Paint Shed/Mechanical Building Area

This area is the location of Excavation # 1. The limits of the excavation are shown on Figure 2. The excavation was bounded on the east by the edge of the mechanical building and on the south by a retaining wall between the asphalt parking area and the linen building. The vertical extent of the excavation was approximately 6 feet on the west side and 12 feet on the east side, as shown in the cross section, Figure 3.

Five confirmation soil samples (E-1 through E-5) were collected in February 1990 from the north, west, and southwest walls and floor of the excavation. Mineral spirits and BTX&E were not detected in these samples, indicating that soils containing mineral spirits in excess of 10 mg/kg had been removed from the excavation in these directions (Table 1). The vertical extent of mineral spirits just west of the mechanical building foundation was found after the excavation of the building basement and foundation was completed on 25 April 1990. One soil sample (E-6) was collected at the base of the excavation at a depth of 13 feet in this location, and mineral spirits and BTX&E were not detected indicating that the excavation of soil containing mineral spirits was complete in this area. Volatile organic compounds (VOCs) were detected in soil from the excavation east wall using a photoionization detector (PID). A blue-green soil discoloration and a hydrocarbon odor also provided evidence that the excavation was not complete in the eastern direction below the mechanical building.

4.2 Mechanical Building Interior

Based on the soil discoloration and high PID readings at the east wall of the excavation, a 12-foot-long horizontal boring was drilled with a hand auger approximately five feet below the

mechanical building to determine the extent of affected soils in this direction. The soils encountered were screened continuously with the PID and showed positive readings to approximately 11.5 feet. These readings indicate that soils with detectable mineral spirits extend approximately 11.5 feet under the west edge of the mechanical building.

Two of the six borings drilled within the mechanical building contained soils in which mineral spirits were detected. The boring locations are shown on Figure 2, with the depth range of soil where VOCs were detected by the PID. Figure 3 shows the extent of affected soil beneath the mechanical building in cross section. Boring MB-1 showed the greatest vertical extent and concentration of mineral spirits. Samples screened using the PID indicated detectable VOCs from a depth of 1.0 to approximately 18.0 feet. A laboratory analysis of soil from a depth of 18.5 feet detected no mineral spirits or BTX&E confirming the limits of mineral spirits in the area of boring MB-1. Samples screened using the PID readings from boring MB-2 indicated detectable VOCs (at least 10 ppm) from a depth of approximately 3.5 to 9.5 feet. Borings MB-3 through MB-6 revealed no detectable VOCs; laboratory analyses confirmed the absence of mineral spirits. Based on these borings and analytical results, the volume of soil that contains detectable mineral spirits beneath the mechanical building was estimated to be 120 to 190 cubic yards.

Groundwater was encountered in borings MB-1 and MB-2 at depths of approximately 18.0 and 17.5 feet, respectively. Surface infiltration water was encountered in boring MB-4 due to a surface mechanical installation. Groundwater was not encountered in borings MB-3, MB-5, or MB-6. Although no groundwater samples were analyzed, a soil sample acquired from just below the water table for laboratory analysis (MB-1 at a depth of 18.5 feet) contained no detectable mineral spirits, indicating that the mineral spirits do not extend below the water table at significant concentrations.

4.3 Mechanical Building Exterior

Five of the 13 borings drilled along the north and east perimeters of the mechanical building encountered soil having detectable VOCs (detected using PID) while the remaining eight borings showed no indication of detectable VOCs. Eleven laboratory confirmation samples were analyzed, and only sample B-12 to a depth of 5.0 feet had a detectable concentration of mineral spirits (34 mg/kg). Benzene, toluene, xylenes, and ethylbenzene were also detected in this sample, with concentrations of 0.6, 0.6, 1.4, and 0.6 mg/kg, respectively. The lateral and vertical extent of affected soil, as shown on Figure 2, includes the area east of the cooling tower and south of the hillside. The vertical extent of detectable mineral spirits in most of the area appears to range from four to seven feet except near boring B-15 at the base of the hillside, where VOCs were detected by the PID to a depth of approximately 17 feet (Figure 5). The volume of affected soil between the mechanical building and the hillside above a depth of seven feet is estimated to be 100 cubic yards. Groundwater was encountered in boring B-15 at a depth of approximately 17 feet, coinciding with the limits of soil affected by mineral spirits.

Five borings drilled just north of the excavation (B-27 through B-31) were screened with the PID. VOCs were not detected in the soil samples tested with a PID from the borings, and it appears that detectable mineral spirits are not present in this area.

4.4 Hillside Area

Two of the eight borings drilled on the hillside above Excavation # 2 (B-20 through B-26 and B-32) encountered soil with detectable concentrations of mineral spirits. In boring B-21 VOCs were detected using the PID to a depth of approximately 12 feet, and samples analyzed in the laboratory from depths of 2.0 and 14.0 feet confirmed the detection of mineral spirits (at 33 mg/kg and <10 mg/kg, respectively). In boring B-24, VOCs were detected using the PID to a depth of approximately 30 feet. A sample analyzed in the laboratory confirmed the limit of soil with detectable mineral spirits ended at a depth of 30.0 feet. The lateral extent of soil having detectable mineral spirit concentrations is shown on Figure 2. Figure 4 is a cross section through the hillside showing the zone of greatest vertical extent of mineral

spirits. Based on these borings and analytical results, the volume of soil in the hillside affected by mineral spirits was estimated to be 500 to 600 cubic yards. The groundwater table appears to be at a depth greater than 30 feet below the top of hillside.

One soil sample was also analyzed for volatile organics, semi-volatile organics, and the 17 California Title 26 (CAM) metals. The sample was from boring B-24 at a depth of 6.0 feet, an area known to be affected by mineral spirits. The laboratory did not detect volatile or semi-volatile organic compounds in this sample, and all metals were within background ranges for soils in the San Francisco Bay area as referenced by Shacklette and Boerngen, 1984.

5.0 REMEDIAL PLAN

Based on data provided by Geomatrix, Kaiser has chosen to excavate soil affected by mineral spirits at concentrations above the limit of detection (10 ppm) on the site. Based on tests completed to-date, the soil removed can be disposed of directly at a Class II facility, or aerated followed by disposal at a Class III facility. Current regulations allow soil affected by mineral spirits with concentrations less than 1,000 ppm to be disposed as designated waste (Class II). Excavation is proposed in two stages to coordinate soil removal and building construction activities currently in progress. The proposed Phase I excavation area located behind the mechanical building is shown in Figure 2 and ranges in depth from four to seven feet. The estimated volume of soil to be removed in this area is 100 cubic yards. Figure 5 shows the area in cross-section. Phase I is estimated to begin within one month.

The Phase II excavation area is located on the hillside and under the mechanical building, and is scheduled to begin within 10 months. Affected soil below the hillside ranges in depth from approximately 30 feet at the top of the slope to 17 feet at the base of the slope. The soil proposed for removal is shown in cross-section on Figure 4, and the volume of soil is approximately 500 to 600 cubic yards. Affected soil below the mechanical building ranges in

depth from the surface to approximately 18 feet, and is shown in cross-section on Figure 3. The estimated yardage of soil to be removed in this area is 120 to 190 cubic yards.

The effect of the mineral spirits on groundwater should also be further evaluated. Samples of soil collected below groundwater level have not detected mineral spirits above 10 ppm it is anticipated that this evaluation will require the installation of monitoring well network, expected to consist of three to four wells. Optimum well locations have not yet been identified. Alameda County Health Department will be advised of the selected locations for approval purposes, prior to installation. We anticipate that the wells would be installed within the same time period as excavation activities.

6.0 REFERENCES

Shacklette and Boerngen, 1984, Element Concentrations in Soils and Other Surficial Materials of the Conterminous United States, U.S. Geological Survey Professional Paper 1270.

GEOMATRIX

TABLE 1

ANALYTICAL RESULTS OF SOIL ASSESSMENT - MINERAL SPIRITS[1]
KAISER HOSPITAL
Oakland, California

Sampling Date	Boring No.	Sample Depth	Concentrations in mg/kg (ppm) Mineral Spirits	Benzene	Toluene	Xylene	Ethyl-benzene
Excavation Near Mechanical Building:							
2/12/90	E-1(floor)	4.5	<10	<0.3	<0.3	<0.3	<0.3
2/12/90	E-2(wall)	3.5	<10	<0.3	<0.3	<0.3	<0.3
2/12/90	E-3(wall)	3.5	<10	<0.3	<0.3	<0.3	<0.3
2/12/90	E-4(wall)	3.5	<10	<0.3	<0.3	<0.3	<0.3
2/12/90	E-5(wall)	4.0	<10	<0.3	<0.3	<0.3	<0.3
4/25/90	E-6(floor)	13.0	<10	<0.3	<0.3	<0.3	<0.3
Borings in Mechanical Building:							
2/27/90	MB-1	18.5	<10	<0.3	<0.3	<0.3	<0.3
2/28/90	MB-2	10.0	<10	<0.3	<0.3	<0.3	<0.3
		15.0	Held				
		18.0	<10	<0.3	<0.3	<0.3	<0.3
2/28/90	MB-3	10.0	<10	<0.3	<0.3	<0.3	<0.3
2/28/90	MB-4	10.0	<10	<0.3	<0.3	<0.3	<0.3
2/28/90	MB-5[2]	--	--	--	--	--	--
3/2/90	MB-6	8.5	<10	<0.3	<0.3	<0.3	<0.3
		15.0	<10	<0.3	<0.3	<0.3	<0.3
Borings Behind Mechanical Building:							
2/27/90	B-8	15.0	<10	<0.3	<0.3	<0.3	<0.3
2/27/90	B-9	15.0	<10	<0.3	<0.3	<0.3	<0.3
2/27/90	B-10	15.0	<10	<0.3	<0.3	<0.3	<0.3
2/27/90	B-11	15.0	<10	<0.3	<0.3	<0.3	<0.3
3/1/90	B-12	5.0	34	0.6	0.6	1.4	0.6
		15.0	Held				

CONTR\1459-DF.TBL

TABLE 1 (concluded)

GEOMATRIX

ANALYTICAL RESULTS OF SOIL ASSESSMENT - MINERAL SPIRITS

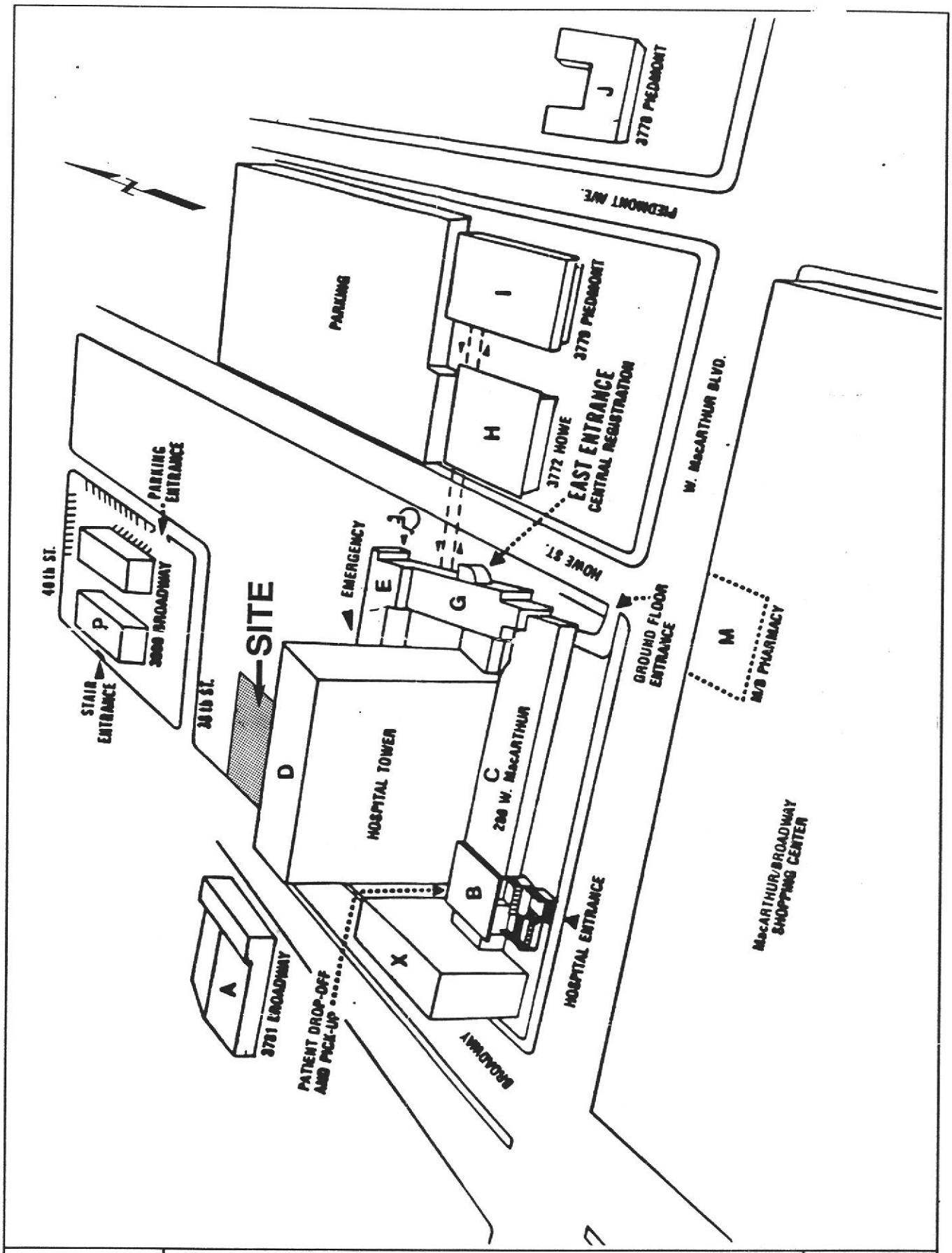
Sampling Date	Boring No.	Sample Depth	Concentrations in mg/kg (ppm) Mineral Spirits	Benzene	Toluene	Xylene	Ethyl-benzene
Borings Behind Mechanical Building:							
3/1/90	B-13	5.0	<10	<0.3	<0.3	<0.3	<0.3
		15.0	Held				
3/1/90	B-14	6.5	<10	<0.3	<0.3	<0.3	<0.3
3/1/90	B-15	13.5	Held				
		17.5	<10	<0.3	<0.3	<0.3	<0.3
3/1/90	B-16	5.5	<10	<0.3	<0.3	<0.3	<0.3
3/1/90	B-17	5.5	<10	<0.3	<0.3	<0.3	<0.3
3/1/90	B-18	6.0	Held				
3/1/90	B-19	5.5	<10	<0.3	<0.3	<0.3	<0.3
Borings on Hillside:							
3/12/90	B-20	10.5	<10	<0.3	<0.3	<0.3	<0.3
		25.5	Held				
3/12/90	B-21	2.0	33	<0.3	<0.3	<0.3	<0.3
		14.0	<10	<0.3	<0.3	<0.3	<0.3
3/12/90	B-22	6.0	<10	<0.3	<0.3	<0.3	<0.3
3/13/90		16.0	Held				
3/13/90	B-23	6.0	<10	<0.3	<0.3	<0.3	<0.3
3/13/24	B-24	6.0[3]	<10/<10	<0.3	<0.3	<0.3/0.4	<0.3
		31.0	<10	<0.3	<0.3	<0.3	<0.3
3/15/90	B-25	10.5	<10	<0.3	<0.3	<0.3	<0.3
3/15/90	B-26	6.0	<10	<0.3	<0.3	<0.3	<0.3
		23.5	<10	<0.3	<0.3	<0.3	<0.3

NOTES:

1 All chemical analysis performed by BC Analytical of Emeryville, California by modified EPA Method 8015/8020 for mineral spirits, benzene, toluene, xylene, and ethylbenzene.

2 Borings M-5, and B-27 through B-32 - Soil samples read with PID only.

3 This sample also analyzed by EPA Methods 8240 and 8270 by BC Analytical with no compounds detected, and for the 17 Title 26 metals by EPA Methods 6010, 7060, 7471, and 7740 with no compounds detected above background levels.

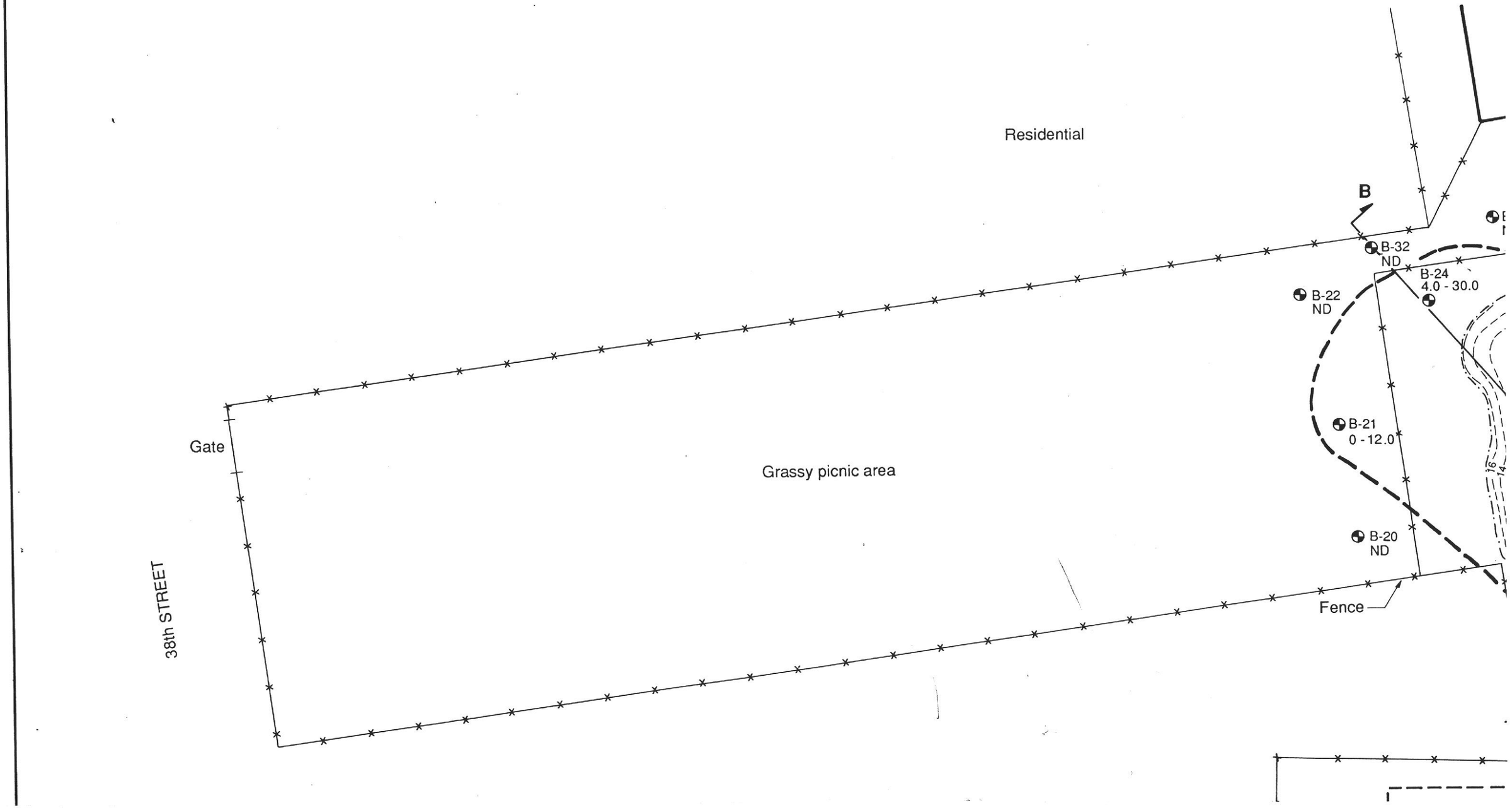


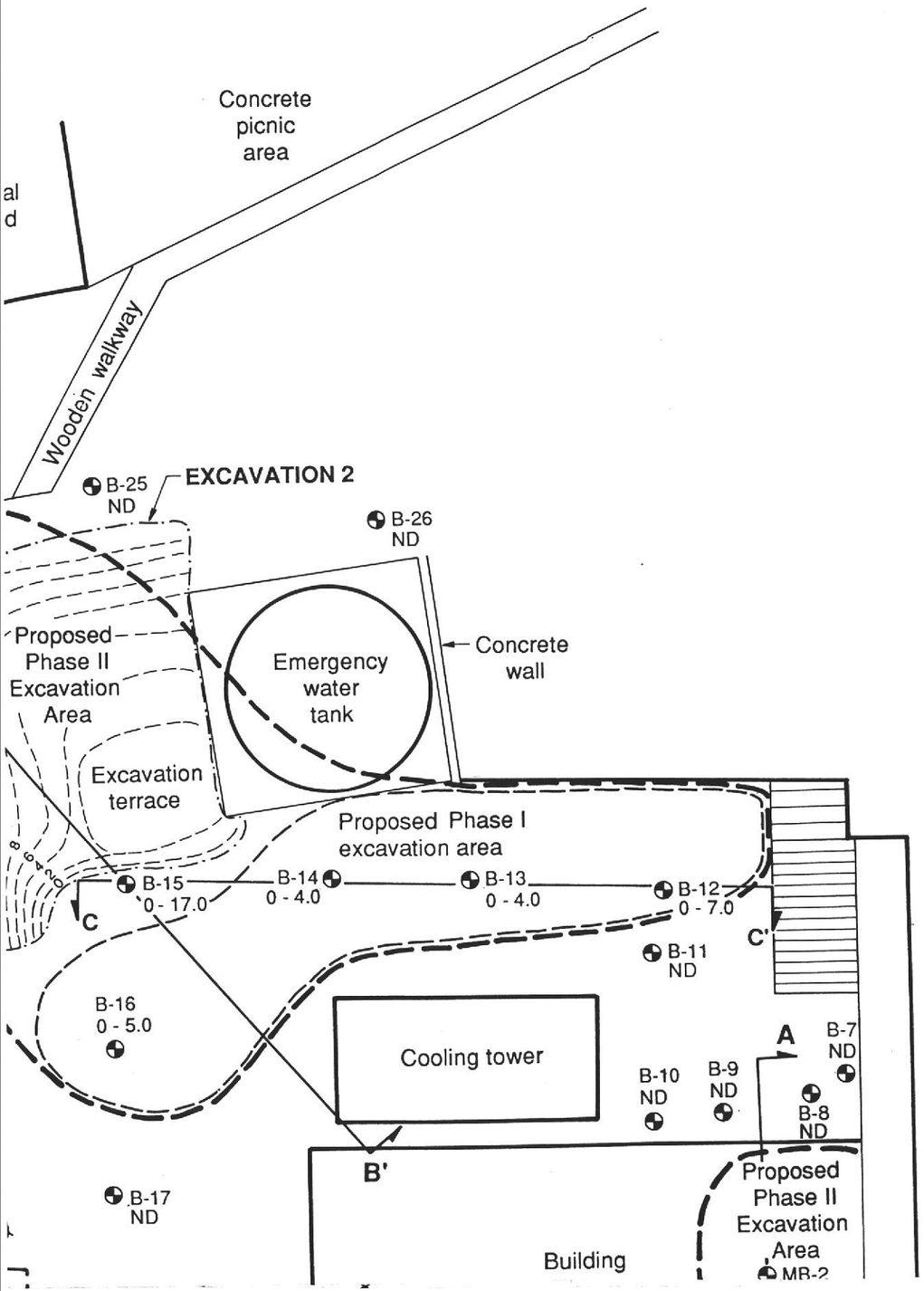
GEOMATRIX

SITE LOCATION
Kaiser Hospital
Oakland, California

Figure
1

Project No.
1459E


Residential
B
B-32
ND
B-24
4.0 - 30.0
B-22
ND
B-21
0 - 12.0
B-20
ND
Gate
Grassy picnic area
38th STREET
Fence
16
14

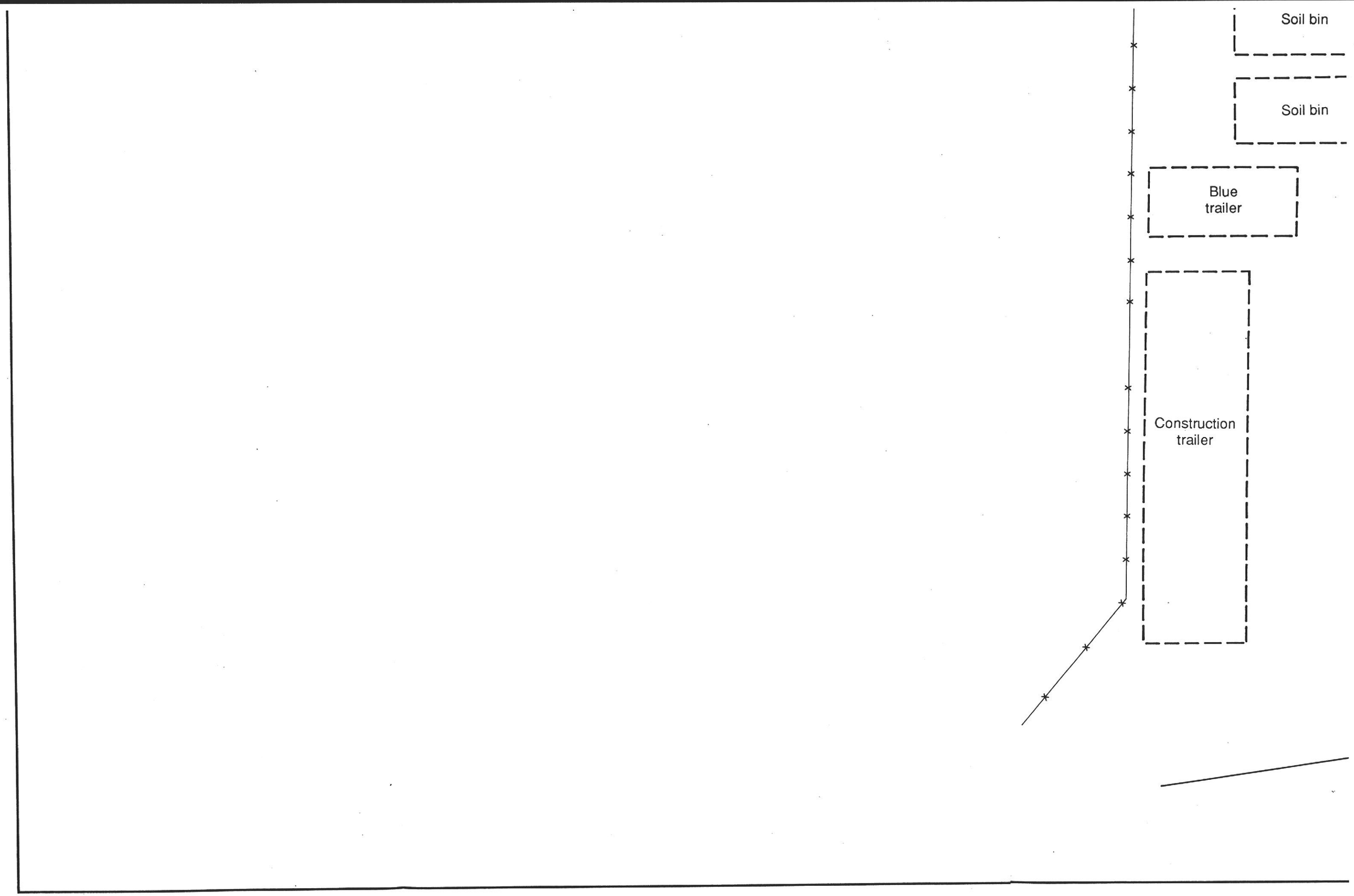


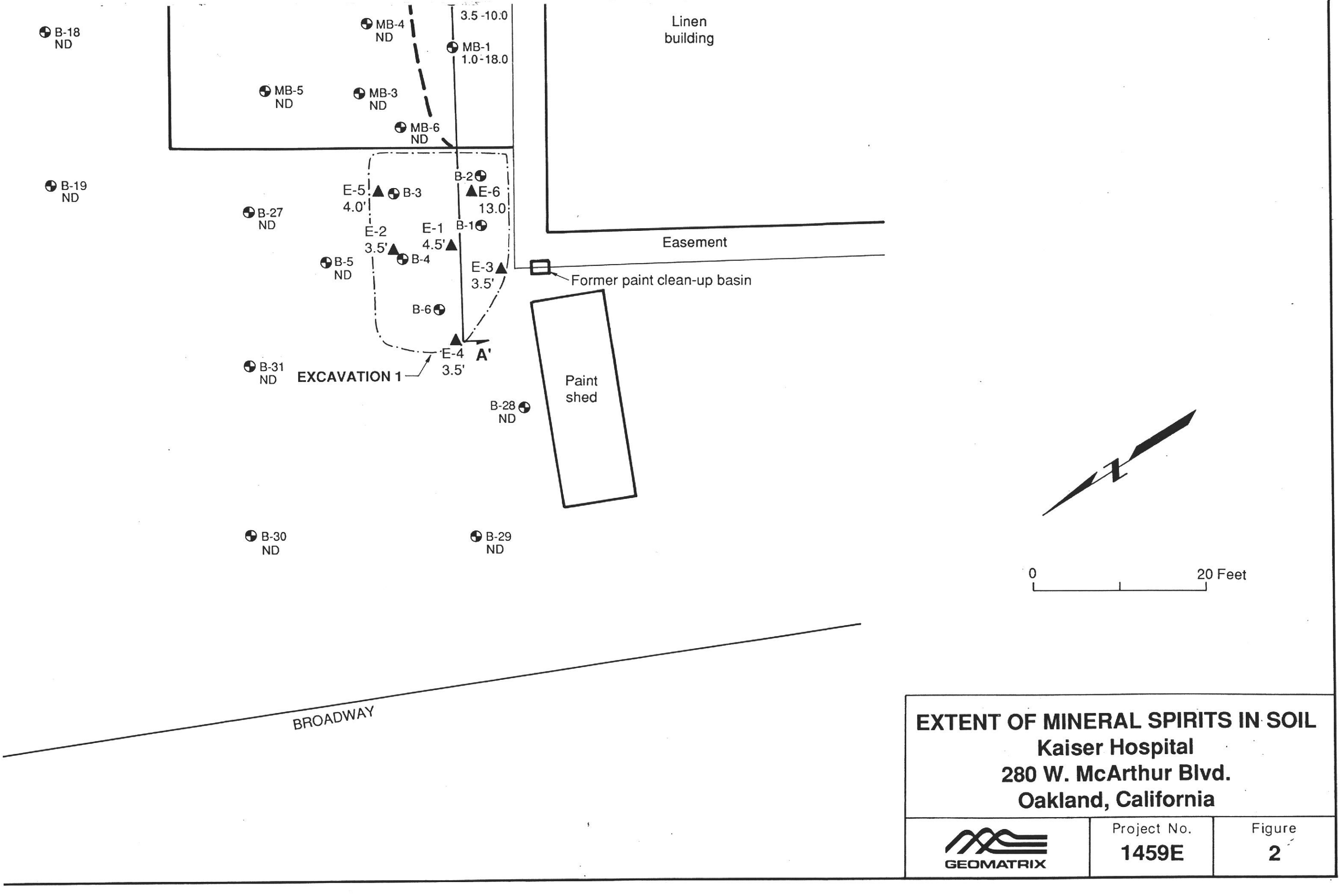
EXPLANATION

— — —	Approximate extent of area with detectable mineral spirits in the soil (proposed excavation area)
B-12 ◓ 0 - 7.0	Soil boring and depth range of soil with detectable mineral spirits
—·—·—·—	Extent of completed excavation
– – – – – –	Approximate lines of equal elevation, contour interval = 2 feet
ND	Not detected
E-1 ▲ 4.5'	Excavation soil sample and depth of acquistion

Notes

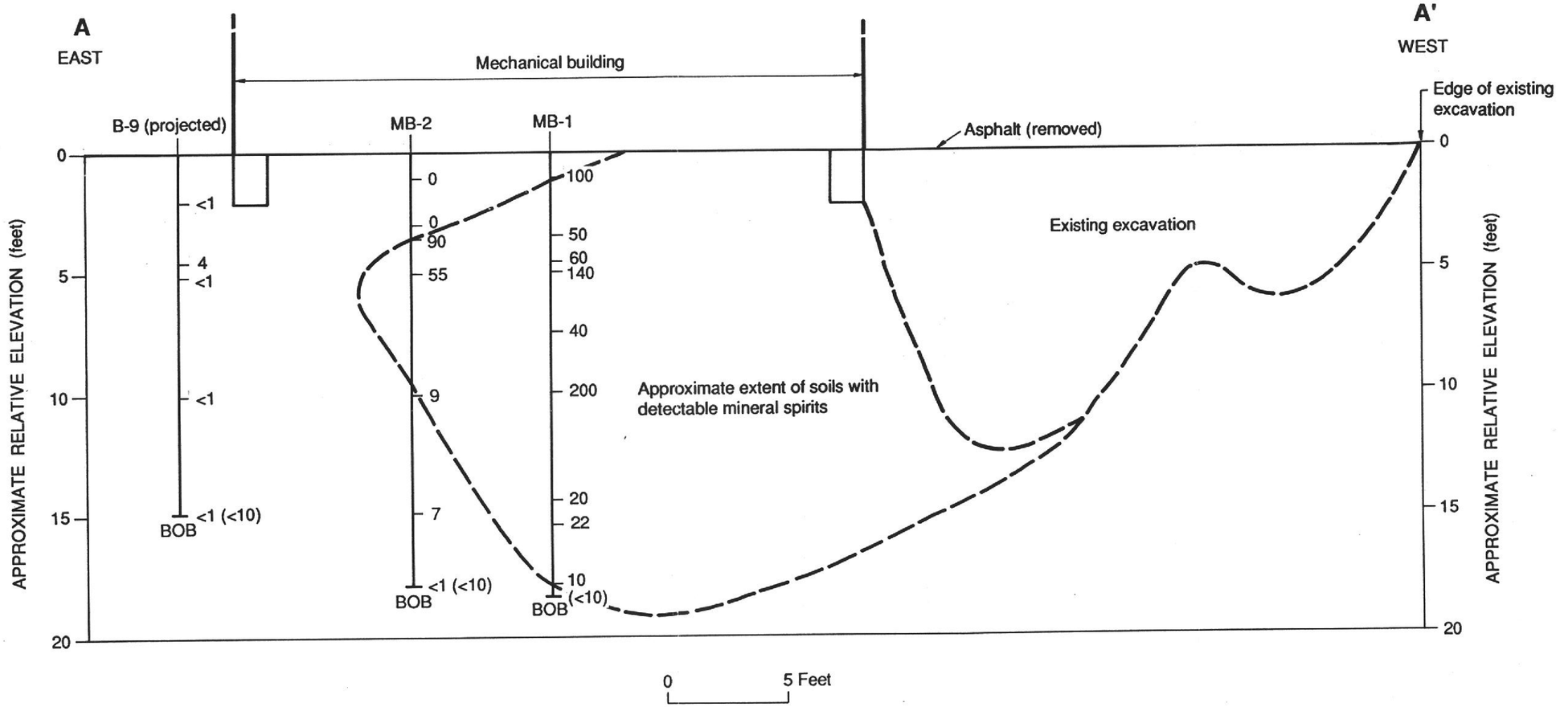
1. Cross section lines show extent of mineral spirits in soil (see following figures).
2. All soil borings are approximate.
3. Base map source: Oakland Medical Enter, Central Utility Plant, Existing Topography sheet, CI, 8/17/89. Additions approximate.


Soil bin
Soil bin
Blue
trailer
Construction
trailer



EXTENT OF MINERAL SPIRITS IN SOIL
Kaiser Hospital
280 W. McArthur Blvd.
Oakland, California

GEOMATRIX	Project No. 1459E	Figure 2



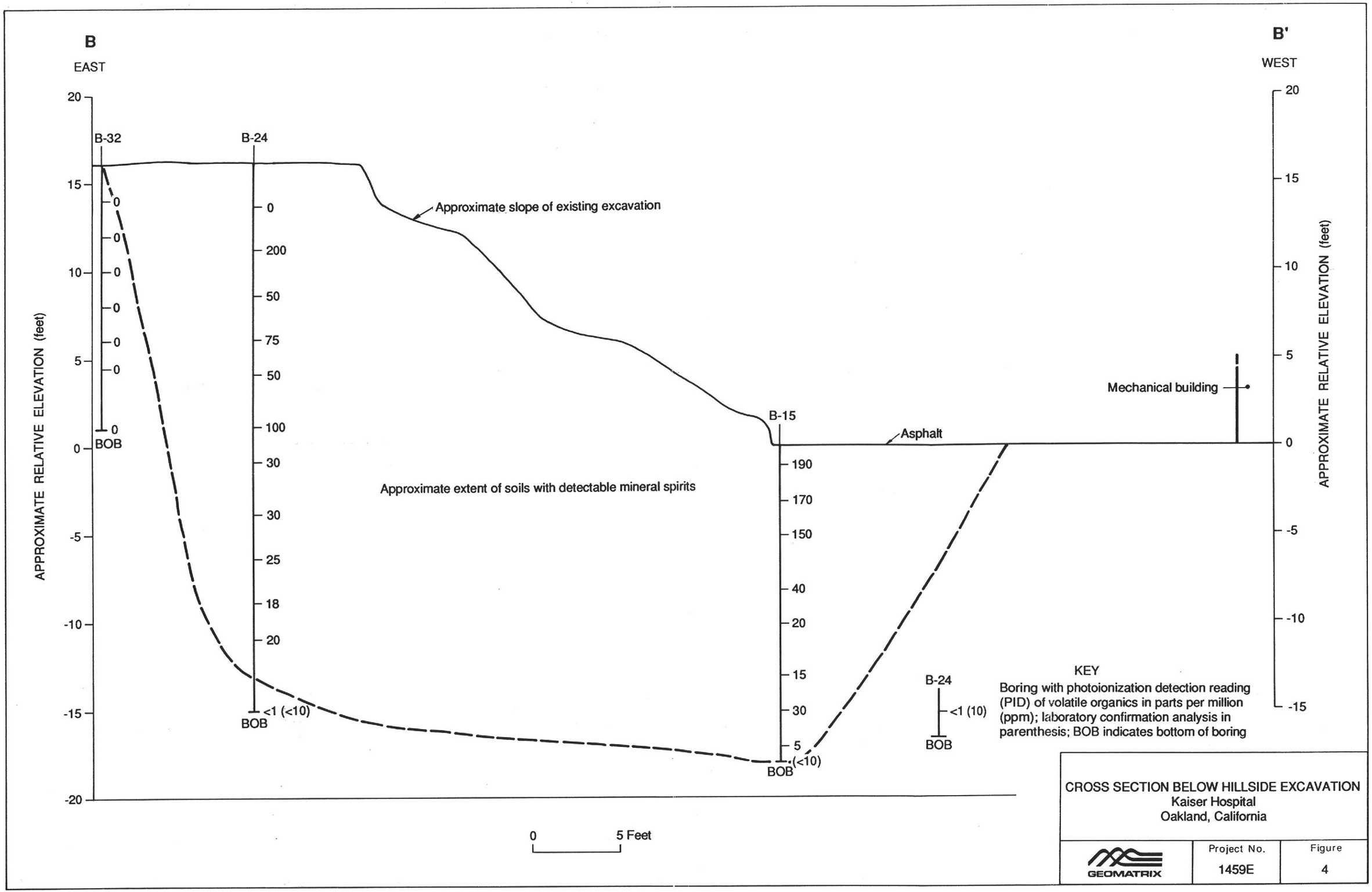
KEY

MB-1
<1 (10)
BOB

Boring with photoionization detection reading (PID) of volatile organics in parts per million (ppm); laboratory confirmation analysis in parenthesis; BOB indicates bottom of boring

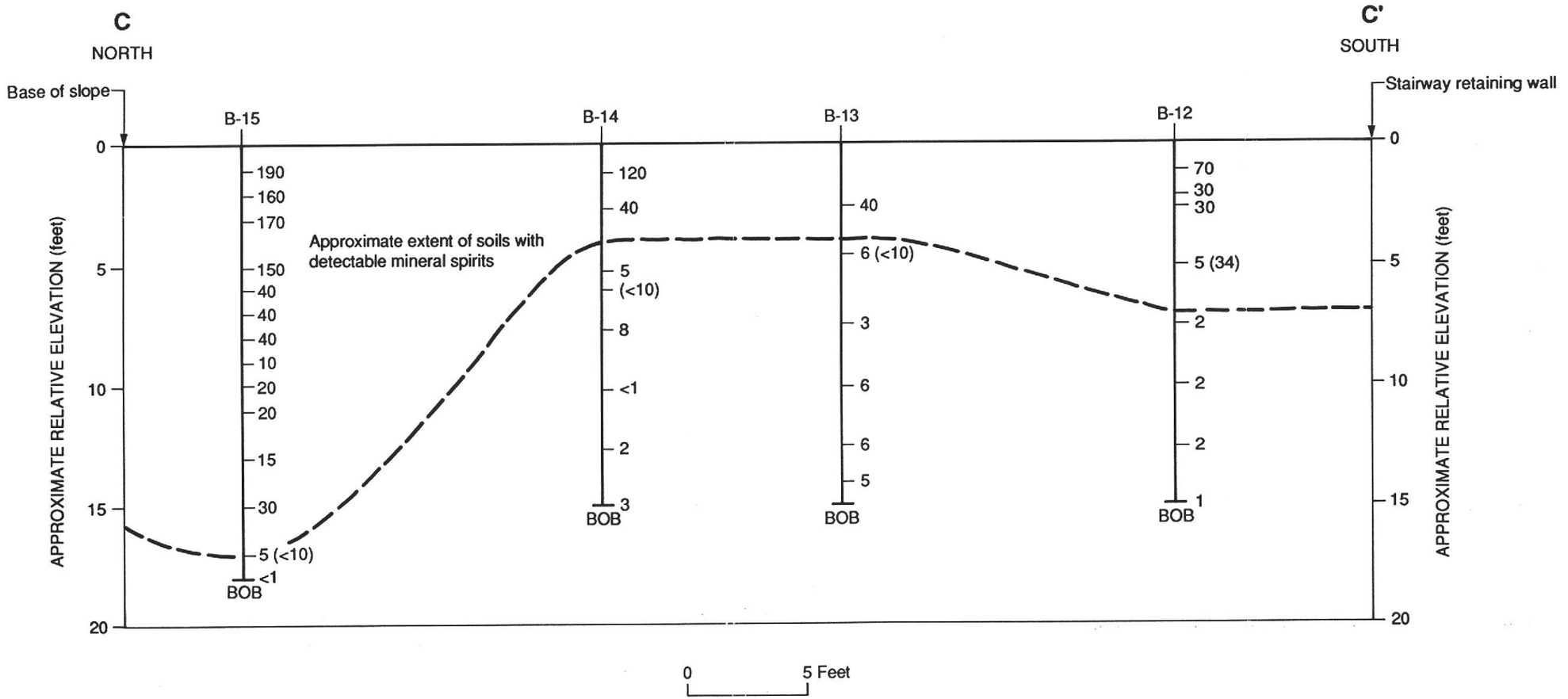
CROSS SECTION BELOW MECHANICAL BUILDING
Kaiser Hospital
Oakland, California

GEOMATRIX	Project No. 1459E	Figure 3



CROSS SECTION BELOW HILLSIDE EXCAVATION
Kaiser Hospital
Oakland, California

GEOMATRIX	Project No.	Figure
	1459E	4



KEY

B-13
6 (<10)
BOB

Boring with photoionization detection reading (PID) of volatile organics in parts per million (ppm); laboratory confirmation analysis in parenthesis; BOB indicates bottom of boring

CROSS SECTION BEHIND MECHANICAL BUILDING
Kaiser Hospital
Oakland, California

GEOMATRIX

Project No.	Figure
1459E	5

PROJECT: KAISER Oakland, California	**Log of Boring No. MB-1**
BORING LOCATION Inside Mechanical building	ELEVATION AND DATUM
DRILLING CONTRACTOR None	DATE STARTED 2/27/90 / DATE FINISHED 2/27/90
DRILLING METHOD Hand auger	TOTAL DEPTH 18.5' / MEASURING POINT
DRILLING EQUIPMENT Hand auger	DEPTH TO WATER: FIRST 18.0, COMPL. 18.2, 24 HRS. 16.0
SAMPLING METHOD Direct from auger	LOGGED BY C.D. Young
HAMMER WEIGHT --- / DROP ---	RESPONSIBLE PROFESSIONAL J.D. Gallinatti / REG. NO. CEG 1335

DEPTH (feet)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/Foot	DESCRIPTION NAME (USCS Symbol): color, moist, % by wt., plast., density, structure, cementation, react. w/HCl, geo. inter. Surface Elevation:	PID Results (ppm)	Analytical Results For Mineral Spirits (ppm)
0				3" asphalt CLAY Brown	<1	
1				CLAYEY SAND (SC) Brown to blue-green, dry, medium sand, some clay	100	
2						
3						
4					50	
5					60 140	
6						
7				SAND (SP) Brown (some blue-green color to 14 feet), dry, fine sand, trace clay	40	
8						
9						
10					200	
11						
12						
13						
14						

B-1-89/Modified

PROJECT: KAISER
Oakland, California

Log of Boring No. MB-1 cont'd.

DEPTH (feet)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/Foot	DESCRIPTION (NAME (USCS Symbol): color, moist, % by wt., plast., density, structure, cementation, react. w/HCl, geo. inter.)	PID Results (ppm)	Analytical Results For Mineral Spirits (ppm)
15					20	
					22	
16				Very moist		
17						
18	MB-1-18.5	■		Wet	10	<10
				Bottom of boring 18.5 feet		
19						
20						
21						
22						
23						
24						
25						
26						
27						
28						
29						
30						
31						

B-2-89/Modified

PROJECT: KAISER Oakland, California				**Log of Boring No. MB-2**
BORING LOCATION Inside Mechanical building			ELEVATION AND DATUM	
DRILLING CONTRACTOR None			DATE STARTED 2/27/90	DATE FINISHED 2/28/90
DRILLING METHOD Hand auger			TOTAL DEPTH 18.0'	MEASURING POINT
DRILLING EQUIPMENT Hand auger			DEPTH TO WATER: FIRST 17.5	COMPL. ---- / 24 HRS. ----
SAMPLING METHOD Direct from auger			LOGGED BY C.D. Young	
HAMMER WEIGHT ----	DROP ----		RESPONSIBLE PROFESSIONAL J.D. Gallinatti	REG. NO. CEG 1335

DEPTH (feet)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/Foot	DESCRIPTION NAME (USCS Symbol): color, moist, % by wt., plast., density, structure, cementation, react. w/HCl, geo. inter. Surface Elevation:	PID Results (ppm)	Analytical Results For Mineral Spirits (ppm)
				3" asphalt		
1				GRAVELLY SAND (SW) Medium brown, dry, medium sand, little coarse sand, little gravel to 1/2 inch diameter	<1	
2					<1	
3					<1	
4				Some blue-green color	90	
5					55	
6				SILTY SAND (SM) Light brown, dry, fine sand, some silt, little clay		
7						
8						
9						
10	MB-2-10.0				9	<10
11						
12						
13				CLAYEY SILT (ML) Light brown, moist, silt, little clay, low plasticity		
14						

B-1-89/Modified

Geomatrix Consultants	Project No. 1459C	Figure A-3

PROJECT: KAISER
Oakland, California

Log of Boring No. MB-2 cont'd.

DEPTH (feet)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/ Foot	DESCRIPTION: NAME (USCS Symbol): color, moist, % by wt., plast., density, structure, cementation, react. w/HCl, geo. inter.	PID Results (ppm)	Analytical Results For Mineral Spirits (ppm)
15	MB-2-15.0				7	Held
16						
17						
18	MB-2-18.0			Wet	<1	<10
19				Bottom of boring 18.0 feet		
20						
21						
22						
23						
24						
25						
26						
27						
28						
29						
30						
31						

B-2-89/Modified

PROJECT: KAISER Oakland, California			**Log of Boring No. MB-3**
BORING LOCATION Inside Mechanical building		ELEVATION AND DATUM	
DRILLING CONTRACTOR None		DATE STARTED 2/28/90	DATE FINISHED 2/28/90
DRILLING METHOD Hand auger		TOTAL DEPTH 16.5'	MEASURING POINT
DRILLING EQUIPMENT Hand auger		DEPTH TO WATER: FIRST ---	COMPL. --- / 24 HRS. ---
SAMPLING METHOD Direct from auger		LOGGED BY C.D. Young	
HAMMER WEIGHT ---	DROP ---	RESPONSIBLE PROFESSIONAL J.D. Gallinatti	REG. NO. CEG1335

DEPTH (feet)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/Foot	DESCRIPTION NAME (USCS Symbol): color, moist, % by wt., plast., density, structure, cementation, react. w/HCl, geo. inter. Surface Elevation:	PID Results (ppm)	Analytical Results For Mineral Spirits (ppm)
0				2" asphalt		
1				GRAVELLY SAND (SW) Medium brown, dry, medium sand, little coarse sand, little gravel to 1/2 inch diameter		
2						
3					<1	
4						
5					<1	
6						
7				SILTY SAND (SM) Light brown, dry, fine sand, some silt, little clay		
8						
9						
10	MB-3-10.0				<1	<10
11						
12				CLAYEY SILT (ML) Light brown, moist, silt, little clay, low plasticity		
13					21	
14						

B-1-89/Modified

PROJECT: KAISER
Oakland, California

Log of Boring No. MB-3 cont'd.

DEPTH (feet)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/Foot	DESCRIPTION: NAME (USCS Symbol): color, moist, % by wt., plast., density, structure, cementation, react. w/HCl, geo. inter.	PID Results (ppm)	Analytical Results For Mineral Spirits (ppm)
15						
16				Very moist		
				Bottom of boring 16.5 feet	<1	
17						
18						
19						
20						
21						
22						
23						
24						
25						
26						
27						
28						
29						
30						
31						

B-2-89/Modified

PROJECT: KAISER Oakland, California			**Log of Boring No. MB-4**	
BORING LOCATION Inside Mechanical building		ELEVATION AND DATUM		
DRILLING CONTRACTOR None		DATE STARTED 2/28/90	DATE FINISHED 2/28/90	
DRILLING METHOD Hand auger		TOTAL DEPTH 13.0'	MEASURING POINT	
DRILLING EQUIPMENT Hand auger		DEPTH TO WATER	FIRST 8.5	COMPL. 12.3 / 24 HRS. 9.0
SAMPLING METHOD Direct from auger		LOGGED BY C.D. Young		
HAMMER WEIGHT ---	DROP ---	RESPONSIBLE PROFESSIONAL J.D. Gallinatti		REG. NO. CEG1335

DEPTH (feet)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/Foot	DESCRIPTION NAME (USCS Symbol): color, moist, % by wt., plast., density, structure, cementation, react. w/HCl, geo. inter. Surface Elevation:	PID Results (ppm)	Analytical Results For Mineral Spirits (ppm)
0				2" asphalt, 3" baserock		
1				GRAVELLY SAND (SW) Medium brown, dry, medium sand, little coarse sand, little gravel to 1/2 inch diameter		
2					<1	
3						
4						
5					<1	
6						
7						
8				Wet		
9						
10	MB-4-10.0				<1	<10
11				CLAYEY SAND (SC) Brown, moist, medium sand, some clay		
12						
13					<1	
14				Bottom of boring 13.0 feet		

8-1-89/Modified

PROJECT: KAISER
Oakland, California

Log of Boring No. MB-5

BORING LOCATION Inside Mechanical building	ELEVATION AND DATUM		
DRILLING CONTRACTOR None	DATE STARTED 2/28/90	DATE FINISHED 2/28/90	
DRILLING METHOD Hand auger	TOTAL DEPTH 15.5'	MEASURING POINT	
DRILLING EQUIPMENT Hand auger	DEPTH TO WATER	FIRST ---	COMPL. --- / 24 HRS. ---
SAMPLING METHOD Direct from auger	LOGGED BY C.D. Young		
HAMMER WEIGHT --- / DROP ---	RESPONSIBLE PROFESSIONAL J.D. Gallinatti	REG. NO. CEG1335	

DEPTH (feet)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/Foot	DESCRIPTION (NAME (USCS Symbol): color, moist, % by wt., plast., density, structure, cementation, react. w/HCl, geo. inter.)	PID Results (ppm)	Analytical Results For Mineral Spirits (ppm)
				Surface Elevation:		
0				2" asphalt		
1				GRAVELLY SAND (SW) Medium brown, dry, medium sand, little coarse sand, little gravel to 1/2 inch diameter		
2						
3					<1	
4						
5					<1	
6						
7						
8						
9						
10				CLAYEY SAND (SC) Brown, moist, medium sand, some clay		
11						
12						
15						
15.5				Bottom of boring 15.5 feet	<1	
16						

B-1-89/Modified

Geomatrix Consultants	Project No. 1459C	Figure A-8

PROJECT: KAISER Oakland, California			**Log of Boring No. MB-6**
BORING LOCATION Inside Mechanical building		ELEVATION AND DATUM	
DRILLING CONTRACTOR None		DATE STARTED 2/28/90	DATE FINISHED 2/28/90
DRILLING METHOD Hand auger		TOTAL DEPTH 15.o'	MEASURING POINT
DRILLING EQUIPMENT Hand auger		DEPTH TO WATER: FIRST ---; COMPL. ---; 24 HRS. ---	
SAMPLING METHOD Direct from auger		LOGGED BY C.D. Young	
HAMMER WEIGHT ---	DROP ---	RESPONSIBLE PROFESSIONAL J.D. Gallinatti	REG. NO. CEG1335

DEPTH (feet)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/Foot	DESCRIPTION NAME (USCS Symbol): color, moist, % by wt., plast., density, structure, cementation, react. w/HCl, geo. inter.	PID Results (ppm)	Analytical Results For Mineral Spirits (ppm)
				Surface Elevation:		
				2" asphalt, 3" baserock		
1				CLAYEY SAND (SC) Brown, dry, medium sand, some clay	<1	
2					2	
3				Wet		
4						
5						
6					<1	
7						
8	MB-6-8.5				<1	<10
9						
10					<1	
13					<1 (12 ft)	
14				Moist	<1	
15	MB-6-15.0			Very moist Bottom of boring 15.0 feet	<1	<10
16						

B-1-89/Modified

Geomatrix Consultants	Project No. 1459C	Figure A-9

PROJECT: KAISER
Oakland, California

Log of Boring No. B-7

BORING LOCATION Behind Mechanical building	ELEVATION AND DATUM		
DRILLING CONTRACTOR Access Soil Drilling	DATE STARTED 2/27/90	DATE FINISHED 2/27/90	
DRILLING METHOD 3" diameter solid stem auger	TOTAL DEPTH 6.0'	MEASURING POINT	
DRILLING EQUIPMENT Minuteman	DEPTH TO WATER	FIRST ---	COMPL. --- / 24 HRS. ---
SAMPLING METHOD 2.5" OD modified California	LOGGED BY C.D. Young		
HAMMER WEIGHT 140 lbs. / DROP 30 inches	RESPONSIBLE PROFESSIONAL J.D. Gallinatti	REG. NO. CEG1335	

DEPTH (feet)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/Foot	DESCRIPTION NAME (USCS Symbol): color, moist, % by wt., plast., density, structure, cementation, react. w/HCl, geo. inter. Surface Elevation:	PID Results (ppm)	Analytical Results For Mineral Spirits (ppm)
0				3" asphalt		
1				SANDY CLAY (CH) Brown, moist, clay, little coarse to medium sand, high plasticity, soft		
2						
3						
4						
5					[redacted]	
6				Bottom of boring 6.0 feet - hit concrete footing to retaining wall		
7						
8						
9						
10						
11						
12						
13						
14						

8-1-89/Modified

PROJECT: KAISER
Oakland, California

Log of Boring No. B-8

BORING LOCATION Behind Mechanical building		ELEVATION AND DATUM		
DRILLING CONTRACTOR Access Soil Drilling		DATE STARTED 2/27/90	DATE FINISHED 2/27/90	
DRILLING METHOD 3" diameter solid stem auger		TOTAL DEPTH 15.0'	MEASURING POINT	
DRILLING EQUIPMENT Minuteman		DEPTH TO WATER	FIRST ---	COMPL. --- / 24 HRS. ---
SAMPLING METHOD 2.5" OD modified California		LOGGED BY C.D. Young		
HAMMER WEIGHT 140 lbs.	DROP 30 inches	RESPONSIBLE PROFESSIONAL J.D. Gallinatti		REG. NO. CEG1335

DEPTH (feet)	SAMPLES Sample No.	SAMPLES Sample	SAMPLES Blows/Foot	DESCRIPTION NAME (USCS Symbol): color, moist, % by wt., plast., density, structure, cementation, react. w/HCl, geo. inter. Surface Elevation:	PID Results (ppm)	Analytical Results For Mineral Spirits (ppm)
0				3" asphalt		
1				CLAY (CL) Dark brown, moist, clay, few medium sand, high plasticity, soft		
2				SAND (SP) Red-brown, moist, medium sand, little coarse sand, trace clay	<1	
3						
4				CLAYEY SAND (SC) Light brown, moist, fine sand, some clay		
5					<1	
6						
7						
8						
9						
10				SILTY CLAY (CL) Light brown, moist, clay, firm, low plasticity	<1	
11						
14						
15	B-8-15.0		120	Bottom of boring 15.0 feet	<1	<10
16						

B-1-89/Modified

Geomatrix Consultants | Project No. 1459C | Figure A-11

PROJECT: KAISER
Oakland, California

Log of Boring No. B-9

BORING LOCATION Behind Mechanical building	ELEVATION AND DATUM		
DRILLING CONTRACTOR Access Soil Drilling	DATE STARTED 2/27/90	DATE FINISHED 2/27/90	
DRILLING METHOD 3" diameter solid stem auger	TOTAL DEPTH 15.0'	MEASURING POINT	
DRILLING EQUIPMENT Minuteman	DEPTH TO WATER	FIRST ---	COMPL. --- / 24 HRS. ---
SAMPLING METHOD 2.5" OD modified California	LOGGED BY C.D. Young		
HAMMER WEIGHT 140 lbs. / DROP 30 inches	RESPONSIBLE PROFESSIONAL J.D. Gallinatti	REG. NO. CEG1335	

DEPTH (feet)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/Foot	DESCRIPTION NAME (USCS Symbol): color, moist, % by wt., plast., density, structure, cementation, react. w/HCl, geo. inter. Surface Elevation:	PID Results (ppm)	Analytical Results For Mineral Spirits (ppm)
0				3" asphalt		
1				CLAY (CH) Dark gray, moist, clay, little fine sand, high plasticity, soft		
2				CLAYEY SAND (SC) Red-brown, moist, medium to coarse sand, little gravel to 1/2 inch diameter, few clay	<1	
3						
4						
5					4 <1	
6						
7						
8						
9						
10				Wet, more sand	<1	
11				SANDY CLAY (CH) Light brown, very moist, clay, little sand, soft, high plasticity		
14	B-9-15.0					
15				Bottom of boring 15.0 feet	<1	<10
16						

B-1-89/Modified

Geomatrix Consultants	Project No. 1459C	Figure A-12

PROJECT: KAISER
Oakland, California

Log of Boring No. B-10

BORING LOCATION Behind Mechanical building	ELEVATION AND DATUM		
DRILLING CONTRACTOR Access Soil Drilling	DATE STARTED 2/27/90	DATE FINISHED 2/27/90	
DRILLING METHOD 3" diameter solid stem auger	TOTAL DEPTH 15.0'	MEASURING POINT	
DRILLING EQUIPMENT Minuteman	DEPTH TO WATER	FIRST ---	COMPL. --- / 24 HRS. ---
SAMPLING METHOD 2.5" OD modified California	LOGGED BY C.D. Young		
HAMMER WEIGHT 140 lbs. / DROP 30 inches	RESPONSIBLE PROFESSIONAL J.D. Gallinatti	REG. NO. CEG1335	

DEPTH (feet)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/Foot	DESCRIPTION NAME (USCS Symbol): color, moist, % by wt., plast., density, structure, cementation, react. w/HCl, geo. inter. Surface Elevation:	PID Results (ppm)	Analytical Results For Mineral Spirits (ppm)
0				3" asphalt		
1				CLAY (CH) Dark gray, moist, clay, little fine sand, high plasticity, soft		
2				CLAYEY SAND (SC) Red-brown, moist, medium to coarse sand, little gravel to 1/2 inch diameter, few clay		
3						
4						
5					<1	
6						
7						
8						
9						
10				Wet	<1	
11				SANDY CLAY (CH) Light brown, very moist, clay, little sand, soft, high plasticity		
14						
15	B-10 -15.0		112	Bottom of boring 15.0 feet	<1	<10
16						

B-1-89/Modified

PROJECT: KAISER
Oakland, California

Log of Boring No. B-11

BORING LOCATION Behind Mechanical building	ELEVATION AND DATUM		
DRILLING CONTRACTOR Access Soil Drilling	DATE STARTED 2/27/90	DATE FINISHED 2/27/90	
DRILLING METHOD 3" diameter solid stem auger	TOTAL DEPTH 15.0'	MEASURING POINT	
DRILLING EQUIPMENT Minuteman	DEPTH TO WATER	FIRST ---	COMPL. --- / 24 HRS. ---
SAMPLING METHOD 2.5" OD modified California	LOGGED BY C.D. Young		
HAMMER WEIGHT 140 lbs. / DROP 30 inches	RESPONSIBLE PROFESSIONAL J.D. Gallinatti	REG. NO. CEG1335	

DEPTH (feet)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/Foot	DESCRIPTION (NAME (USCS Symbol): color, moist, % by wt., plast., density, structure, cementation, react. w/HCl, geo. inter.)	PID Results (ppm)	Analytical Results For Mineral Spirits (ppm)
				Surface Elevation:		
0				3" asphalt		
1				CLAYEY SAND (SC) Dark brown, moist, medium sand, some clay		
2					<1	
3				SAND (SP) (FILL) Light brown, moist, medium sand		
4				SAND (SP) Brown, moist, medium sand, few coarse sand, trace gravel, trace clay	<1	
5					<1	
6						
7						
8						
9						
10				SANDY CLAY (CH) Light brown, moist, clay, little sand, soft, high plasticity	<1	
13				SAND (SP) Light brown, moist, fine sand		
14	B-10 -15.0					
15				Bottom of boring 15.0 feet	<1	<10
16						

B-1-89/Modified

Geomatrix Consultants | Project No. 1459C | Figure A-14

PROJECT: KAISER Oakland, California		**Log of Boring No. B-12**		
BORING LOCATION Near storm drain basin behind Mechanical building		ELEVATION AND DATUM		
DRILLING CONTRACTOR Aqua Science		DATE STARTED 3/1/90	DATE FINISHED 3/1/90	
DRILLING METHOD Solid stem auger, 6" OD		TOTAL DEPTH 15'	MEASURING POINT	
DRILLING EQUIPMENT B-57		DEPTH TO WATER: FIRST ---; COMPL. ---; 24 HRS. ---		
SAMPLING METHOD 2 1/2" OD California modified		LOGGED BY C.D. Young		
HAMMER WEIGHT 140 lbs.	DROP 30"	RESPONSIBLE PROFESSIONAL J.D. Gallinatti	REG. NO. CEG1335	

DEPTH (feet)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/Foot	DESCRIPTION NAME (USCS Symbol): color, moist, % by wt., plast., density, structure, cementation, react. w/HCl, geo. inter. Surface Elevation:	PID Results (ppm)	Analytical Results For Mineral Spirits (ppm)
1				Asphalt 3" CLAYEY SAND Blue-green, moist, medium sand, some clay, strong HC odor		
2				GRAVELLY SAND (SW) Brown, dry, medium and coarse sand, little angular gravel, trace clay	30	
3					30	
4				No hydrocarbon odor		
5	B-12-5.0				5	34
6						
7				CLAYEY SAND (SC) Brown, moist, medium and coarse sand, some clay		
8					2	
9						
10					2	
13					2	
14				CLAYEY SILT (ML) Light brown, moist, silt, some clay, low plasticity, soft		
15	B-12-15.0		20	Bottom of boring 15 feet	1	Held
16						

B-1-89/Modified

Geomatrix Consultants	Project No. 1459C	Figure A-15

PROJECT: KAISER Oakland, California		**Log of Boring No. B-13**	
BORING LOCATION Behind cooling tower		ELEVATION AND DATUM	
DRILLING CONTRACTOR Aqua Science		DATE STARTED 3/1/90	DATE FINISHED 3/1/90
DRILLING METHOD Solid stem auger, 6" OD		TOTAL DEPTH 15'	MEASURING POINT
DRILLING EQUIPMENT B-57		DEPTH TO WATER: FIRST ---	COMPL. --- / 24 HRS. ---
SAMPLING METHOD 2 1/2" OD California modified		LOGGED BY C.D. Young	
HAMMER WEIGHT 140 lbs.	DROP 30"	RESPONSIBLE PROFESSIONAL J.D. Gallinatti	REG. NO. CEG1335

DEPTH (feet)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/Foot	DESCRIPTION NAME (USCS Symbol): color, moist, % by wt., plast., density, structure, cementation, react. w/HCl, geo. inter. Surface Elevation:	PID Results (ppm)	Analytical Results For Mineral Spirits (ppm)
1				(no asphalt) GRAVELLY SAND (SW) Brown, moist, medium and coarse sand, little angular gravel, trace clay, hydrocarbon odor		
2					40	
3						
4						
5	B-13-5.0				6	<10
6						
7						
8					3	
9				CLAYEY SAND (SC) Brown, moist, medium and coarse sand, some clay		
10					6	
13					6	
14				CLAYEY SILT (ML) Light brown, moist, silt, some clay, low plasticity, soft	5	
15	B-13-15.0		39	Bottom of boring 15 feet		Held
16						

B-1-89/Modified

Geomatrix Consultants	Project No. 1459C	Figure A-16

PROJECT: KAISER Oakland, California		**Log of Boring No. B-14**	
BORING LOCATION Corner of cooling tower		ELEVATION AND DATUM	
DRILLING CONTRACTOR Aqua Science		DATE STARTED 3/1/90	DATE FINISHED 3/1/90
DRILLING METHOD Solid stem auger, 6" OD		TOTAL DEPTH 15'	MEASURING POINT
DRILLING EQUIPMENT B-57		DEPTH TO WATER / FIRST --- / COMPL. --- / 24 HRS. ---	
SAMPLING METHOD 2 1/2" OD California modified		LOGGED BY C.D. Young	
HAMMER WEIGHT 140 lbs.	DROP 30"	RESPONSIBLE PROFESSIONAL J.D. Gallinatti	REG. NO. CEG1335

DEPTH (feet)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/Foot	DESCRIPTION NAME (USCS Symbol): color, moist, % by wt., plast., density, structure, cementation, react. w/HCl, geo. inter. Surface Elevation:	PID Results (ppm)	Analytical Results For Mineral Spirits (ppm)
1				(No asphalt) SANDY CLAY Dark blue-gray, moist, clay, little medium sand, medium plasticity, soft	120	
2				GRAVELLY SAND (SW) Brown, moist, medium and coarse sand, little angular gravel, trace clay, hydrocarbon odor	40	
3						
4						
5					5	
6	B-14-6.5		37			<10
7						
8					8	
8				CLAYEY SAND (SC) Brown, moist, medium and coarse sand, some clay		
9						
12					<10 (10 ft)	
12				CLAYEY SILT (ML) Light brown, moist, silt, some clay, low plasticity, soft	5	
13				SILTY SAND (SM) Light brown, moist, medium sand, some silt		
14						
15					3	
15				Bottom of boring 15 feet		
16						

B-1-89/Modified

Geomatrix Consultants	Project No. 1459C	Figure A-17

PROJECT: KAISER Oakland, California		**Log of Boring No. B-15**		
BORING LOCATION At base of excavated slope near cooling tower		ELEVATION AND DATUM		
DRILLING CONTRACTOR Aqua Science		DATE STARTED 3/1/90	DATE FINISHED 3/1/90	
DRILLING METHOD Solid stem auger, 6" OD		TOTAL DEPTH 18'	MEASURING POINT	
DRILLING EQUIPMENT B-57		DEPTH TO WATER	FIRST ---	COMPL. --- / 24 HRS. ---
SAMPLING METHOD 2 1/2" OD California modified		LOGGED BY C.D. Young		
HAMMER WEIGHT 140 lbs.	DROP 30"	RESPONSIBLE PROFESSIONAL J.D. Gallinatti		REG. NO. CEG1335

DEPTH (feet)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/Foot	DESCRIPTION NAME (USCS Symbol): color, moist, % by wt., plast., density, structure, cementation, react. w/HCl, geo. inter. Surface Elevation:	PID Results (ppm)	Analytical Results For Mineral Spirits (ppm)
1				No asphalt SANDY CLAY (CL) Dark brown with slight blue tinge, moist, clay, little medium sand, medium plasticity, soft, strong HC odor	190	
2					160	
3				GRAVELLY SAND (SW) Brown, dry, medium and coarse sand, little angular gravel, trace clay	170	
4						
5					150	
6					40	
7				Trace gravel	40	
8					40	
9					10	
10					20	
11					20	
12						
13	B-15-13.5			CLAYEY SAND (SC)		Held
14						

B-1-89/Modified

Geomatrix Consultants	Project No. 1459C	Figure A-18

PROJECT: KAISER
Oakland, California

Log of Boring No. B-15 cont'd.

DEPTH (feet)	SAMPLES Sample No.	SAMPLES Sample	SAMPLES Blows/ Foot	DESCRIPTION NAME (USCS Symbol): color, moist, % by wt., plast., density, structure, cementation, react. w/HCl, geo. inter.	PID Results (ppm)	Analytical Results For Mineral Spirits (ppm)
15				CLAYEY SAND (SC) Brown, moist, medium and coarse sand, some clay	30	
16						
17				ATD ▽	5	<10
			23	SAND Light brown, wet, medium and coarse sand, few gravel		
18				Bottom of boring 18.0 feet	<1	
19						
20						
21						
22						
23						
24						
25						
26						
27						
28						
29						
30						
31						

B-2-89/Modified

PROJECT: KAISER
Oakland, California

Log of Boring No. B-16

BORING LOCATION Approximately 15' from base of slope		ELEVATION AND DATUM	
DRILLING CONTRACTOR Aqua Science		DATE STARTED 3/1/90	DATE FINISHED 3/1/90
DRILLING METHOD Solid stem auger, 6" OD		TOTAL DEPTH 15'	MEASURING POINT
DRILLING EQUIPMENT B-57		DEPTH TO WATER / FIRST --- / COMPL --- / 24 HRS. ---	
SAMPLING METHOD 2 1/2" OD California modified		LOGGED BY C.D. Young	
HAMMER WEIGHT 140 lbs.	DROP 30"	RESPONSIBLE PROFESSIONAL J.D. Gallinatti	REG. NO. CEG1335

DEPTH (feet)	SAMPLES Sample No.	SAMPLES Sample	SAMPLES Blows/Foot	DESCRIPTION NAME (USCS Symbol): color, moist, % by wt., plast., density, structure, cementation, react. w/HCl, geo. inter.	PID Results (ppm)	Analytical Results For Mineral Spirits (ppm)
				Surface Elevation:		
1				(No asphalt) CLAYEY SAND (SC) (FILL) Dark brown, dry, medium sand, some clay	150	
2				SAND (SP) Brown, dry, medium and coarse sand, few angular gravel, trace clay	90	
3					25	
4					30	
5	B-16-5.5		27		5	<10
6						
7					6	
8				No gravel		
9						
12					7 (10 ft)	
13				Few clay	2	
14				CLAYEY SAND (SC) Brown, moist, medium and coarse sand, some clay		
15					<1	
16				Bottom of boring 15 feet		

B-1-89/Modified

Geomatrix Consultants	Project No. 1459C	Figure A-20

PROJECT: KAISER Oakland, California	**Log of Boring No. B-17**
BORING LOCATION Approximately 25' from base of slope	ELEVATION AND DATUM
DRILLING CONTRACTOR Aqua Science	DATE STARTED 3/1/90 / DATE FINISHED 3/1/90
DRILLING METHOD Solid stem auger, 6" OD	TOTAL DEPTH 15' / MEASURING POINT
DRILLING EQUIPMENT B-57	DEPTH TO WATER: FIRST ---, COMPL. ---, 24 HRS. ---
SAMPLING METHOD 2 1/2" OD California modified	LOGGED BY C.D. Young
HAMMER WEIGHT 140 lbs. / DROP 30"	RESPONSIBLE PROFESSIONAL J.D. Gallinatti / REG. NO. CEG1335

DEPTH (feet)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/Foot	DESCRIPTION NAME (USCS Symbol): color, moist, % by wt., plast., density, structure, cementation, react. w/HCl, geo. inter. Surface Elevation:	PID Results (ppm)	Analytical Results For Mineral Spirits (ppm)
0				3" asphalt CLAYEY SAND (SC) (FILL) Reddish brown, medium sand, dry, little clay, few chips brick		
1					1	
				SAND (SP) Brown, dry, medium and coarse sand, few angular gravel, trace clay		
2					2	
3					2	
4					<1	
5	B-17-5.5		23		<1	<10
6						
7				Few clay	2	
8						
9						
10					4 (10 ft)	
12					9	
13						
14						
15				Bottom of boring 15 feet	15	
16						

B-1-89/Modified

Geomatrix Consultants	Project No. 1459C	Figure A-21

PROJECT: KAISER Oakland, California		**Log of Boring No. B-18**	
BORING LOCATION 10' west of B-17		ELEVATION AND DATUM	
DRILLING CONTRACTOR Aqua Science		DATE STARTED 3/1/90	DATE FINISHED 3/1/90
DRILLING METHOD Solid stem auger, 6" OD		TOTAL DEPTH 15'	MEASURING POINT
DRILLING EQUIPMENT B-57		DEPTH TO WATER: FIRST ---	COMPL. --- / 24 HRS. ---
SAMPLING METHOD 2 1/2" OD California modified		LOGGED BY C.D. Young	
HAMMER WEIGHT 140 lbs.	DROP 30"	RESPONSIBLE PROFESSIONAL J.D. Gallinatti	REG. NO. CEG1335

DEPTH (feet)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/Foot	DESCRIPTION NAME (USCS Symbol): color, moist, % by wt., plast., density, structure, cementation, react. w/HCl, geo. inter. Surface Elevation:	PID Results (ppm)	Analytical Results For Mineral Spirits (ppm)
0				3" asphalt SANDY CLAY (CL) (FILL) Reddish brown, dry, clay, some sand, low plasticity, firm		
1				SAND (SP) Brown, dry, fine grading to medium sand	<1	
2					<1	
3				Medium sand	<1	
4					<1	
5			25		<1	
6	B-18-6.0					Held
7					1	
8						
9						
12					1 (10 ft)	
13					1	
14				Moist, few clay		
15				Bottom of boring 15 feet	<1	
16						

B-1-89/Modified

Geomatrix Consultants	Project No. 1459C	Figure A-22

PROJECT: KAISER
Oakland, California

Log of Boring No. B-19

BORING LOCATION 10' west of B-18	ELEVATION AND DATUM		
DRILLING CONTRACTOR Aqua Science	DATE STARTED 3/1/90	DATE FINISHED 3/1/90	
DRILLING METHOD Solid stem auger, 6" OD	TOTAL DEPTH 15'	MEASURING POINT	
DRILLING EQUIPMENT B-57	DEPTH TO WATER	FIRST ---	COMPL. --- / 24 HRS. ---
SAMPLING METHOD 2 1/2" OD California modified	LOGGED BY C.D. Young		
HAMMER WEIGHT 140 lbs. / DROP 30"	RESPONSIBLE PROFESSIONAL J.D. Gallinatti	REG. NO. CEG1335	

DEPTH (feet)	SAMPLES Sample No.	SAMPLES Sample	SAMPLES Blows/Foot	DESCRIPTION NAME (USCS Symbol): color, moist, % by wt., plast., density, structure, cementation, react. w/HCl, geo. inter. Surface Elevation:	PID Results (ppm)	Analytical Results For Mineral Spirits (ppm)
0				3" asphalt CLAYEY SAND (SC) (FILL)		
1				SAND (SP) Brown, dry, fine grading to medium sand	<1	
2					<1	
3					<1	
4					<1	
5	B-19-5.5		29		<1	<10
6						
7						
8				Few gravel	<1	
9						
10				Moist, trace clay		
11					<1 (12.5 ft)	
14						
15				Few clay	<1	
				Bottom of boring 15 feet		
16						

8-1-89/Modified

Geomatrix Consultants	Project No. 1459C	Figure A-23

PROJECT: KAISER Oakland, California		**Log of Boring No. B-20**	
BORING LOCATION On grass near excavation		ELEVATION AND DATUM	
DRILLING CONTRACTOR Access Drilling		DATE STARTED 3/12/90	DATE FINISHED 3/12/90
DRILLING METHOD Minuteman		TOTAL DEPTH 25.5'	MEASURING POINT
DRILLING EQUIPMENT 3" OD solid stem auger		DEPTH TO WATER: FIRST ---	COMPL. --- / 24 HRS. ---
SAMPLING METHOD 2 1/2" OD California modified		LOGGED BY C.D. Young	
HAMMER WEIGHT 70 lbs.	DROP 30"	RESPONSIBLE PROFESSIONAL J.D. Gallinatti	REG. NO. CEG1335

DEPTH (feet)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/Foot	DESCRIPTION NAME (USCS Symbol): color, moist, % by wt., plast., density, structure, cementation, react. w/HCl, geo. inter. Surface Elevation:	PID Results (ppm)	Analytical Results For Mineral Spirits (ppm)
1				SANDY CLAY (CL) Dark gray, moist, clay, little fine sand, medium plasticity, very soft, no odor	0	
2						
3						
4						
5				SANDY CLAY (CL) Dark brown, moist, clay, some fine sand, medium plasticity, soft, no odor	0	
6						
7						
8				Gradational contact		
9				CLAYEY SAND (SC) Light brown, dry, medium sand, some fine sand, little clay		
10	B-20-10.5		64		0	<10
11						
12						
13				SAND (SP) Light brown, dry, medium and fine sand, trace clay		
14						

B-1-89/Modified

Geomatrix Consultants	Project No. 1459E	Figure A-24

PROJECT: KAISER
Oakland, California

Log of Boring No. B-20 cont'd.

DEPTH (feet)	SAMPLES Sample No.	SAMPLES Sample	SAMPLES Blows/ Foot	DESCRIPTION NAME (USCS Symbol): color, moist, % by wt., plast., density, structure, cementation, react. w/HCl, geo. inter.	PID Results (ppm)	Analytical Results For Mineral Spirits (ppm)
15					0	
16				SANDY CLAY (CL) Light brown, dry, clay, some medium and fine sand, low plasticity, firm		
17						
18						
19						
20					0	
21						
22						
23				Silty		
24						
25	B-2-25.5		66		0	Held
				Bottom of boring 25.5 feet		
26						
27						
28						
29						
30						
31						

B-2-89/Modified

PROJECT: KAISER Oakland, California	**Log of Boring No. B-21**
BORING LOCATION On grass near excavation	ELEVATION AND DATUM
DRILLING CONTRACTOR Access Drilling	DATE STARTED 3/12/90 / DATE FINISHED 3/12/90
DRILLING METHOD Minuteman	TOTAL DEPTH 25' / MEASURING POINT
DRILLING EQUIPMENT 3" OD solid stem auger	DEPTH TO WATER / FIRST --- / COMPL. --- / 24 HRS. ---
SAMPLING METHOD 2 1/2" OD California modified	LOGGED BY C.D. Young
HAMMER WEIGHT 70 lbs. / DROP 30"	RESPONSIBLE PROFESSIONAL J.D. Gallinatti / REG. NO. CEG1335

DEPTH (feet)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/Foot	DESCRIPTION NAME (USCS Symbol): color, moist, % by wt., plast., density, structure, cementation, react. w/HCl, geo. inter.	PID Results (ppm)	Analytical Results For Mineral Spirits (ppm)
				Surface Elevation:		
1				SILTY CLAY (CL) Dark green-gray, moist, clay, some silt, medium plasticity, very soft		
2	B-21-2.0	■	18		18	33
3						
4				SILTY CLAY (CL) Light brown, dry, clay, some silt, low plasticity, firm		
5					20	
6						
7						
8				CLAYEY SAND (SC) Light brown, dry, fine and medium sand, some clay		
9						
10					18	
11						
12						
13					3	<10
14	B-21-14.0	■	56			

B-1-89/Modified

Geomatrix Consultants	Project No. 1459E	Figure A-26

PROJECT: KAISER
Oakland, California

Log of Boring No. B-21 cont'd.

J.D. Gallinatti

DEPTH (feet)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/ Foot	DESCRIPTION NAME (USCS Symbol): color, moist, % by wt., plast., density, structure, cementation, react. w/HCl, geo. inter.	PID Results (ppm)	Analytical Results For Mineral Spirits (ppm)
15				SAND (SP) Light brown, dry, medium and fine sand, trace clay		
16				SANDY CLAY (CL) Light brown, dry, clay, some medium and fine sand, low plasticity, firm		
17						
18					0	
19						
20					0	
21						
22				Increasing sand		
23						
24						
25					0	
				Bottom of boring 25.0 feet		
26						
27						
28						
29						
30						
31						

B-2-89/Modified

Geomatrix Consultants	Project No. 1459E	Figure A-27

PROJECT: KAISER Oakland, California		**Log of Boring No. B-22**	
BORING LOCATION On grass near excavation		ELEVATION AND DATUM	
DRILLING CONTRACTOR Access Drilling		DATE STARTED 3/12/90	DATE FINISHED 3/12/90
DRILLING METHOD Minuteman		TOTAL DEPTH 25'	MEASURING POINT
DRILLING EQUIPMENT 3" OD solid stem auger		DEPTH TO WATER: FIRST ---	COMPL. --- / 24 HRS. ---
SAMPLING METHOD 2 1/2" OD California modified		LOGGED BY C.D. Young	
HAMMER WEIGHT 70 lbs.	DROP 30"	RESPONSIBLE PROFESSIONAL J.D. Gallinatti	REG. NO. CEG1335

DEPTH (feet)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/Foot	DESCRIPTION NAME (USCS Symbol): color, moist, % by wt., plast., density, structure, cementation, react. w/HCl, geo. inter.	PID Results (ppm)	Analytical Results For Mineral Spirits (ppm)
				Surface Elevation:		
1				SILTY CLAY (CL) Dark green-gray, moist, clay, some silt, medium plasticity, very soft		
2					0	
3						
4				SAND Light brown, dry, medium sand, little clay		
5					0	
6	B-22-6.0		19			<10
7						
8					0	
9				Less clay		
10					0	
11						
12						
13						
14						

B-1-89/Modified

Geomatrix Consultants	Project No. 1459E	Figure A-28

PROJECT: KAISER
Oakland, California

Log of Boring No. B-22 cont'd.

DEPTH (feet)	SAMPLES Sample No.	SAMPLES Sample	SAMPLES Blows/ Foot	DESCRIPTION NAME (USCS Symbol): color, moist, % by wt., plast., density, structure, cementation, react. w/HCl, geo. inter.	PID Results (ppm)	Analytical Results For Mineral Spirits (ppm)
15					0	
	B-22-16.0		49			Held
16						
17						
18				SANDY CLAY (CL) Light brown, dry, clay, some medium sand, low plasticity, firm		
19						
20					0	
21						
22						
23						
24						
25				Bottom of boring 25.0 feet	0	
26						
27						
28						
29						
30						
31						

B-2-89/Modified

PROJECT: KAISER Oakland, California		**Log of Boring No. B-23**	
BORING LOCATION On grass near excavation		ELEVATION AND DATUM	
DRILLING CONTRACTOR Access Drilling		DATE STARTED 3/13/90	DATE FINISHED 3/13/90
DRILLING METHOD Minuteman		TOTAL DEPTH 25'	MEASURING POINT
DRILLING EQUIPMENT 3" OD solid stem auger		DEPTH TO WATER: FIRST ---	COMPL. --- / 24 HRS. ---
SAMPLING METHOD 2 1/2" OD California modified		LOGGED BY C.D. Young	
HAMMER WEIGHT 70 lbs.	DROP 30"	RESPONSIBLE PROFESSIONAL J.D. Gallinatti	REG. NO. CEG1335

DEPTH (feet)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/Foot	DESCRIPTION NAME (USCS Symbol): color, moist, % by wt., plast., density, structure, cementation, react. w/HCl, geo. inter. Surface Elevation:	PID Results (ppm)	Analytical Results For Mineral Spirits (ppm)
1				SILTY CLAY (CL) Dark brown, moist, clay, some silt, trace coarse sand, medium plasticity, soft		
2						
3					0	
4				SANDY CLAY Light brown, moist, clay, some medium sand, medium plasticity, soft		
5						
6	B-23-6.0		47		0	<10
7						
8				CLAY SAND Light brown, dry, medium sand, little clay		
9						
10					0	
11						
12						
13						
14						

B-1-89/Modified

PROJECT: KAISER
Oakland, California

Log of Boring No. B-23 cont'd.

DEPTH (feet)	SAMPLES Sample No.	SAMPLES Sample	SAMPLES Blows/ Foot	DESCRIPTION NAME (USCS Symbol): color, moist, % by wt., plast., density, structure, cementation, react. w/HCl, geo. inter.	PID Results (ppm)	Analytical Results For Mineral Spirits (ppm)
15					0	
16						
17				Gradational contact		
18				SANDY CLAY (CL) Light brown, dry, clay, some medium sand, low plasticity, firm		
19						
20					0	
21						
22						
23						
24						
25				Bottom of boring 25.0 feet	0	
26						
27						
28						
29						
30						
31						

B-2-89/Modified

PROJECT: KAISER Oakland, California			**Log of Boring No. B-24**	
BORING LOCATION On grass at top of excavation behind new fence			ELEVATION AND DATUM	
DRILLING CONTRACTOR Access Drilling			DATE STARTED 3/13/90	DATE FINISHED 3/13/90
DRILLING METHOD Minuteman			TOTAL DEPTH 31'	MEASURING POINT
DRILLING EQUIPMENT 3" OD solid stem auger			DEPTH TO WATER / FIRST --- / COMPL. --- / 24 HRS. ---	
SAMPLING METHOD 2 1/2" OD California modified			LOGGED BY C.D. Young	
HAMMER WEIGHT 70 lbs.	DROP 30"		RESPONSIBLE PROFESSIONAL J.D. Gallinatti	REG. NO. CEG1335

DEPTH (feet)	SAMPLES Sample No.	SAMPLES Sample	SAMPLES Blows/Foot	DESCRIPTION NAME (USCS Symbol): color, moist, % by wt., plast., density, structure, cementation, react. w/HCl, geo. inter. Surface Elevation:	PID Results (ppm)	Analytical Results For Mineral Spirits (ppm)
1				SILTY CLAY (CL) Dark green-gray, moist, clay, some silt, medium plasticity, very soft		
2						
3					0	
4				SANDY CLAY (CL) Light brown, moist, clay, some medium sand, medium plasticity, soft		
5					200	
6	B-24-6.0		38	CLAYEY SAND (SC) Light brown, dry, medium sand, little clay		<10
7						
8					50	
9						
10					75	
11						
12					50	
13						
14						

B-1-89/Modified

PROJECT: KAISER
Oakland, California

Log of Boring No. B-25

BORING LOCATION Top of excavation, southwest corner		ELEVATION AND DATUM		
DRILLING CONTRACTOR Access Drilling		DATE STARTED 3/15/90	DATE FINISHED 3/15/90	
DRILLING METHOD Minuteman		TOTAL DEPTH 25'	MEASURING POINT	
DRILLING EQUIPMENT 3" OD solid stem auger		DEPTH TO WATER	FIRST ---	COMPL. --- / 24 HRS. ---
SAMPLING METHOD 2 1/2" OD California modified		LOGGED BY C.D. Young		
HAMMER WEIGHT 70 lbs.	DROP 30"	RESPONSIBLE PROFESSIONAL J.D. Gallinatti		REG. NO. CEG1335

DEPTH (feet)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/Foot	DESCRIPTION: NAME (USCS Symbol): color, moist, % by wt., plast., density, structure, cementation, react. w/HCl, geo. inter.	PID Results (ppm)	Analytical Results For Mineral Spirits (ppm)
				Surface Elevation:		
1				SILTY CLAY (CL) (FILL) Dark brown, moist, clay, some silt, little medium sand, low plasticity, soft, little concrete rubble		
2					0	
3				SILTY CLAY (CL) Light brown, moist, clay, some silt, medium plasticity, firm		
4						
5					0	
6						
7				SAND (SP) Light brown, medium sand, some coarse sand, some clay, little angular gravel		
8					0	
9				Little clay		
10	B-25-10.5		59		0	<10
11						
12					0	
13						
14						

B-1-89/Modified

PROJECT: KAISER
Oakland, California

Log of Boring No. B-25 cont'd.

DEPTH (feet)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/Foot	DESCRIPTION: NAME (USCS Symbol): color, moist, % by wt., plast., density, structure, cementation, react. w/HCl, geo. inter.	PID Results (ppm)	Analytical Results For Mineral Spirits (ppm)
15					0	
16				Some clay		
17					0	
18				SANDY CLAY Light brown, dry, clay, some medium sand, low plasticity, firm		
19						
20					0	
21						
22						
23						
24						
25				Bottom of boring 25 feet	0	
26						
27						
28						
29						
30						
31						

B-2-89/Modified

PROJECT: KAISER
Oakland, California

Log of Boring No. B-26

BORING LOCATION East of water tank at top of retaining wall		ELEVATION AND DATUM		
DRILLING CONTRACTOR Access Drilling		DATE STARTED 3/15/90	DATE FINISHED 3/15/90	
DRILLING METHOD Minuteman		TOTAL DEPTH 23.5'	MEASURING POINT	
DRILLING EQUIPMENT 3" OD solid stem auger		DEPTH TO WATER	FIRST 23.0	COMPL. 23.0 / 24 HRS. ---
SAMPLING METHOD 2 1/2" OD California modified		LOGGED BY C.D. Young		
HAMMER WEIGHT 70 lbs.	DROP 30"	RESPONSIBLE PROFESSIONAL J.D. Gallinatti		REG. NO. CEG1335

DEPTH (feet)	SAMPLES Sample No.	SAMPLES Sample	SAMPLES Blows/Foot	DESCRIPTION NAME (USCS Symbol): color, moist, % by wt., plast., density, structure, cementation, react. w/HCl, geo. inter. Surface Elevation:	PID Results (ppm)	Analytical Results For Mineral Spirits (ppm)
1				SANDY CLAY (CL) Light brown, moist, clay, some medium sand, low plasticity, soft		
2						
3					<1	
4						
5				GRAVELLY SAND (SW) Light brown, dry, medium and coarse sand, some subrounded gravel to 1" diameter, trace clay	2	
6	B-26-6.0		29		0	<10
7			59		0	
8			55		1	
9					0	
10						
11						
12					2	
13						
14						

B-1-89/Modified

PROJECT: KAISER
Oakland, California

Log of Boring No. B-26 cont'd.

DEPTH (feet)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/Foot	DESCRIPTION: NAME (USCS Symbol); color, moist, % by wt., plast., density, structure, cementation, react. w/HCl, geo. inter.	PID Results (ppm)	Analytical Results For Mineral Spirits (ppm)
15				CLAYEY SAND (SC) — Gradational contact Light brown, dry, medium and fine sand, some clay	<1	
16						
17				Little clay	1	
18						
19						
20				Some clay	0	
21				Trace clay		
22				Very moist	0	
23	B-26-23.5		55	Wet ▽		<10
24				Bottom of boring 23.5 feet		
25						
26						
27						
28						
29						
30						
31						

B-2-89/Modified

PROJECT: KAISER
Oakland, California

Log of Boring No. B-27

BORING LOCATION West of Mechanical building	ELEVATION AND DATUM		
DRILLING CONTRACTOR Access Drilling	DATE STARTED 3/15/90	DATE FINISHED 3/15/90	
DRILLING METHOD Minuteman	TOTAL DEPTH 15'	MEASURING POINT	
DRILLING EQUIPMENT 3" OD solid stem auger	DEPTH TO WATER	FIRST ---	COMPL. --- / 24 HRS. ---
SAMPLING METHOD 2 1/2" OD California modified	LOGGED BY C.D. Young		
HAMMER WEIGHT 70 lbs. / DROP 30"'	RESPONSIBLE PROFESSIONAL J.D. Gallinatti	REG. NO. CEG1335	

DEPTH (feet)	SAMPLES Sample No.	SAMPLES Sample	SAMPLES Blows/Foot	DESCRIPTION NAME (USCS Symbol): color, moist, % by wt., plast., density, structure, cementation, react. w/HCl, geo. inter. Surface Elevation:	PID Results (ppm)	Analytical Results For Mineral Spirits (ppm)
1				3" asphalt SAND (SP) Light brown, dry, medium sand, little coarse sand and subangular gravel, trace clay	2	
2					1	
3						
4						
5					0	
6				SANDY CLAY (CL) Light brown, moist, clay, some medium and fine sand, low plasticity, firm		
7						
8					0	
9						
10					0	
13					(12.5 ft)	
14				CLAYEY SAND (SC) Light brown, moist, medium sand, little clay		
15					0	
16				Bottom of boring 15 feet		

8-1-89/Modified

Geomatrix Consultants	Project No. 1459E	Figure A-38

PROJECT: KAISER Oakland, California	**Log of Boring No. B-28**
BORING LOCATION West of Mechanical building near paint shed	ELEVATION AND DATUM
DRILLING CONTRACTOR Access Drilling	DATE STARTED 3/16/90 / DATE FINISHED 3/16/90
DRILLING METHOD Minuteman	TOTAL DEPTH 15' / MEASURING POINT
DRILLING EQUIPMENT 3" OD solid stem auger	DEPTH TO WATER / FIRST --- / COMPL. --- / 24 HRS. ---
SAMPLING METHOD 2 1/2" OD California modified	LOGGED BY C.D. Young
HAMMER WEIGHT 70 lbs. / DROP 30"'	RESPONSIBLE PROFESSIONAL J.D. Gallinatti / REG. NO. CEG1335

DEPTH (feet)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/Foot	DESCRIPTION NAME (USCS Symbol): color, moist, % by wt., plast., density, structure, cementation, react. w/HCl, geo. inter. Surface Elevation:	PID Results (ppm)	Analytical Results For Mineral Spirits (ppm)
1				SANDY CLAY (CL) Light brown, moist, clay, some medium sand, medium plasticity, soft		
2						
3					0	
4						
5				More sand	4	
6						
7				CLAYEY SAND (SC) Light brown, dry, medium and fine sand, little clay		
8					3	
9						
10				Few clay	3	
11						
12					<1 (12.0 ft)	
13						
14					0	
15				Bottom of boring 15 feet	0	
16						

B-1-89/Modified

Geomatrix Consultants	Project No. 1459E	Figure A-39

PROJECT: KAISER Oakland, California		**Log of Boring No. B-29**			
BORING LOCATION W. of Mechanical building near W. end of paint shed		ELEVATION AND DATUM			
DRILLING CONTRACTOR Access Drilling		DATE STARTED 3/16/90	DATE FINISHED 3/16/90		
DRILLING METHOD Minuteman		TOTAL DEPTH 15'	MEASURING POINT		
DRILLING EQUIPMENT 3" OD solid stem auger		DEPTH TO WATER	FIRST ---	COMPL. ---	24 HRS. ---
SAMPLING METHOD 2 1/2" OD California modified		LOGGED BY C.D. Young			
HAMMER WEIGHT 70 lbs.s.	DROP 30"'	RESPONSIBLE PROFESSIONAL J.D. Gallinatti		REG. NO. CEG1335	

DEPTH (feet)	SAMPLES Sample No.	SAMPLES Sample	SAMPLES Blows/ Foot	DESCRIPTION NAME (USCS Symbol): color, moist, % by wt., plast., density, structure, cementation, react. w/HCl, geo. inter. Surface Elevation:	PID Results (ppm)	Analytical Results For Mineral Spirits (ppm)
1				CLAYEY SAND (SC) Light brown, dry, fine sand, little clay		
2				SANDY CLAY (CL) Light brown, dry, clay, some fine sand, low plasticity, firm	0	
3						
4					0	
5						
6					0	
7				CLAYEY SAND (SC) Light brown, dry, fine sand, little clay, top 1 foot reddish brown		
8					0	
9						
10					0	
13				Some clay	0 (12.0 ft)	
14				Moist	0	
15				Bottom of boring 15 feet	0	
16						

B-1-89/Modified

Geomatrix Consultants	Project No. 1459E	Figure A-40

PROJECT: KAISER Oakland, California	**Log of Boring No. B-30**
BORING LOCATION: W. of Mechanical building - NW corner of proposed basement excavation	ELEVATION AND DATUM
DRILLING CONTRACTOR: Access Drilling	DATE STARTED: 3/16/90 / DATE FINISHED: 3/16/90
DRILLING METHOD: Minuteman	TOTAL DEPTH: 15' / MEASURING POINT
DRILLING EQUIPMENT: 3" OD solid stem auger	DEPTH TO WATER: FIRST ---, COMPL. ---, 24 HRS. ---
SAMPLING METHOD: 2 1/2" OD California modified	LOGGED BY: C.D. Young
HAMMER WEIGHT: 70 lbs. / DROP: 30"	RESPONSIBLE PROFESSIONAL: J.D. Gallinatti / REG. NO.: CEG1335

DEPTH (feet)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/Foot	DESCRIPTION NAME (USCS Symbol): color, moist, % by wt., plast., density, structure, cementation, react. w/HCl, geo. inter. Surface Elevation:	PID Results (ppm)	Analytical Results For Mineral Spirits (ppm)
1				SAND (SP) Light brown, dry, medium and fine sand, few clay		
2					0	
3						
4					0	
5						
6					0	
7				CLAYEY SAND (SC) Reddish brown, dry, medium and fine sand, some clay		
8					0	
9						
10					0	
13					0 (12.0 ft)	
14				Less clay	0	
15				Bottom of boring 15 feet	0	
16						

B-1-89/Modified

Geomatrix Consultants	Project No. 1459E	Figure A-41

PROJECT: KAISER Oakland, California	**Log of Boring No. B-31**
BORING LOCATION: W. of Mechanical building - north side of proposed basement excavation	ELEVATION AND DATUM
DRILLING CONTRACTOR: Access Drilling	DATE STARTED: 3/16/90 / DATE FINISHED: 3/16/90
DRILLING METHOD: Minuteman	TOTAL DEPTH: 15' / MEASURING POINT
DRILLING EQUIPMENT: 3" OD solid stem auger	DEPTH TO WATER: FIRST ---, COMPL. ---, 24 HRS. ---
SAMPLING METHOD: 2 1/2" OD California modified	LOGGED BY: C.D. Young
HAMMER WEIGHT: 70 lbs.s. / DROP 30"'	RESPONSIBLE PROFESSIONAL: J.D. Gallinatti / REG. NO. CEG1335

DEPTH (feet)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/ Foot	DESCRIPTION NAME (USCS Symbol): color, moist, % by wt., plast., density, structure, cementation, react. w/HCl, geo. inter. Surface Elevation:	PID Results (ppm)	Analytical Results For Mineral Spirits (ppm)
1				SAND (SP) Light brown, dry, medium and fine sand, few clay		
2					0	
3						
4					0	
5						
6				Trace clay	0	
7						
8				CLAYEY SAND (SC) Light brown, dry, medium and fine sand, some clay	0	
9						
10					0	
12					0 (12.0 ft)	
13						
14				SANDY CLAY (CL) Light brown, moist, clay, some fine sand, low plasticity, firm		
15					0	
				Bottom of boring 15 feet		
16						

B-1-89/Modified

Geomatrix Consultants	Project No. 1459E	Figure A-42

PROJECT: KAISER
Oakland, California

Log of Boring No. B-32

BORING LOCATION Top of excavation by residential property		ELEVATION AND DATUM		
DRILLING CONTRACTOR Access Drilling		DATE STARTED 3/16/90	DATE FINISHED 3/16/90	
DRILLING METHOD Minuteman		TOTAL DEPTH 15'	MEASURING POINT	
DRILLING EQUIPMENT 3" OD solid stem auger		DEPTH TO WATER	FIRST ---	COMPL. --- / 24 HRS. ---
SAMPLING METHOD 2 1/2" OD California modified		LOGGED BY C.D. Young		
HAMMER WEIGHT 70 lbs.	DROP 30"'	RESPONSIBLE PROFESSIONAL J.D. Gallinatti		REG. NO. CEG1335

DEPTH (feet)	SAMPLES Sample No.	SAMPLES Sample	SAMPLES Blows/ Foot	DESCRIPTION NAME (USCS Symbol): color, moist, % by wt., plast., density, structure, cementation, react. w/HCl, geo. inter. Surface Elevation:	PID Results (ppm)	Analytical Results For Mineral Spirits (ppm)
1				SILTY CLAY (CL) Dark gray, moist, clay, little silt, medium plasticity, soft		
2					1	
3						
4					0	
5				SANDY CLAY (CL) Light brown, moist, clay, some fine sand, low plasticity, firm		
6					0	
7						
8				Increasing sand	0	
9				Gradational contact CLAYEY SAND (SC) Light brown, dry, medium and fine sand, little clay		
10					0	
13					0 (11.5 ft)	
14						
15				Bottom of boring 15 feet	0	
16						

B-1-89/Modified

APPENDIX B

FIELD METHODS

B.1 Photoionization Detector Quality Assurance

The photoionization detector (PID) was calibrated daily at the onset of this project and weekly after 2 March 1990 with an 80 parts per million isobutylene calibration gas. The PID was adjusted as necessary. The PID was zeroed each morning after a short warm-up period and was rechecked after each sample reading. The PID returned to zero after being allowed sufficient time to purge and did not require re-zeroing during use.

B.2 Excavation No. 1 - Monitoring and Soil Sampling

Excavation near the mechanical building was initiated on 12 February 1990. Excavated soils were screened with a PID for volatile organic compounds (VOCs) as soil was excavated. Soil in the backhoe bucket was screened by scraping away a few inches of soil and immediately bringing the PID probe within 1/4 inch of the soil. Soil affected by mineral spirits were stockpiled and later disposed of by Kaiser at a Class I facility. By midday on 13 February, the extent of detectable mineral spirits in the soil was identified to the north, west, and southwest. Five soil samples were collected from the sides and base of the excavation to confirm the absence of mineral spirits in these areas (Figure 2). Soil samples were collected by driving a clean brass liner into the soil with a hammer sampler, then covering the liner ends with aluminum foil, a plastic cap, and PVC tape. The soil samples were immediately placed on ice, and delivered to BC Analytical at the end of the day under chain-of-custody procedures. At the eastern limit of the excavation at the edge of the mechanical building VOCs were detected. A 12-foot-long horizontal boring was drilled with a hand auger five feet beneath the building to evaluate the lateral extent of affected soils beneath the mechanical building. Because of building stability concerns, the excavation of soil containing mineral spirits was not completed vertically just west of the mechanical building or at the southwest corner of the building beneath the PG&E red concrete-cased utility line.

Shoring for the west side of the mechanical building and soil excavation for the basement area was completed by 25 April 1990. One sample from the floor of the excavation just west of the mechanical building was collected by Geomatrix at this time and delivered to BC Analytical for mineral spirits analysis.

B.3 Soil Borings in Mechanical Building

Between 27 February and 2 March 1990, six soil borings were drilled inside the mechanical building (MB-1 through MB-6). These borings were drilled with a hand auger to depths of 13.0 to 18.5 feet by Kaiser Construction Services personnel under supervision of a Geomatrix geologist. The boring logs are presented in Appendix B. Soil samples were collected in plastic bags from the hand auger approximately every 2.5 feet and were screened with the PID for VOCs. Approximately one undisturbed soil sample per boring was collected in a clean brass liner directly from the hand auger. The undisturbed samples were covered with aluminum foil, capped, taped, placed on ice, and delivered to BC Analytical for chemical analysis. All soil borings were backfilled with cement grout.

B.4 Soil Borings Beside Mechanical Building

Under supervision of a Geomatrix geologist, 13 borings were drilled around the east and north perimeter of the mechanical building between 27 February and 1 March 1990, as shown on Figure 2. Borings B-8 through B-11 were drilled by Access Drilling of San Jose using a portable Minuteman drill rig fitted with 3-inch-diameter solid-stem augers. Borings B-12 through B-19 were drilled by Aqua Science Engineers using a B-57 truck-mounted drill rig equipped with 6-inch-diameter solid-stem augers. Soil samples were collected in plastic bags from the cuttings approximately every 2.5 feet and were screened for VOCs with the PID. Approximately one to two undisturbed soil samples were collected from each boring using a 2.5-inch outter diameter (O.D.), modified California split-spoon sampler lined with clean brass liners, driven by a 140-lb hammer falling 30 inches. The undisturbed soil samples were handled and preserved as described in Section B.3 and delivered to BC

Analytical under chain-of-custody procedures at the end of each day. The boring logs are presented in Appendix A.

Five borings were drilled along the north side of Excavation # 1 to a depth of approximately 15 feet to confirm the absence of mineral spirits in this area. The borings were drilled on 16 March 1990 using a portable Minuteman drill rig fitted with 3-inch-diameter solid-stem augers. Soil samples were collected in plastic bags approximately every 2.5 feet and screened with the PID for VOCs. No confirmation soil samples were acquired in this area for laboratory analysis.

3.6 Soil Borings on Hillside Area

Between 12 and 16 March 1990, eight borings were drilled in the hillside area at the top of Excavation # 2, as shown on Figure 2. Under supervision of a Geomatrix geologist, borings B-20 through B-26 and B-32 were drilled by Access Drilling of San Jose using a portable Minuteman drill rig as described in Section 4.0. Soil samples were collected in plastic bags from the cuttings approximately every 2.5 feet and were screened using the PID for VOCs. Approximately one to two undisturbed soil samples were collected from each boring for laboratory analysis using a 2.5-inch O.D., modified California split-spoon sampler lined with clean brass liners, driven by a 140-lb hammer falling 30 inches. The undisturbed soil samples were preserved as described above (Section B.3) and delivered to BC Analytical under chain-of-custody procedures at the end of each day. The boring logs are presented in Appendix A.

GEOMATRIX

APPENDIX C
Analytical Laboratory Reports and Chain-of Custody Records

Analytical Report

LOG NO: E90-02-369

Received: 12 FEB 90
Reported: 15 FEB 90

Ms. Cheri Young
Geomatrix Consultants
1 Market Plaza, Spear Tower, Ste.717
San Francisco, California 94105

Project: 1459C

REPORT OF ANALYTICAL RESULTS

LOG NO	SAMPLE DESCRIPTION, SOIL SAMPLES	DATE SAMPLED
02-369-1	E-1	12 FEB 90
02-369-2	E-2	12 FEB 90
02-369-3	E-3	12 FEB 90
02-369-4	E-4	12 FEB 90
02-369-5	E-5	12 FEB 90

PARAMETER	02-369-1	02-369-2	02-369-3	02-369-4	02-369-5
TPH and BTEX - Modified 8015					
Date Analyzed	02.13.90	02.13.90	02.13.90	02.13.90	02.13.90
Dilution Factor, Times	1	1	1	1	1
Benzene, mg/kg	<0.3	<0.3	<0.3	<0.3	<0.3
Ethylbenzene, mg/kg	<0.3	<0.3	<0.3	<0.3	<0.3
Toluene, mg/kg	<0.3	<0.3	<0.3	<0.3	<0.3
Total Xylene Isomers, mg/kg	<0.3	<0.3	<0.3	<0.3	<0.3
Total Fuel Hydrocarbons, mg/kg	<10	<10	<10	<10	<10
Other TPH and BTEX - Modified 8015	---	---	---	---	---

Sim D. Lessley, Ph.D., Laboratory Director

1255 Powell Street
Emeryville, CA 94608

415/428-2300
Fax: 415/547-3643

BCA B C Analytical

BROWN AND CALDWELL ANALYTICAL LABORATORIES

BATCH QC REPORT
Definitions and Terms

Accuracy: The ability of a procedure to determine the "true" concentration of an analyte.

Batch: A group of samples analyzed sequentially using the same calibration curve, reagents, and instrument.

Laboratory Control Standard (LCS): Laboratory reagent water spiked with known compounds and subjected to the same procedures as the samples. The LCS thus indicates the accuracy of the analytical method and, because it is prepared from a different source than the standard used to calibrate the instrument, it also serves to double-check the calibration.

LC Result: Laboratory result of an LCS analysis.

LT Result: Expected result, or true value, of the LCS analysis.

Matrix QC: Quality control tests performed on actual client samples. For most inorganic analyses, the laboratory uses a pair of duplicate samples and a spiked sample. For most organic analyses, the laboratory uses a pair of spiked samples (duplicate spikes).

Percent Recovery: The percentage of analyte recovered.
For LCS, the percent recovery calculation is

$$LC \div LT \times 100.$$

For spike recoveries, the percent recovery calculatiion is

$$\frac{(\text{S Bar} - \text{Sample Concentration})}{\text{Spike Amount}} \times 100$$

Precision: The reproducibility of a procedure demonstrated by the agreement between analyses performed on either duplicates of the same sample or a pair of duplicate spikes.

R1, R2 Result: Result of the analysis of replicate aliquots of a sample, with R1 indicating the first analysis of the sample and R2 its corresponding duplicate; used to determine precision.

Relative Percent Difference (RPD): Calculated using one of the following:

$$\frac{(R1 - R2) \times 100}{(R1 + R2) \div 2} \qquad \frac{(S1 - S2) \times 100}{(S1 + S2) \div 2}$$

S Bar Result: The average of spike analysis results.

S1, S2 Result: Result of the analysis of replicate spiked aliquots, with S1 indicating one spike of the sample and S2 the second spike; used to determine precision and accuracy.

True value: The theoretical, or expected, result of a spike sample analysis.

BC ANALYTICAL

BATCH QC REPORT
ORDER E9002369

DATE REPORTED : 02/22/90

MATRIX QC PRECISION (DUPLICATE SPIKES)

PARAMETER	DATE ANALYZED	BATCH NUMBER	S1 RESULT	S2 RESULT	UNIT	RELATIVE % DIFF
TPH and BTEX - Modified 8015						
Dilution Factor	02.13.90	41	1	1	Times	0
Total Fuel Hydrocarbons	02.13.90	41	230	245	mg/kg	6

BC ANALYTICAL

BATCH QC REPORT
ORDER E9002369

DATE REPORTED : 02/22/90

MATRIX QC ACCURACY (SPIKES)

PARAMETER	DATE ANALYZED	BATCH NUMBER	SBAR RESULT	TRUE VALUE	UNIT	PERCENT RECOVERY
TPH and BTEX - Modified 8015 Total Fuel Hydrocarbons	02.13.90	41	237.5	250	mg/kg	95

BC ANALYTICAL

BATCH QC REPORT
ORDER E9002369

DATE REPORTED : 02/22/90

METHOD BLANKS AND REPORTING DETECTION LIMIT (RDL)

PARAMETER	DATE ANALYZED	BATCH NUMBER	BLANK RESULT	RDL	UNIT
TPH and BTEX - Modified 8015					
Date Analyzed	02.13.90	41	02.13.90	NA	Date
Dilution Factor	02.13.90	41	1	NA	Times
Benzene	02.13.90	41	0	NA	mg/L
Ethylbenzene	02.13.90	41	0	NA	mg/L
Toluene	02.13.90	41	0	NA	mg/L
Total Xylene Isomers	02.13.90	41	0	NA	mg/L
Total Fuel Hydrocarbons	02.13.90	41	0.088	NA	mg/L

: ORDER PLACED FOR CLIENT: Geomatrix Consultants 9002369 :
: BC ANALYTICAL : EMVL LAB : 10:08:45 22 FEB 1990 - P. 1 :

SAMPLES...	SAMPLE DESCRIPTION..	DETERM CODE....	DATE.... METHOD..... ANALYZED	EQUIP.	ID.NO
9002369*1	E-1	FUEL.TOT.BTEX	02.13.90 8015	516-08	7194
9002369*2	E-2	FUEL.TOT.BTEX	02.13.90 8015	516-08	7194
9002369*3	E-3	FUEL.TOT.BTEX	02.13.90 8015	516-08	7194
9002369*4	E-4	FUEL.TOT.BTEX	02.13.90 8015	516-08	7194
9002369*5	E-5	FUEL.TOT.BTEX	02.13.90 8015	516-08	7194

***

Notes: Equipment = BC Analytical identification number for a particular piece of analytical equipment.

ID.NO = BC Analytical employee identification number of analyst.

9002369 00695

GEOMATRIX CONSULTANTS
ONE MARKET PLAZA
SPEAR STREET TOWER SUITE 717
SAN FRANCISCO, CALIFORNIA 94105
(415) 957-9557

Chain of Custody Record

DATE 2/12/90 PAGE 1 OF 1

PROJECT NO. 1459c

SAMPLERS: (SIGNATURE) Elizabeth Klainer

DATE	TIME	SAMPLE NUMBER	GENERAL MINERAL	PRIORITY POLLUTANT METALS	EPA METHOD 624	EPA METHOD 625	EPA METHOD 601	EPA METHOD 602	EPA METHOD 608	PETROLEUM HYDROCARBONS BTEX	PETROLEUM HYDROCARBONS TPH*				NUMBER OF CONTAINERS
2/12	1310	E-1								X	X				1
	1340	E-2								X	X				1
	1415	E-3								X	X				1
	1445	E-4								X	X				1
2/12	1500	E-5								X	X				1

ANALYSES

REMARKS (SAMPLE PRESERVATION, HANDLING PROCEDURES, OBSERVATIONS, ETC.)

FUEL TOT BTEX

24 hour turnaround

* Modified 8015, detection limit for mineral spirits 10 ppm

* detection limit for BTEX 0.3 ppm or lower if possible

Results to Cheri Young

Questions to Chelsea Ho

TOTAL NUMBER OF CONTAINERS 5

RELINQUISHED BY:	DATE	RECEIVED BY:
SIGNATURE		SIGNATURE
PRINTED NAME	TIME	PRINTED NAME
COMPANY		COMPANY
RELINQUISHED BY: Elizabeth Klainer	DATE 2/12/90	RECEIVED BY: (LAB) BCAL
SIGNATURE Elizabeth Klainer	TIME 1635	SIGNATURE Monika Scott
PRINTED NAME Geomatrix		PRINTED NAME Monika Scott
COMPANY		LABORATORY
RELINQUISHED BY:	DATE	RECEIVED BY:
SIGNATURE		SIGNATURE
PRINTED NAME	TIME	PRINTED NAME
COMPANY		COMPANY

METHOD OF SHIPMENT: Hand delivery

LABORATORY COMMENTS / OBSERVATIONS

Log # E9002369

DISTRIBUTION: WHITE, CANARY - LABORATORY, PINK - ORIGINATOR

Analytical Report

LOG NO: E90-02-842

Received: 27 FEB 90
Reported: 28 FEB 90

Ms. Cheri Young
Geomatrix Consultants
1 Market Plaza, Spear Tower, Ste.717
San Francisco, California 94105

Project: 1459C

REPORT OF ANALYTICAL RESULTS

LOG NO	SAMPLE DESCRIPTION, SOIL SAMPLES	DATE SAMPLED
02-842-1	B-8-15.0	27 FEB 90
02-842-2	B-9-15.0	27 FEB 90
02-842-3	B-10-15.0	27 FEB 90
02-842-4	B-11-15.0	27 FEB 90
02-842-5	MB-1-18.5	27 FEB 90

PARAMETER	02-842-1	02-842-2	02-842-3	02-842-4	02-842-5
TPH and BTEX - Modified 8015					
Date Analyzed	02.27.90	02.27.90	02.27.90	02.27.90	02.27.90
Dilution Factor, Times	1	1	1	1	1
Benzene, mg/kg	<0.3	<0.3	<0.3	<0.3	<0.3
Ethylbenzene, mg/kg	<0.3	<0.3	<0.3	<0.3	<0.3
Toluene, mg/kg	<0.3	<0.3	<0.3	<0.3	<0.3
Total Xylene Isomers, mg/kg	<0.3	<0.3	<0.3	<0.3	<0.3
Total Fuel Hydrocarbons, mg/kg	<10	<10	<10	<10	<10
Other TPH and BTEX - Modified 8015	---	---	---	---	---

Sim D. Lessley, Ph.D., Laboratory Director

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BCA B C Analytical

LOG # 9002842

GEOMATRIX CONSULTANTS
ONE MARKET PLAZA
SPEAR STREET TOWER SUITE 717
SAN FRANCISCO, CALIFORNIA 94105
(415) 957-9557

Chain of Custody Record

0644

DATE 2/27/90 PAGE 1 OF 1

PROJECT NO. 1459C

SAMPLERS: (SIGNATURE) Cheri Young

DATE	TIME	SAMPLE NUMBER	GENERAL MINERAL	PRIORITY POLLUTANT METALS	EPA METHOD 624	EPA METHOD 625	EPA METHOD 601	EPA METHOD 602	EPA METHOD 608	PETROLEUM HYDROCARBONS	Mineral Spirits, BTXE				NUMBER OF CONTAINERS
2/27	11:35	B-8-15.0									X				1
	1:05	B-9-15.0									X				1
	2:05	B-10-15.0									X				1
	3:07	B-11-15.0									X				1
↓	2:20	MB-1-18.5									X				1

ANALYSES

REMARKS (SAMPLE PRESERVATION, HANDLING PROCEDURES, OBSERVATIONS, ETC.)

Soil samples cooled to 4°C

*24-hour turnaround

Results to Cheri Young
Field fax # 596-4832

TOTAL NUMBER OF CONTAINERS 5

RELINQUISHED BY:	DATE	RECEIVED BY:	RELINQUISHED BY:	DATE	RECEIVED BY: (LAB)
SIGNATURE		SIGNATURE	Cheri Young	2/27	Monika Scott
PRINTED NAME	TIME	PRINTED NAME	CHERI YOUNG	TIME	SIGNATURE
COMPANY		COMPANY	PRINTED NAME: Geomatrix	5:02	PRINTED NAME: Monika Scott
			COMPANY		LABORATORY: BCAL

RELINQUISHED BY:	DATE	RECEIVED BY:
SIGNATURE		SIGNATURE
PRINTED NAME	TIME	PRINTED NAME
COMPANY		COMPANY

METHOD OF SHIPMENT: hand delivery

LABORATORY COMMENTS / OBSERVATIONS

DISTRIBUTION: WHITE, CANARY - LABORATORY, PINK - ORIGINATOR

Analytical Report

LOG NO: E90-02-895

Received: 28 FEB 90
Reported: 15 MAR 90

REVISED 3/20/90

Ms. Cheri Young
Geomatrix Consultants
1 Market Plaza, Spear Tower, Ste.717
San Francisco, California 94105

Project: 1459C

REPORT OF ANALYTICAL RESULTS

LOG NO	SAMPLE DESCRIPTION, SOIL SAMPLES	DATE SAMPLED
02-895-1	MB-2-10.0	28 FEB 90
02-895-2	MB-2-15.0	28 FEB 90
02-895-3	MB-2-18.0	28 FEB 90
02-895-4	MB-3-10.0	28 FEB 90
02-895-5	MB-4-10.0	28 FEB 90

PARAMETER	02-895-1	02-895-2	02-895-3	02-895-4	02-895-5
Sample Held, Not Analyzed	---	HELD	---	---	---
TPH-Volatile Hydrocarbons/BTEX					
Date Analyzed	02.28.90	---	02.28.90	02.28.90	02.28.90
Dilution Factor, Times	1	---	1	1	1
Benzene, mg/kg	<0.3	---	<0.3	<0.3	<0.3
Ethylbenzene, mg/kg	<0.3	---	<0.3	<0.3	<0.3
Toluene, mg/kg	<0.3	---	<0.3	<0.3	<0.3
Total Xylene Isomers, mg/kg	<0.3	---	<0.3	<0.3	<0.3
C4 to C12 Hydrocarbons, mg/kg	<10	---	<10	<10	<10
Fuel Characterization, .	---	---	---	---	---

1255 Powell Street
Emeryville, CA 94608

415/428-2300
Fax: 415/547-3643

BCA B C Analytical

Analytical Report

LOG NO: E90-02-895

Received: 28 FEB 90
Reported: 15 MAR 90

Ms. Cheri Young
Geomatrix Consultants
1 Market Plaza, Spear Tower, Ste.717
San Francisco, California 94105

Project: 1459C

REPORT OF ANALYTICAL RESULTS

LOG NO	SAMPLE DESCRIPTION, SOIL SAMPLES	DATE SAMPLED
02-895-6	H-3	28 FEB 90

PARAMETER	02-895-6
TPH-Volatile Hydrocarbons/BTEX	
Date Analyzed	02.28.90
Dilution Factor, Times	50
Benzene, mg/kg	<5
Ethylbenzene, mg/kg	<5
Toluene, mg/kg	<5
Total Xylene Isomers, mg/kg	120
C4 to C12 Hydrocarbons, mg/kg	1500
Fuel Characterization, .	MIN.SPIRIT

This report was revised to correct previously reported detection limits.
C. Ho 3/20/90

This Fuel characterization is a qualitative identification based upon a visual comparison of sample chromatograms with those from authentic standards.

Sim D. Lessley, Ph.D., Laboratory Director

1255 Powell Street
Emeryville, CA 94608

415/428-2300
Fax: 415/547-3643

BCA B C Analytical

Analytical Report

LOG NO: E90-03-041

Received: 01 MAR 90
Reported: 02 MAR 90

Ms. Cheri Young
Geomatrix Consultants
1 Market Plaza, Spear Tower, Ste.717
San Francisco, California 94105

Project: 1459C

REPORT OF ANALYTICAL RESULTS

LOG NO	SAMPLE DESCRIPTION, SOIL SAMPLES	DATE SAMPLED
03-041-1	B-12-5.0	01 MAR 90
03-041-2	B-13-5.0	01 MAR 90
03-041-3	B-14-6.5	01 MAR 90
03-041-4	B-15-17.5	01 MAR 90
03-041-5	B-16-5.5	01 MAR 90

PARAMETER	03-041-1	03-041-2	03-041-3	03-041-4	03-041-5
TPH-Volatile Hydrocarbons/BTEX					
Date Analyzed	03.01.90	03.01.90	03.01.90	03.01.90	03.01.90
Dilution Factor, Times	1	1	1	1	1
Benzene, mg/kg	0.6	<0.3	<0.3	<0.3	<0.3
Ethylbenzene, mg/kg	0.6	<0.3	<0.3	<0.3	<0.3
Toluene, mg/kg	0.6	<0.3	<0.3	<0.3	<0.3
Total Xylene Isomers, mg/kg	1.4	<0.3	<0.3	<0.3	<0.3
C4 to C12 Hydrocarbons, mg/kg	34	<10	<10	<10	<10
Fuel Characterization, .	MIN.SPIRIT	---	---	---	---

This Fuel characterization is a qualitative identification based upon a visual comparison of sample chromatograms with those from authentic standards.

1255 Powell Street
Emeryville, CA 94608

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BCA *B C Analytical*

Analytical Report

LOG NO: E90-03-041

Received: 01 MAR 90
Reported: 02 MAR 90

Ms. Cheri Young
Geomatrix Consultants
1 Market Plaza, Spear Tower, Ste.717
San Francisco, California 94105

Project: 1459C

REPORT OF ANALYTICAL RESULTS

LOG NO	SAMPLE DESCRIPTION, SOIL SAMPLES	DATE SAMPLED
03-041-6	B-17-5.5	01 MAR 90
03-041-7	B-19-5.5	01 MAR 90

PARAMETER	03-041-6	03-041-7			
TPH-Volatile Hydrocarbons/BTEX					
Date Analyzed	03.01.90	03.01.90			
Dilution Factor, Times	1	1			
Benzene, mg/kg	<0.3	>0.3			
Ethylbenzene, mg/kg	<0.3	<0.3			
Toluene, mg/kg	<0.3	<0.3			
Total Xylene Isomers, mg/kg	<0.3	<0.3			
C4 to C12 Hydrocarbons, mg/kg	<10	<10			
Other TPH-Volatile Hydrocarbons/BTEX	---	---			

1255 Powell Street
Emeryville, CA 94608

415/428-2300
Fax: 415/547-3643

BCA *B C Analytical*

Analytical Report

LOG NO: E90-03-041

Received: 01 MAR 90
Reported: 02 MAR 90

Ms. Cheri Young
Geomatrix Consultants
1 Market Plaza, Spear Tower, Ste.717
San Francisco, California 94105

Project: 1459C

REPORT OF ANALYTICAL RESULTS

LOG NO	SAMPLE DESCRIPTION, SOIL SAMPLES	DATE SAMPLED
03-041-8	B-12-15.0	01 MAR 90
03-041-9	B-13-15.0	01 MAR 90
03-041-10	B-15-13.5	01 MAR 90
03-041-11	B-18-6.0	01 MAR 90

PARAMETER	03-041-8	03-041-9	03-041-10	03-041-11
Sample Held, Not Analyzed	HELD	HELD	HELD	HELD

Sim D. Lessley, Ph.D., Laboratory Director

1255 Powell Street
Emeryville, CA 94608

415/428-2300
Fax: 415/547-3643

B C Analytical

BROWN AND CALDWELL ANALYTICAL LABORATORIES

BATCH QC REPORT
Definitions and Terms

Accuracy: The ability of a procedure to determine the "true" concentration of an analyte.

Batch: A group of samples analyzed sequentially using the same calibration curve, reagents, and instrument.

Laboratory Control Standard (LCS): Laboratory reagent water spiked with known compounds and subjected to the same procedures as the samples. The LCS thus indicates the accuracy of the analytical method and, because it is prepared from a different source than the standard used to calibrate the instrument, it also serves to double-check the calibration.

LC Result: Laboratory result of an LCS analysis.

LT Result: Expected result, or true value, of the LCS analysis.

Matrix QC: Quality control tests performed on actual client samples. For most inorganic analyses, the laboratory uses a pair of duplicate samples and a spiked sample. For most organic analyses, the laboratory uses a pair of spiked samples (duplicate spikes).

Percent Recovery: The percentage of analyte recovered.
For LCS, the percent recovery calculation is

$$LC \div LT \times 100.$$

For spike recoveries, the percent recovery calculatiion is

$$\frac{(\text{S Bar} - \text{Sample Concentration})}{\text{Spike Amount}} \times 100$$

Precision: The reproducibility of a procedure demonstrated by the agreement between analyses performed on either duplicates of the same sample or a pair of duplicate spikes.

R1, R2 Result: Result of the analysis of replicate aliquots of a sample, with R1 indicating the first analysis of the sample and R2 its corresponding duplicate; used to determine precision.

Relative Percent Difference (RPD): Calculated using one of the following:

$$\frac{(R1 - R2) \times 100}{(R1 + R2) \div 2} \qquad \frac{(S1 - S2) \times 100}{(S1 + S2) \div 2}$$

S Bar Result: The average of spike analysis results.

S1, S2 Result: Result of the analysis of replicate spiked aliquots, with S1 indicating one spike of the sample and S2 the second spike; used to determine precision and accuracy.

True value: The theoretical, or expected, result of a spike sample analysis.

BC ANALYTICAL

BATCH QC REPORT
ORDER E9002041

DATE REPORTED : 03/06/90

MATRIX QC PRECISION (DUPLICATE SPIKES)

PARAMETER	DATE ANALYZED	BATCH NUMBER	S1 RESULT	S2 RESULT	UNIT	RELATIVE % DIFF
EPA Method 601						
Analyst ID	02.14.90	085	7314	7314	No.	0
Detection Limit	02.14.90	085	0.5	0.5	ug/L	0
Dilution Factor	02.14.90	085	1	1	Times	0
1,1,1-Trichloroethane	02.14.90	085	12	12	ug/L	0
1,1-Dichloroethane	02.14.90	085	12	12	ug/L	0
1,1-Dichloroethene	02.14.90	085	8.4	8.8	ug/L	5
1,2-Dichloroethane	02.14.90	085	14	15	ug/L	7
1,2-Dichloropropane	02.14.90	085	12	13	ug/L	8
Bromodichloromethane	02.14.90	085	12	13	ug/L	8
Bromoform	02.14.90	085	9.0	9.8	ug/L	9
Carbon Tetrachloride	02.14.90	085	12	12	ug/L	0
Chloroform	02.14.90	085	11	12	ug/L	9
Dibromochloromethane	02.14.90	085	11	12	ug/L	9
Methylene chloride	02.14.90	085	10	11	ug/L	10
Trichloroethene	02.14.90	085	12	12	ug/L	0
Tetrachloroethene	02.14.90	085	12	12	ug/L	0

BC ANALYTICAL

BATCH QC REPORT
ORDER E9002041

DATE REPORTED : 03/06/90

MATRIX QC ACCURACY (SPIKES)

PARAMETER	DATE ANALYZED	BATCH NUMBER	SBAR RESULT	TRUE VALUE	UNIT	PERCENT RECOVERY
EPA Method 601						
1,1,1-Trichloroethane	02.14.90	085	12	12	ug/L	100
1,1-Dichloroethane	02.14.90	085	12	12	ug/L	100
1,1-Dichloroethene	02.14.90	085	8.6	12	ug/L	72
1,2-Dichloroethane	02.14.90	085	14.5	12	ug/L	121
1,2-Dichloropropane	02.14.90	085	12.5	12	ug/L	104
Bromodichloromethane	02.14.90	085	12.5	12	ug/L	104
Bromoform	02.14.90	085	9.4	12	ug/L	78
Carbon Tetrachloride	02.14.90	085	12	12	ug/L	100
Chloroform	02.14.90	085	11.5	12	ug/L	96
Dibromochloromethane	02.14.90	085	11.5	12	ug/L	96
Methylene chloride	02.14.90	085	10.5	12	ug/L	88
Trichloroethene	02.14.90	085	12	12	ug/L	100
Tetrachloroethene	02.14.90	085	12	12	ug/L	100

BC ANALYTICAL

BATCH QC REPORT
ORDER E9002041

DATE REPORTED : 03/06/90

METHOD BLANKS AND REPORTING DETECTION LIMIT (RDL)

PARAMETER	DATE ANALYZED	BATCH NUMBER	BLANK RESULT	RDL	UNIT
EPA Method 601					
Date Analyzed	02.13.90	085	02.13.90	NA	Date
Time Analyzed	02.13.90	085	7314	NA	Hours
Analyst ID	02.13.90	085	516-21	NA	No.
Detection Limit	02.13.90	085	1	99999	ug/L
Dilution Factor	02.13.90	085	0	NA	Times
Instrument ID	02.13.90	085	0.5	NA	No.
1,1,1-Trichloroethane	02.13.90	085	0	0.5	ug/L
1,1,2,2-Tetrachloroethane	02.13.90	085	0	0.5	ug/L
1,1,2-Trichloroethane	02.13.90	085	0	0.5	ug/L
1,1-Dichloroethane	02.13.90	085	0	0.5	ug/L
1,1-Dichloroethene	02.13.90	085	0	0.5	ug/L
1,2-Dichloroethane	02.13.90	085	0	0.5	ug/L
1,2-Dichlorobenzene	02.13.90	085	0	0.5	ug/L
1,2-Dichloroethene (Total)	02.13.90	085	0	0.5	ug/L
1,2-Dichloropropane	02.13.90	085	0	0.5	ug/L
1,3-Dichlorobenzene	02.13.90	085	0	0.5	ug/L
1,4-Dichlorobenzene	02.13.90	085	0	0.5	ug/L
2-Chloroethylvinylether	02.13.90	085	0	0.5	ug/L
Bromodichloromethane	02.13.90	085	0	0.5	ug/L
Bromomethane	02.13.90	085	0	0.5	ug/L
Bromoform	02.13.90	085	0	0.5	ug/L
Chlorobenzene	02.13.90	085	0	0.5	ug/L
Carbon Tetrachloride	02.13.90	085	0	0.5	ug/L
Chloroethane	02.13.90	085	0	0.5	ug/L
Chloroform	02.13.90	085	0	0.5	ug/L
Chloromethane	02.13.90	085	0	0.5	ug/L
Dibromochloromethane	02.13.90	085	0	0.5	ug/L
Dichlorodifluoromethane	02.13.90	085	0	0.5	ug/L
Freon 113	02.13.90	085	0	0.5	ug/L
Methylene chloride	02.13.90	085	0.484	0.5	ug/L
Trichloroethene	02.13.90	085	0	0.5	ug/L
Trichlorofluoromethane	02.13.90	085	0	0.5	ug/L
Tetrachloroethene	02.13.90	085	0	0.5	ug/L
Vinyl chloride	02.13.90	085	0	0.5	ug/L
cis-1,2-Dichloroethene	02.13.90	085	0	0.5	ug/L
cis-1,3-Dichloropropene	02.13.90	085	0	0.5	ug/L
trans-1,2-Dichloroethene	02.13.90	085	0	0.5	ug/L

BC ANALYTICAL

BATCH QC REPORT
ORDER E9002041

DATE REPORTED : 03/06/90

METHOD BLANKS AND REPORTING DETECTION LIMIT (RDL)

PARAMETER	DATE ANALYZED	BATCH NUMBER	BLANK RESULT	RDL	UNIT
trans-1,3-Dichloropropene	02.13.90	085	0	0.5	ug/L

: ORDER PLACED FOR CLIENT: UC Lawrence Livermore National Lab 9002041 :
: BC ANALYTICAL : EMVL LAB : 11:27:38 06 MAR 1990 - P. 1 :

SAMPLES...	SAMPLE DESCRIPTION..	DETERM CODE....	DATE.... ANALYZED	METHOD.....	EQUIP.	ID.NO
9002041*1	W-834-D3	601.UCLL	02.14.90	601	516-21	7314

***

Notes: Equipment = BC Analytical identification number for a particular piece of analytical equipment.

ID.NO = BC Analytical employee identification number of analyst.

ECG # 900364/

00766

GEOMATRIX CONSULTANTS

ONE MARKET PLAZA
SPEAR STREET TOWER SUITE 717
SAN FRANCISCO, CALIFORNIA 94105
(415) 957-9557

Chain of Custody Record

DATE 3-1-90 PAGE 1 OF 1

PROJECT NO. 1459C

SAMPLERS: (SIGNATURE) Chen Young

DATE	TIME	SAMPLE NUMBER	GENERAL MINERAL	PRIORITY POLLUTANT METALS	EPA METHOD 624	EPA METHOD 625	EPA METHOD 601	EPA METHOD 602	EPA METHOD 608	PETROLEUM HYDROCARBONS	Mineral Spirits, BTXE				NUMBER OF CONTAINERS	REMARKS
3-1	9:45	B-12-5.0									X				1	
	9:55	B-12-15.0													1	HOLD
	10:20	B-13-5.0									X				1	
	10:20	B-13-15.0													1	HOLD
	10:45	B-14-6.5									X				1	
	11:35	B-15-13.5													1	HOLD
	11:45	B-15-17.5									X				1	
	12:10	B-16-5.5									X				1	
	12:20	B-17-5.5									X				1	
	1:50	B-18-6.0									X				1	HOLD
↓	2:15	B-19-5.5									X				1	

All soil samples cooled to 4° C

Results to Chen Young by 3:30 3/2/90
FAX # 596-6832

TOTAL NUMBER OF CONTAINERS 11

RELINQUISHED BY:	DATE	RECEIVED BY:	RELINQUISHED BY:	DATE	RECEIVED BY: (LAB)
SIGNATURE		SIGNATURE	SIGNATURE Chen Young	3/1	SIGNATURE
PRINTED NAME	TIME	PRINTED NAME	PRINTED NAME CHEN YOUNG	TIME 5:00	PRINTED NAME
COMPANY		COMPANY	COMPANY GEOMATRIX		LABORATORY ECG
RELINQUISHED BY:	DATE	RECEIVED BY:	METHOD OF SHIPMENT: Hand delivery		
SIGNATURE		SIGNATURE	LABORATORY COMMENTS / OBSERVATIONS		
PRINTED NAME	TIME	PRINTED NAME			
COMPANY		COMPANY			

DISTRIBUTION: WHITE, CANARY - LABORATORY, PINK - ORIGINATOR

Analytical Report

LOG NO: E90-03-066

Received: 02 MAR 90
Reported: 06 MAR 90

Ms. Cheri Young
Geomatrix Consultants
1 Market Plaza, Spear Tower, Ste.717
San Francisco, California 94105

Project: 1459C

REPORT OF ANALYTICAL RESULTS

LOG NO	SAMPLE DESCRIPTION, SOIL SAMPLES	DATE SAMPLED
03-066-1	MB-6-8.5	02 MAR 90
03-066-2	MB-6-15.0	02 MAR 90

PARAMETER	03-066-1	03-066-2
TPH-Volatile Hydrocarbons/BTEX		
Date Analyzed	03.02.90	03.02.90
Dilution Factor, Times	1	1
Benzene, mg/kg	<0.3	<0.3
Ethylbenzene, mg/kg	<0.3	<0.3
Toluene, mg/kg	<0.3	<0.3
Total Xylene Isomers, mg/kg	<0.3	<0.3
C4 to C12 Hydrocarbons, mg/kg	<10	<10
Other TPH-Volatile Hydrocarbons/BTEX	---	---

Sim D. Lessley, Ph.D., Laboratory Director

1255 Powell Street
Emeryville, CA 94608

415/428-2300
Fax: 415/547-3643

BCA *B C Analytical*

BROWN AND CALDWELL ANALYTICAL LABORATORIES

BATCH QC REPORT
Definitions and Terms

Accuracy: The ability of a procedure to determine the "true" concentration of an analyte.

Batch: A group of samples analyzed sequentially using the same calibration curve, reagents, and instrument.

Laboratory Control Standard (LCS): Laboratory reagent water spiked with known compounds and subjected to the same procedures as the samples. The LCS thus indicates the accuracy of the analytical method and, because it is prepared from a different source than the standard used to calibrate the instrument, it also serves to double-check the calibration.

LC Result: Laboratory result of an LCS analysis.

LT Result: Expected result, or true value, of the LCS analysis.

Matrix QC: Quality control tests performed on actual client samples. For most inorganic analyses, the laboratory uses a pair of duplicate samples and a spiked sample. For most organic analyses, the laboratory uses a pair of spiked samples (duplicate spikes).

Percent Recovery: The percentage of analyte recovered.
For LCS, the percent recovery calculation is

$$LC \div LT \times 100.$$

For spike recoveries, the percent recovery calculatiion is

$$\frac{(\text{S Bar} - \text{Sample Concentration})}{\text{Spike Amount}} \times 100$$

Precision: The reproducibility of a procedure demonstrated by the agreement between analyses performed on either duplicates of the same sample or a pair of duplicate spikes.

R1, R2 Result: Result of the analysis of replicate aliquots of a sample, with R1 indicating the first analysis of the sample and R2 its corresponding duplicate; used to determine precision.

Relative Percent Difference (RPD): Calculated using one of the following:

$$\frac{(R1 - R2) \times 100}{(R1 + R2) \div 2} \qquad \frac{(S1 - S2) \times 100}{(S1 + S2) \div 2}$$

S Bar Result: The average of spike analysis results.

S1, S2 Result: Result of the analysis of replicate spiked aliquots, with S1 indicating one spike of the sample and S2 the second spike; used to determine precision and accuracy.

True value: The theoretical, or expected, result of a spike sample analysis.

BC ANALYTICAL

BATCH QC REPORT
ORDER E9003066

DATE REPORTED : 03/07/90

LABORATORY CONTROL STANDARDS

PARAMETER	DATE ANALYZED	BATCH NUMBER	LC RESULT	LT RESULT	UNIT	PERCENT RECOVERY
TPH-Volatile Hydrocarbons/BTEX						
Dilution Factor	03.02.90	55	1	1	Times	100
Benzene	03.02.90	55	84.8	100	ug/L	85
Ethylbenzene	03.02.90	55	84.9	100	ug/L	85
Toluene	03.02.90	55	91.1	100	ug/L	91
Total Xylene Isomers	03.02.90	55	186	200	ug/L	93
C4 to C12 Hydrocarbons	03.02.90	55	953	1023	ug/L	93

BC ANALYTICAL

BATCH QC REPORT
ORDER E9003066

DATE REPORTED : 03/07/90

MATRIX QC PRECISION (DUPLICATE SPIKES)

PARAMETER	DATE ANALYZED	BATCH NUMBER	S1 RESULT	S2 RESULT	UNIT	RELATIVE % DIFF
TPH-Volatile Hydrocarbons/BTEX						
Dilution Factor	03.02.90	55	1	1	Times	0
Benzene	03.02.90	55	3.30	3.41	mg/kg	3
Ethylbenzene	03.02.90	55	3.33	3.48	mg/kg	4
Toluene	03.02.90	55	3.28	3.42	mg/kg	4
Total Xylene Isomers	03.02.90	55	7.37	7.73	mg/kg	5
C4 to C12 Hydrocarbons	03.02.90	55	43.4	43.6	mg/kg	0

BC ANALYTICAL

BATCH QC REPORT
ORDER E9003066

DATE REPORTED : 03/07/90

MATRIX QC ACCURACY (SPIKES)

PARAMETER	DATE ANALYZED	BATCH NUMBER	SBAR RESULT	TRUE VALUE	UNIT	PERCENT RECOVERY
TPH-Volatile Hydrocarbons/BTEX						
Benzene	03.02.90	55	3.355	4.82	mg/kg	70
Ethylbenzene	03.02.90	55	3.405	4.82	mg/kg	71
Toluene	03.02.90	55	3.35	4.82	mg/kg	70
Total Xylene Isomers	03.02.90	55	7.55	9.65	mg/kg	78
C4 to C12 Hydrocarbons	03.02.90	55	43.5	49.4	mg/kg	88

: ORDER PLACED FOR CLIENT: Geomatrix Consultants 9003066 :
: BC ANALYTICAL : EMVL LAB : 16:10:51 08 MAR 1990 - P. 1 :

SAMPLES...	SAMPLE DESCRIPTION..	DETERM CODE....	DATE.... ANALYZED	METHOD.....	EQUIP.	ID.NO
9003066*1	MB-6-8.5	GASOLINE.5030.BTEX	03.02.90	5030/8015	516-19	6366
9003066*2	MB-6-15.0	GASOLINE.5030.BTEX	03.02.90	5030/8015	516-19	6366

***

Notes: Equipment = BC Analytical identification number for a particular piece of analytical equipment.

ID.NO = BC Analytical employee identification number of analyst.

GEOMATRIX CONSULTANTS
ONE MARKET PLAZA
SPEAR STREET TOWER SUITE 717
SAN FRANCISCO, CALIFORNIA 94105
(415) 957-9557

Chain of Custody Record

0645

DATE 3/2/90 PAGE 1 OF 1

PROJECT NO. 1459C

SAMPLERS: (SIGNATURE) Cheri Young

DATE	TIME	SAMPLE NUMBER	GENERAL MINERAL	PRIORITY POLLUTANT METALS	EPA METHOD 624	EPA METHOD 625	EPA METHOD 601	EPA METHOD 602	EPA METHOD 608	PETROLEUM HYDROCARBONS Mineral Spirits BTXE					NUMBER OF CONTAINERS
3/2	8:40	MB-6-8.5								X					1
3/2	11:50	MB-6-15.0								X					1

ANALYSES

REMARKS (SAMPLE PRESERVATION, HANDLING PROCEDURES, OBSERVATIONS, ETC.)

} Soil samples cooled to 4°C

24 hr turnaround

Results to Cheri Young
FAX: Geomatrix of field trailer

RUSH

TOTAL NUMBER OF CONTAINERS 2

RELINQUISHED BY:	DATE	RECEIVED BY:	RELINQUISHED BY:	DATE	RECEIVED BY: (LAB)
SIGNATURE		SIGNATURE	SIGNATURE Cheri Young	3/2	SIGNATURE
PRINTED NAME	TIME	PRINTED NAME	PRINTED NAME CHERI YOUNG	TIME 12:45	PRINTED NAME
COMPANY		COMPANY	COMPANY GEOMATRIX		LABORATORY

RELINQUISHED BY:	DATE	RECEIVED BY:
SIGNATURE		SIGNATURE
PRINTED NAME	TIME	PRINTED NAME
COMPANY		COMPANY

METHOD OF SHIPMENT: hand delivery

LABORATORY COMMENTS / OBSERVATIONS

Log # 9003066

DISTRIBUTION: WHITE, CANARY - LABORATORY, PINK - ORIGINATOR

Analytical Report

LOG NO: E90-03-454

Received: 12 MAR 90
Reported: 14 MAR 90

Ms. Cheri Young
Geomatrix Consultants
1 Market Plaza, Spear Tower, Ste.717
San Francisco, California 94105

Project: 1459E

REPORT OF ANALYTICAL RESULTS

LOG NO	SAMPLE DESCRIPTION, SOIL SAMPLES	DATE SAMPLED
03-454-1	B-20-10.5	12 MAR 90
03-454-2	B-21-14.0	12 MAR 90
03-454-3	B-21-2.0	12 MAR 90
03-454-4	B-22-6.0	12 MAR 90
03-454-5	B-20-25.5	12 MAR 90

PARAMETER	03-454-1	03-454-2	03-454-3	03-454-4	03-454-5
Sample Held, Not Analyzed	---	---	---	---	HELD
TPH-Volatile Hydrocarbons/BTEX					
Date Analyzed	03.13.90	03.13.90	03.13.90	03.13.90	---
Dilution Factor, Times	1	1	1	1	---
Benzene, mg/kg	<0.3	<0.3	<0.3	<0.3	---
Ethylbenzene, mg/kg	<0.3	<0.3	<0.3	<0.3	---
Toluene, mg/kg	<0.3	<0.3	<0.3	<0.3	---
Total Xylene Isomers, mg/kg	<0.3	<0.3	0.3	<0.3	---
C4 to C12 Hydrocarbons, mg/kg	<10	<10	33	<10	---
Fuel Characterization, .	---	---	MIN.SPIRIT	---	---

This Fuel characterization is a qualitative identification based upon a visual comparison of sample chromatograms with those from authentic standards.

Sim D. Lessley, Ph.D. / Laboratory Director

1255 Powell Street
Emeryville, CA 94608

415/428-2300
Fax: 415/547-3643

BCA B C Analytical

BROWN AND CALDWELL ANALYTICAL LABORATORIES

BATCH QC REPORT
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LC Result:	Laboratory result of an LCS analysis.
LT Result:	Expected result, or true value, of the LCS analysis.
Matrix QC:	Quality control tests performed on actual client samples. For most inorganic analyses, the laboratory uses a pair of duplicate samples and a spiked sample. For most organic analyses, the laboratory uses a pair of spiked samples (duplicate spikes).
Percent Recovery:	The percentage of analyte recovered. For LCS, the percent recovery calculation is $LC \div LT \times 100.$ For spike recoveries, the percent recovery calculatiion is $\frac{(S\ Bar - Sample\ Concentration)}{Spike\ Amount} \times 100$
Precision:	The reproducibility of a procedure demonstrated by the agreement between analyses performed on either duplicates of the same sample or a pair of duplicate spikes.
R1, R2 Result:	Result of the analysis of replicate aliquots of a sample, with R1 indicating the first analysis of the sample and R2 its corresponding duplicate; used to determine precision.
Relative Percent Difference (RPD):	Calculated using one of the following: $\frac{(R1 - R2) \times 100}{(R1 + R2) \div 2}$ $\frac{(S1 - S2) \times 100}{(S1 + S2) \div 2}$
S Bar Result:	The average of spike analysis results.
S1, S2 Result:	Result of the analysis of replicate spiked aliquots, with S1 indicating one spike of the sample and S2 the second spike; used to determine precision and accuracy.
True value:	The theoretical, or expected, result of a spike sample analysis.

BC ANALYTICAL

BATCH QC REPORT
ORDER E9003454

DATE REPORTED : 03/19/90

LABORATORY CONTROL STANDARDS

PARAMETER	DATE ANALYZED	BATCH NUMBER	LC RESULT	LT RESULT	UNIT	PERCENT RECOVERY
TPH-Volatile Hydrocarbons/BTEX						
Dilution Factor	03.13.90	73	1	1	Times	100
Benzene	03.13.90	73	4.8	5	mg/kg	96
Ethylbenzene	03.13.90	73	4.9	5	mg/kg	98
Toluene	03.13.90	73	4.9	5	mg/kg	98
Total Xylene Isomers	03.13.90	73	11	10	mg/kg	110
C4 to C12 Hydrocarbons	03.13.90	73	47	50	mg/kg	94
TPH-Volatile Hydrocarbons/BTEX						
Dilution Factor	03.13.90	73	1	1	Times	100
Benzene	03.13.90	73	4.8	5	mg/kg	96
Ethylbenzene	03.13.90	73	4.9	5	mg/kg	98
Toluene	03.13.90	73	4.9	5	mg/kg	98
Total Xylene Isomers	03.13.90	73	11	10	mg/kg	110
C4 to C12 Hydrocarbons	03.13.90	73	47	50	mg/kg	94

BC ANALYTICAL

BATCH QC REPORT
ORDER E9003454

DATE REPORTED : 03/19/90

MATRIX QC PRECISION (DUPLICATE SPIKES)

PARAMETER	DATE ANALYZED	BATCH NUMBER	S1 RESULT	S2 RESULT	UNIT	RELATIVE % DIFF
TPH-Volatile Hydrocarbons/BTEX						
Dilution Factor	03.13.90	73	1	1	Times	0
Benzene	03.13.90	73	4.2	3.7	mg/kg	13
Ethylbenzene	03.13.90	73	4.5	4.2	mg/kg	7
Toluene	03.13.90	73	4.3	3.9	mg/kg	10
Total Xylene Isomers	03.13.90	73	10	9.4	mg/kg	6
C4 to C12 Hydrocarbons	03.13.90	73	48	47	mg/kg	2

BC ANALYTICAL

BATCH QC REPORT
ORDER E9003454

DATE REPORTED : 03/19/90

MATRIX QC ACCURACY (SPIKES)

PARAMETER	DATE ANALYZED	BATCH NUMBER	SBAR RESULT	TRUE VALUE	UNIT	PERCENT RECOVERY
PH-Volatile Hydrocarbons/BTEX						
Benzene	03.13.90	73	3.95	4.8	mg/kg	82
Ethylbenzene	03.13.90	73	4.35	4.8	mg/kg	91
Toluene	03.13.90	73	4.1	4.8	mg/kg	85
Total Xylene Isomers	03.13.90	73	9.7	9.8	mg/kg	99
C4 to C12 Hydrocarbons	03.13.90	73	47.5	48	mg/kg	99

BC ANALYTICAL

BATCH QC REPORT
ORDER E9003454

DATE REPORTED : 03/19/90

METHOD BLANKS AND REPORTING DETECTION LIMIT (RDL)

PARAMETER	DATE ANALYZED	BATCH NUMBER	BLANK RESULT	RDL	UNIT
TPH-Volatile Hydrocarbons/BTEX					
Date Analyzed	03.13.90	73	03.13.90	NA	Date
Dilution Factor	03.13.90	73	1	NA	Times
Benzene	03.13.90	73	0.018	0.1	mg/kg
Ethylbenzene	03.13.90	73	0.045	0.1	mg/kg
Toluene	03.13.90	73	0.031	0.1	mg/kg
Total Xylene Isomers	03.13.90	73	0.14	0.1	mg/kg
C4 to C12 Hydrocarbons	03.13.90	73	0.64	5	mg/kg

: ORDER PLACED FOR CLIENT: Geomatrix Consultants 9003454 :
: BC ANALYTICAL : EMVL LAB : 12:51:23 19 MAR 1990 - P. 1 :

SAMPLES...	SAMPLE DESCRIPTION..	DETERM CODE....	DATE.... ANALYZED	METHOD.....	EQUIP.	ID.NO
9003454*1	B-20-10.5	GASOLINE.5030.BTEX	03.13.90	5030/8015	516-19	7194
9003454*2	B-21-14.0	GASOLINE.5030.BTEX	03.13.90	5030/8015	516-19	7194
9003454*3	B-21-2.0	GASOLINE.5030.BTEX	03.13.90	5030/8015	516-19	7194
9003454*4	B-22-6.0	GASOLINE.5030.BTEX	03.13.90	5030/8015	516-19	7194
9003454*5	B-20-25.5	HOLD	03.13.90			7505

***

Notes: Equipment = BC Analytical identification number for a particular piece of analytical equipment.

ID.NO = BC Analytical employee identification number of analyst.

: ORDER PLACED FOR CLIENT: Geomatrix Consultants 9003454 :
: BC ANALYTICAL : EMVL LAB : 10:50:27 15 MAR 1990 - P. 1 :

SAMPLES...	SAMPLE DESCRIPTION..	DETERM CODE....	DATE.... ANALYZED	METHOD.....	EQUIP.	ID.NO
9003454*1	B-20-10.5	GASOLINE.5030.BTEX	03.13.90	5030/8015	516-19	7194
9003454*2	B-21-14.0	GASOLINE.5030.BTEX	03.13.90	5030/8015	516-19	7194
9003454*3	B-21-2.0	GASOLINE.5030.BTEX	03.13.90	5030/8015	516-19	7194
9003454*4	B-22-6.0	GASOLINE.5030.BTEX	03.13.90	5030/8015	516-19	7194
9003454*5	B-20-25.5	HOLD	03.13.90			7505

***

Notes: Equipment = BC Analytical identification number for a particular piece of analytical equipment.

ID.NO = BC Analytical employee identification number of analyst.

GEOMATRIX CONSULTANTS
ONE MARKET PLAZA
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00867

Chain of Custody Record

DATE 3/12/90 PAGE 1 OF 1

PROJECT NO. 1459E

SAMPLERS: (SIGNATURE) Cheri Young

DATE	TIME	SAMPLE NUMBER	GENERAL MINERAL	PRIORITY POLLUTANT METALS	EPA METHOD 624	EPA METHOD 625	EPA METHOD 601	EPA METHOD 602	EPA METHOD 608	PETROLEUM HYDROCARBONS	Mineral Spirits, BTXE				NUMBER OF CONTAINERS
3/12	10:50	B-20-10.5	1								X				1
3/12	12:05	B-20-25.5									X				1
3/12	2:00	B-21-14.0	2								X				1
3/12	2:50	B-21-2.0	3								X				1
3/12	3:50	B-22-6.0	4								X				1

ANALYSES

REMARKS (SAMPLE PRESERVATION, HANDLING PROCEDURES, OBSERVATIONS, ETC.)

HOLD

All soil samples cooled on ice

24 hr turnaround

Results to Cheri Young

FAX TO OFFICE

E9003454

TOTAL NUMBER OF CONTAINERS 5

RELINQUISHED BY:	DATE	RECEIVED BY:	RELINQUISHED BY:	DATE	RECEIVED BY: (LAB)
SIGNATURE		SIGNATURE	SIGNATURE CHERI YOUNG	3/12	SIGNATURE CHIKAN Ho
PRINTED NAME	TIME	PRINTED NAME	PRINTED NAME GEOMATRIX	TIME 5.10	PRINTED NAME RCA
COMPANY		COMPANY	COMPANY		LABORATORY
RELINQUISHED BY:	DATE	RECEIVED BY:	METHOD OF SHIPMENT: hand delivery		
SIGNATURE		SIGNATURE	LABORATORY COMMENTS / OBSERVATIONS		
PRINTED NAME	TIME	PRINTED NAME			
COMPANY		COMPANY			

DISTRIBUTION: WHITE, CANARY - LABORATORY, PINK - ORIGINATOR

Analytical Report

LOG NO: E90-03-482

Received: 13 MAR 90
Reported: 14 MAR 90

Ms. Cheri Young
Geomatrix Consultants
1 Market Plaza, Spear Tower, Ste.717
San Francisco, California 94105

Project: 1459E

REPORT OF ANALYTICAL RESULTS

LOG NO	SAMPLE DESCRIPTION, SOIL SAMPLES	DATE SAMPLED
03-482-1	B-23-6.0	13 MAR 90
03-482-2	B-24-31.0	13 MAR 90
03-482-3	B-24-6.0	13 MAR 90
03-482-4	B-22-16.0	13 MAR 90

PARAMETER	03-482-1	03-482-2	03-482-3	03-482-4
Sample Held, Not Analyzed	---	---	---	HELD
TPH-Volatile Hydrocarbons/BTEX				
Date Analyzed	03.13.90	03.13.90	03.13.90	---
Dilution Factor, Times	1	1	1	---
Benzene, mg/kg	<0.3	<0.3	<0.3	---
Ethylbenzene, mg/kg	<0.3	<0.3	<0.3	---
Toluene, mg/kg	<0.3	<0.3	<0.3	---
Total Xylene Isomers, mg/kg	<0.3	<0.3	<0.3	---
C4 to C12 Hydrocarbons, mg/kg	<10	<10	<10	---
Other TPH-Volatile Hydrocarbons/BTEX	---	---	---	---

Sim D. Lessley, Ph.D., Laboratory Director

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Emeryville, CA 94608

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Fax: 415/547-3643

BCA B C Analytical

BROWN AND CALDWELL ANALYTICAL LABORATORIES

BATCH QC REPORT
Definitions and Terms

Accuracy:	The ability of a procedure to determine the "true" concentration of an analyte.
Batch:	A group of samples analyzed sequentially using the same calibration curve, reagents, and instrument.
Laboratory Control Standard (LCS):	Laboratory reagent water spiked with known compounds and subjected to the same procedures as the samples. The LCS thus indicates the accuracy of the analytical method and, because it is prepared from a different source than the standard used to calibrate the instrument, it also serves to double-check the calibration.
LC Result:	Laboratory result of an LCS analysis.
LT Result:	Expected result, or true value, of the LCS analysis.
Matrix QC:	Quality control tests performed on actual client samples. For most inorganic analyses, the laboratory uses a pair of duplicate samples and a spiked sample. For most organic analyses, the laboratory uses a pair of spiked samples (duplicate spikes).
Percent Recovery:	The percentage of analyte recovered. For LCS, the percent recovery calculation is $LC \div LT \times 100.$ For spike recoveries, the percent recovery calculatiion is $\frac{(S\ Bar - Sample\ Concentration)}{Spike\ Amount} \times 100$
Precision:	The reproducibility of a procedure demonstrated by the agreement between analyses performed on either duplicates of the same sample or a pair of duplicate spikes.
R1, R2 Result:	Result of the analysis of replicate aliquots of a sample, with R1 indicating the first analysis of the sample and R2 its corresponding duplicate; used to determine precision.
Relative Percent Difference (RPD):	Calculated using one of the following: $\frac{(R1 - R2) \times 100}{(R1 + R2) \div 2}$ $\frac{(S1 - S2) \times 100}{(S1 + S2) \div 2}$
S Bar Result:	The average of spike analysis results.
S1, S2 Result:	Result of the analysis of replicate spiked aliquots, with S1 indicating one spike of the sample and S2 the second spike; used to determine precision and accuracy.
True value:	The theoretical, or expected, result of a spike sample analysis.

BC ANALYTICAL

BATCH QC REPORT
ORDER E9003482

DATE REPORTED : 03/19/90

MATRIX QC PRECISION (DUPLICATE SPIKES)

PARAMETER	DATE ANALYZED	BATCH NUMBER	S1 RESULT	S2 RESULT	UNIT	RELATIVE % DIFF
TPH-Volatile Hydrocarbons/BTEX						
Dilution Factor	03.13.90	73	1	1	Times	0
Benzene	03.13.90	73	4.2	3.7	mg/kg	13
Ethylbenzene	03.13.90	73	4.5	4.2	mg/kg	7
Toluene	03.13.90	73	4.3	3.9	mg/kg	10
Total Xylene Isomers	03.13.90	73	10	9.4	mg/kg	6
C4 to C12 Hydrocarbons	03.13.90	73	48	47	mg/kg	2

BC ANALYTICAL

BATCH QC REPORT
ORDER E9003482

DATE REPORTED : 03/19/90

MATRIX QC ACCURACY (SPIKES)

PARAMETER	DATE ANALYZED	BATCH NUMBER	SBAR RESULT	TRUE VALUE	UNIT	PERCENT RECOVERY
TPH-Volatile Hydrocarbons/BTEX						
Benzene	03.13.90	73	3.95	4.8	mg/kg	82
Ethylbenzene	03.13.90	73	4.35	4.8	mg/kg	91
Toluene	03.13.90	73	4.1	4.8	mg/kg	85
Total Xylene Isomers	03.13.90	73	9.7	9.8	mg/kg	99
C4 to C12 Hydrocarbons	03.13.90	73	47.5	48	mg/kg	99

BC ANALYTICAL

BATCH QC REPORT
ORDER E9003482

DATE REPORTED : 03/19/90

METHOD BLANKS AND REPORTING DETECTION LIMIT (RDL)

PARAMETER	DATE ANALYZED	BATCH NUMBER	BLANK RESULT	RDL	UNIT
TPH-Volatile Hydrocarbons/BTEX					
Date Analyzed	03.13.90	73	03.13.90	NA	Date
Dilution Factor	03.13.90	73	1	NA	Times
Benzene	03.13.90	73	0.018	0.1	mg/kg
Ethylbenzene	03.13.90	73	0.045	0.1	mg/kg
Toluene	03.13.90	73	0.031	0.1	mg/kg
Total Xylene Isomers	03.13.90	73	0.14	0.1	mg/kg
C4 to C12 Hydrocarbons	03.13.90	73	0.64	5	mg/kg

: ORDER PLACED FOR CLIENT: Geomatrix Consultants 9003482 :
: BC ANALYTICAL : EMVL LAB : 12:26:02 19 MAR 1990 - P. 1 :

SAMPLES...	SAMPLE DESCRIPTION..	DETERM CODE....	DATE.... ANALYZED	METHOD.....	EQUIP.	ID.NO
9003482*1	B-23-6.0	GASOLINE.5030.BTEX	03.13.90	5030/8015	516-19	7194
9003482*2	B-24-31.0	GASOLINE.5030.BTEX	03.13.90	5030/8015	516-19	7194
9003482*3	B-24-6.0	GASOLINE.5030.BTEX	03.13.90	5030/8015	516-19	7194
9003482*4	B-22-16.0	HOLD	03.14.90			6926

***

Notes: Equipment = BC Analytical identification number for a particular piece of analytical equipment.

ID.NO = BC Analytical employee identification number of analyst.

BC ANALYTICAL

BATCH QC REPORT
ORDER E9003482

DATE REPORTED : 03/19/90

LABORATORY CONTROL STANDARDS

PARAMETER	DATE ANALYZED	BATCH NUMBER	LC RESULT	LT RESULT	UNIT	PERCENT RECOVERY
TPH-Volatile Hydrocarbons/BTEX						
Dilution Factor	03.13.90	73	1	1	Times	100
Benzene	03.13.90	73	4.8	5	mg/kg	96
Ethylbenzene	03.13.90	73	4.9	5	mg/kg	98
Toluene	03.13.90	73	4.9	5	mg/kg	98
Total Xylene Isomers	03.13.90	73	11	10	mg/kg	110
C4 to C12 Hydrocarbons	03.13.90	73	47	50	mg/kg	94
TPH-Volatile Hydrocarbons/BTEX						
Dilution Factor	03.13.90	73	1	1	Times	100
Benzene	03.13.90	73	4.8	5	mg/kg	96
Ethylbenzene	03.13.90	73	4.9	5	mg/kg	98
Toluene	03.13.90	73	4.9	5	mg/kg	98
Total Xylene Isomers	03.13.90	73	11	10	mg/kg	110
C4 to C12 Hydrocarbons	03.13.90	73	47	50	mg/kg	94

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(415) 957-9557

00860

Chain of Custody Record

DATE 3/13/90 PAGE 1 OF 1

PROJECT NO. 1459E

SAMPLERS: (SIGNATURE) Cheri Young

DATE	TIME	SAMPLE NUMBER	GENERAL MINERAL	PRIORITY POLLUTANT METALS	EPA METHOD 624	EPA METHOD 625	EPA METHOD 601	EPA METHOD 602	EPA METHOD 608	PETROLEUM HYDROCARBONS	Mineral Spirits, BTXE	8240	8270	CAM METALS		NUMBER OF CONTAINERS	REMARKS (SAMPLE PRESERVATION, HANDLING PROCEDURES, OBSERVATIONS, ETC.)
3/13	10:00	B-22-16.0														1	HOLD
3/13	11:40	B-23-6.0									X					1	All soil samples
3/13	1:45	B-24-6.0									X	X	X	X		1	cooled on ice
3/13	4:00	B-24-31.0									X					1	

Remarks: 3-483-1 = 8240 8270; 3-484 = CAM-TTLC

24 hr turnaround ON TPH

Results to Cheri Young

ASAP (48-96 hr) TAT for 8240/8270

Metals on STD 2 weeks.

E9003482

TOTAL NUMBER OF CONTAINERS: 4

RELINQUISHED BY:	DATE	RECEIVED BY:	RELINQUISHED BY:	DATE	RECEIVED BY: (LAB)
SIGNATURE		SIGNATURE	SIGNATURE: Cheri Young	3/13	SIGNATURE: Chihsan Ho
PRINTED NAME	TIME	PRINTED NAME	PRINTED NAME: CHERI YOUNG	TIME 5:20	PRINTED NAME: CHIHSAN HO
COMPANY		COMPANY	COMPANY: GEOMATRIX		LABORATORY: BCA

RELINQUISHED BY:	DATE	RECEIVED BY:
SIGNATURE		SIGNATURE
PRINTED NAME	TIME	PRINTED NAME
COMPANY		COMPANY

METHOD OF SHIPMENT: hand delivery

LABORATORY COMMENTS / OBSERVATIONS

DISTRIBUTION: WHITE, CANARY - LABORATORY, PINK - ORIGINATOR

Analytical Report

LOG NO: E90-03-483

Received: 13 MAR 90
Reported: 15 MAR 90

Ms. Cheri Young
Geomatrix Consultants
1 Market Plaza, Spear Tower, Ste.717
San Francisco, California 94105

Project: 1459E

REPORT OF ANALYTICAL RESULTS

LOG NO	SAMPLE DESCRIPTION, SOIL SAMPLES	DATE SAMPLED
03-483-1	B-24-6.0	13 MAR 90

PARAMETER	03-483-1
B/N,A Ext.Pri.Poll. (EPA-8270)	
Date Analyzed	03.15.90
Date Extracted	03.14.90
Dilution Factor, Times	1
1,2,4-Trichlorobenzene, mg/kg	<0.03
1,2-Dichlorobenzene, mg/kg	<0.03
1,2-Diphenylhydrazine, mg/kg	<0.03
1,3-Dichlorobenzene, mg/kg	<0.03
1,4-Dichlorobenzene, mg/kg	<0.03
2,4,5-Trichlorophenol, mg/kg	<0.03
2,4,6-Trichlorophenol, mg/kg	<0.03
2,4-Dichlorophenol, mg/kg	<0.03
2,4-Dimethylphenol, mg/kg	<0.03
2,4-Dinitrophenol, mg/kg	<0.3
2,4-Dinitrotoluene, mg/kg	<0.03
2,6-Dinitrotoluene, mg/kg	<0.03
2-Chloronaphthalene, mg/kg	<0.03
2-Chlorophenol, mg/kg	<0.03
2-Methyl-4,6-dinitrophenol, mg/kg	<0.03
2-Methylnaphthalene, mg/kg	<0.03
2-Methylphenol, mg/kg	<0.03
2-Nitroaniline, mg/kg	<0.2
2-Nitrophenol, mg/kg	<0.03
3,3'-Dichlorobenzidine, mg/kg	<0.03
3-Nitroaniline, mg/kg	<0.2
4-Bromophenylphenylether, mg/kg	<0.03
4-Chloro-3-methylphenol, mg/kg	<0.03

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Analytical Report

LOG NO: E90-03-483

Received: 13 MAR 90
Reported: 15 MAR 90

Ms. Cheri Young
Geomatrix Consultants
1 Market Plaza, Spear Tower, Ste.717
San Francisco, California 94105

Project: 1459E

REPORT OF ANALYTICAL RESULTS

LOG NO	SAMPLE DESCRIPTION, SOIL SAMPLES	DATE SAMPLED
03-483-1	B-24-6.0	13 MAR 90

PARAMETER	03-483-1
4-Chloroaniline, mg/kg	<0.2
4-Chlorophenylphenylether, mg/kg	<0.03
4-Methylphenol, mg/kg	<0.03
4-Nitroaniline, mg/kg	<0.2
4-Nitrophenol, mg/kg	<0.7
Acenaphthene, mg/kg	<0.03
Acenaphthylene, mg/kg	<0.03
Aniline, mg/kg	<0.03
Anthracene, mg/kg	<0.03
Benzidine, mg/kg	<1
Benzo(a)anthracene, mg/kg	<0.03
Benzo(a)pyrene, mg/kg	<0.03
Benzo(b)fluoranthene, mg/kg	<0.03
Benzo(g,h,i)perylene, mg/kg	<0.03
Benzo(k)fluoranthene, mg/kg	<0.03
Benzyl alcohol, mg/kg	<0.2
Benzoic acid, mg/kg	<0.2
Butylbenzylphthalate, mg/kg	<0.03
Chrysene, mg/kg	<0.03
Di-n-octylphthalate, mg/kg	<0.03
Dibenzo(a,h)anthracene, mg/kg	<0.03
Dibenzofuran, mg/kg	<0.03
Dibutylphthalate, mg/kg	<0.03
Diethylphthalate, mg/kg	<0.03
Dimethylphthalate, mg/kg	<0.03
Fluoranthene, mg/kg	<0.03
Fluorene, mg/kg	<0.03

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BCA B C Analytical

Analytical Report

LOG NO: E90-03-483

Received: 13 MAR 90
Reported: 15 MAR 90

Ms. Cheri Young
Geomatrix Consultants
1 Market Plaza, Spear Tower, Ste.717
San Francisco, California 94105

Project: 1459E

REPORT OF ANALYTICAL RESULTS

LOG NO	SAMPLE DESCRIPTION, SOIL SAMPLES	DATE SAMPLED
03-483-1	B-24-6.0	13 MAR 90

PARAMETER	03-483-1
Hexachlorobenzene, mg/kg	<0.03
Hexachlorobutadiene, mg/kg	<0.03
Hexachlorocyclopentadiene, mg/kg	<0.03
Indeno(1,2,3-c,d)pyrene, mg/kg	<0.03
Isophorone, mg/kg	<0.03
N-Nitrosodimethylamine, mg/kg	<0.03
N-Nitrosodiphenylamine, mg/kg	<0.03
N-Nitrosodi-n-propylamine, mg/kg	<0.03
Nitrobenzene, mg/kg	<0.03
Naphthalene, mg/kg	<0.03
Phenanthrene, mg/kg	<0.03
Phenol, mg/kg	<0.03
Pentachlorophenol, mg/kg	<0.03
Pyrene, mg/kg	<0.03
Bis(2-chloroethoxy)methane, mg/kg	<0.03
Bis(2-chloroethyl)ether, mg/kg	<0.03
Bis(2-chloroisopropyl)ether, mg/kg	<0.03
Bis(2-ethylhexyl)phthalate, mg/kg	<3
Other B/N,A Ext.Pri.Poll. (EPA-8270)	---

1255 Powell Street
Emeryville, CA 94608

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Fax: 415/547-3643

BCA *B C Analytical*

Analytical Report

LOG NO: E90-03-483

Received: 13 MAR 90
Reported: 15 MAR 90

Ms. Cheri Young
Geomatrix Consultants
1 Market Plaza, Spear Tower, Ste.717
San Francisco, California 94105

Project: 1459E

REPORT OF ANALYTICAL RESULTS

LOG NO	SAMPLE DESCRIPTION, SOIL SAMPLES	DATE SAMPLED
03-483-1	B-24-6.0	13 MAR 90

PARAMETER	03-483-1
Purgeable Priority Pollutants	
Date Extracted	03.14.90
1,1,1-Trichloroethane, mg/kg	<0.1
1,1,2,2-Tetrachloroethane, mg/kg	<0.1
1,1,2-Trichloroethane, mg/kg	<0.1
1,1-Dichloroethane, mg/kg	<0.1
1,1-Dichloroethene, mg/kg	<0.1
1,2-Dichloroethane, mg/kg	<0.1
1,2-Dichloropropane, mg/kg	<0.1
1,3-Dichloropropene, mg/kg	<0.1
2-Chloroethylvinylether, mg/kg	<0.1
2-Hexanone, mg/kg	<0.1
Acetone, mg/kg	<1
Acrolein, mg/kg	<1
Acrylonitrile, mg/kg	<1
Bromodichloromethane, mg/kg	<0.1
Bromomethane, mg/kg	<0.1
Benzene, mg/kg	<0.1
Bromoform, mg/kg	<0.1
Chlorobenzene, mg/kg	<0.1
Carbon Tetrachloride, mg/kg	<0.1
Chloroethane, mg/kg	<0.1
Chloroform, mg/kg	<0.1
Chloromethane, mg/kg	<0.1
Carbon Disulfide, mg/kg	<0.1
Dibromochloromethane, mg/kg	<0.1
Ethylbenzene, mg/kg	<0.1

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Emeryville, CA 94608

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BCA *B C Analytical*

Analytical Report

LOG NO: E90-03-483

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Reported: 15 MAR 90

Ms. Cheri Young
Geomatrix Consultants
1 Market Plaza, Spear Tower, Ste.717
San Francisco, California 94105

Project: 1459E

REPORT OF ANALYTICAL RESULTS

LOG NO	SAMPLE DESCRIPTION, SOIL SAMPLES	DATE SAMPLED
03-483-1	B-24-6.0	13 MAR 90

PARAMETER	03-483-1
Freon 113, mg/kg	<0.1
Methyl ethyl ketone, mg/kg	<2
Methyl isobutyl ketone, mg/kg	<0.1
Methylene chloride, mg/kg	<0.1
Styrene, mg/kg	<0.1
Trichloroethene, mg/kg	<0.1
Trichlorofluoromethane, mg/kg	<0.1
Toluene, mg/kg	<0.1
Tetrachloroethene, mg/kg	<0.1
Vinyl acetate, mg/kg	<0.1
Vinyl chloride, mg/kg	<0.1
Total Xylene Isomers, mg/kg	<0.1
cis-1,2-Dichloroethene, mg/kg	<0.1
trans-1,2-Dichloroethene, mg/kg	<0.1
trans-1,3-Dichloropropene, mg/kg	<0.1

Sim D. Lessley, Ph.D. / Laboratory Director

1255 Powell Street
Emeryville, CA 94608

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BCA B C Analytical

GEOMATRIX CONSULTANTS
ONE MARKET PLAZA
SPEAR STREET TOWER SUITE 717
SAN FRANCISCO, CALIFORNIA 94105
(415) 957-9557

00860

Chain of Custody Record

DATE 3/13/90 PAGE 1 OF 1

PROJECT NO. 1459E

SAMPLERS: (SIGNATURE)

DATE	TIME	SAMPLE NUMBER	GENERAL MINERAL	PRIORITY POLLUTANT METALS	EPA METHOD 624	EPA METHOD 625	EPA METHOD 601	EPA METHOD 602	EPA METHOD 608	PETROLEUM HYDROCARBONS	Mineral Spirits, BTXE	8240	8270	CAM METALS		NUMBER OF CONTAINERS
3/13	10.00	B-22-16.0									X					1
3/13	11:40	B-23-6.0									X					1
3/13	1.45	B-24-6.0									X	X	X	X		1
3/13	4.00	B-24-31.0									X					1

ANALYSES

REMARKS (SAMPLE PRESERVATION, HANDLING PROCEDURES, OBSERVATIONS, ETC.)

B-483-1 = 8240 8270

B-484 = [illegible]

HOLD All soil samples cooled on ice

24 hr turnaround ON TPH

Results to Chris Young

ASAP (48-96 hr) TAT for 8240/8270 Methods on STD 2 weeks.

E9003482

TOTAL NUMBER OF CONTAINERS 4

RELINQUISHED BY:	DATE	RECEIVED BY:
SIGNATURE		SIGNATURE
PRINTED NAME	TIME	PRINTED NAME
COMPANY		COMPANY
RELINQUISHED BY:	DATE	RECEIVED BY:
SIGNATURE		SIGNATURE
PRINTED NAME	TIME	PRINTED NAME
COMPANY		COMPANY

RELINQUISHED BY:	DATE	RECEIVED BY: (LAB)
Chris Young	3/13	[illegible] HO
SIGNATURE	TIME	SIGNATURE
CHRIS YOUNG	5:20	CHUCK AN HO
PRINTED NAME		PRINTED NAME
GEOMATRIX		BC Lab
COMPANY		LABORATORY

METHOD OF SHIPMENT: hand delivery

LABORATORY COMMENTS / OBSERVATIONS

DISTRIBUTION: WHITE, CANARY - LABORATORY, PINK - ORIGINATOR

Analytical Report

LOG NO: E90-03-484

Received: 13 MAR 90
Reported: 03 APR 90

Ms. Cheri Young
Geomatrix Consultants
1 Market Plaza, Spear Tower, Ste.717
San Francisco, California 94105

Project: 1459E

REPORT OF ANALYTICAL RESULTS

LOG NO	SAMPLE DESCRIPTION, SOIL SAMPLES	DATE SAMPLED
03-484-1	B-24-6.0	13 MAR 90

PARAMETER	03-484-1
Fourteen CAM Metals by ICAP EPA METHOD 6010 (c)	
Silver, mg/kg	<0.4
Barium, mg/kg	76
Beryllium, mg/kg	<0.2
Cadmium, mg/kg	6.2
Cobalt, mg/kg	12
Chromium, mg/kg	67
Copper, mg/kg	40
Molybdenum, mg/kg	<2
Nickel, mg/kg	89
Lead, mg/kg	<6
Antimony, mg/kg	<1
Thallium, mg/kg	<4
Vanadium, mg/kg	54
Zinc, mg/kg	61
Arsenic, mg/kg EPA METHOD 7060 (c)	0.7
Mercury, mg/kg EPA METHOD 7471 (c)	0.04
Selenium, mg/kg EPA METHOD 7740 (c)	<0.4
CAM Digestions, Date	03.27.90

Hedy J. Ficklin for
Sim D. Lessley, Ph.D., Laboratory Director

1255 Powell Street
Emeryville, CA 94608

415/428-2300
Fax: 415/547-3643

BCA B C Analytical

BROWN AND CALDWELL ANALYTICAL LABORATORIES

BATCH QC REPORT
Definitions and Terms

Accuracy:	The ability of a procedure to determine the "true" concentration of an analyte.
Batch:	A group of samples analyzed sequentially using the same calibration curve, reagents, and instrument.
Laboratory Control Standard (LCS):	Laboratory reagent water spiked with known compounds and subjected to the same procedures as the samples. The LCS thus indicates the accuracy of the analytical method and, because it is prepared from a different source than the standard used to calibrate the instrument, it also serves to double-check the calibration.
LC Result:	Laboratory result of an LCS analysis.
LT Result:	Expected result, or true value, of the LCS analysis.
Matrix QC:	Quality control tests performed on actual client samples. For most inorganic analyses, the laboratory uses a pair of duplicate samples and a spiked sample. For most organic analyses, the laboratory uses a pair of spiked samples (duplicate spikes).
Percent Recovery:	The percentage of analyte recovered. For LCS, the percent recovery calculation is $LC \div LT \times 100$. For spike recoveries, the percent recovery calculatiion is $\frac{(S\ Bar - Sample\ Concentration)}{Spike\ Amount} \times 100$
Precision:	The reproducibility of a procedure demonstrated by the agreement between analyses performed on either duplicates of the same sample or a pair of duplicate spikes.
R1, R2 Result:	Result of the analysis of replicate aliquots of a sample, with R1 indicating the first analysis of the sample and R2 its corresponding duplicate; used to determine precision.
Relative Percent Difference (RPD):	Calculated using one of the following: $\frac{(R1 - R2) \times 100}{(R1 + R2) \div 2}$ $\frac{(S1 - S2) \times 100}{(S1 + S2) \div 2}$
S Bar Result:	The average of spike analysis results.
S1, S2 Result:	Result of the analysis of replicate spiked aliquots, with S1 indicating one spike of the sample and S2 the second spike; used to determine precision and accuracy.
True value:	The theoretical, or expected, result of a spike sample analysis.

BC ANALYTICAL

BATCH QC REPORT
ORDER E9003484

DATE REPORTED : 04/04/90

MATRIX QC PRECISION (DUPLICATES)

PARAMETER	DATE ANALYZED	BATCH NUMBER	R1 RESULT	R2 RESULT	UNIT	RELATIVE %DIFF
Fourteen CAM Metals by ICAP						
Silver	03.29.90	64	<0.4	<0.4	mg/kg	NA
Barium	03.29.90	64	76	78	mg/kg	3
Beryllium	03.29.90	64	<0.2	<0.2	mg/kg	NA
Cadmium	03.29.90	64	6.2	6.4	mg/kg	3
Cobalt	03.29.90	64	12	10	mg/kg	18
Chromium	03.29.90	64	67	61	mg/kg	9
Copper	03.29.90	64	40	35	mg/kg	13
Molybdenum	03.29.90	64	<2	<2	mg/kg	NA
Nickel	03.29.90	64	89	93	mg/kg	4
Lead	03.29.90	64	<6	<6	mg/kg	NA
Antimony	03.29.90	64	<1	<1	mg/kg	NA
Thallium	03.29.90	64	<4	<4	mg/kg	NA
Vanadium	03.29.90	64	54	53	mg/kg	2
Zinc	03.29.90	64	61	67	mg/kg	9
Arsenic	03.28.90	60	<1	<1	mg/kg	NA
Arsenic	03.28.90	60	12	11	mg/kg	9
Mercury	03.26.90	42	<0.01	<0.01	mg/kg	NA
Mercury	03.26.90	42	0.0001	<0.0001	mg/L	NA
Selenium	03.29.90	60	0.8	<0.8	mg/kg	NA
Selenium	03.29.90	60	0.9	<0.8	mg/kg	NA

BC ANALYTICAL

BATCH QC REPORT
ORDER E9003484

DATE REPORTED : 04/04/90

MATRIX QC ACCURACY (SPIKES)

PARAMETER	DATE ANALYZED	BATCH NUMBER	SBAR RESULT	TRUE RESULT	RBAR RESULT	UNIT	PERCENT RECOVERY
Fourteen CAM Metals by ICAP							
Silver	03.29.90	64	7.3	10	<0.4	mg/kg	73
Barium	03.29.90	64	570	580	<0.4	mg/kg	98
Beryllium	03.29.90	64	9.8	10	<0.2	mg/kg	98
Cadmium	03.29.90	64	50	56	<0.2	mg/kg	88
Cobalt	03.29.90	64	56	61	<0.2	mg/kg	90
Chromium	03.29.90	64	150	160	<0.2	mg/kg	90
Copper	03.29.90	64	130	140	<0.2	mg/kg	90
Molybdenum	03.29.90	64	73	100	<2	mg/kg	73
Nickel	03.29.90	64	190	190	<2	mg/kg	100
Lead	03.29.90	64	440	500	<6	mg/kg	88
Antimony	03.29.90	64	15	50	<1	mg/kg	30
Thallium	03.29.90	64	72	100	<4	mg/kg	72
Vanadium	03.29.90	64	140	150	<4	mg/kg	90
Zinc	03.29.90	64	250	260	<4	mg/kg	95
Arsenic	03.28.90	60	92	100	<1	mg/kg	92
Arsenic	03.28.90	60	120	110	11.5	mg/kg	110
Mercury	03.26.90	42	0.18	0.20	<0.01	mg/kg	90
Selenium	03.29.90	60	43	100	0.8	mg/kg	43
Selenium	03.29.90	60	99	100	0.9	mg/kg	99

BC ANALYTICAL

BATCH QC REPORT
ORDER E9003484

DATE REPORTED : 04/04/90

METHOD BLANKS AND REPORTING DETECTION LIMIT (RDL)

PARAMETER	DATE ANALYZED	BATCH NUMBER	BLANK RESULT	RDL	UNIT
Fourteen CAM Metals by ICAP					
Silver	03.29.90	64	0.36	0.4	mg/kg
Barium	03.29.90	64	0	1	mg/kg
Beryllium	03.29.90	64	0	0.2	mg/kg
Cadmium	03.29.90	64	0.20	0.8	mg/kg
Cobalt	03.29.90	64	0	0.6	mg/kg
Chromium	03.29.90	64	0.38	1	mg/kg
Copper	03.29.90	64	0	2	mg/kg
Molybdenum	03.29.90	64	0.52	2	mg/kg
Nickel	03.29.90	64	0.14	0.6	mg/kg
Lead	03.29.90	64	0	6	mg/kg
Antimony	03.29.90	64	0	1	mg/kg
Thallium	03.29.90	64	1.9	4	mg/kg
Vanadium	03.29.90	64	0.020	0.6	mg/kg
Zinc	03.29.90	64	0	0.2	mg/kg
Fourteen CAM Metals by ICAP					
Silver	03.29.90	64	0.012	0.4	mg/kg
Barium	03.29.90	64	0	1	mg/kg
Beryllium	03.29.90	64	0	0.2	mg/kg
Cadmium	03.29.90	64	0.005	0.8	mg/kg
Cobalt	03.29.90	64	0.008	0.6	mg/kg
Chromium	03.29.90	64	0	1	mg/kg
Copper	03.29.90	64	0.020	2	mg/kg
Molybdenum	03.29.90	64	0.011	2	mg/kg
Nickel	03.29.90	64	0	0.6	mg/kg
Lead	03.29.90	64	0	6	mg/kg
Antimony	03.29.90	64	0.20	1	mg/kg
Thallium	03.29.90	64	0.18	4	mg/kg
Vanadium	03.29.90	64	0	0.6	mg/kg
Zinc	03.29.90	64	0	0.2	mg/kg
Arsenic	03.28.90	60	0.020	0.4	mg/kg
Arsenic	03.28.90	60	0.010	0.4	mg/kg
Mercury	03.26.90	42	0	0.0001	mg/L
Mercury	03.26.90	42	0	0.0001	mg/L
Mercury	03.26.90	42	0	0.0001	mg/L
Selenium	03.28.90	60	0	0.4	mg/kg
Selenium	03.28.90	60	0.026	0.4	mg/kg

: ORDER PLACED FOR CLIENT: Geomatrix Consultants 9003484 :
: BC ANALYTICAL : EMVL LAB : 11:29:45 04 APR 1990 - P. 1 :

SAMPLES...	SAMPLE DESCRIPTION..	DETERM CODE....	DATE.... ANALYZED	METHOD.....	EQUIP.	BATCH	ID.NO
9003484*1	B-24-6.0	CAM.METALS.ES	03.29.90	6010	515-01	64	7036
		AS	03.28.90	7060	514-01	60	7379
		HG	03.26.90	7471	514-02	42	7753
		SE	03.28.90	7740	514-01	60	7379
		DIG.CAM	03.27.90				7553

***

Notes: Equipment = BC Analytical identification number for a particular piece of analytical equipment.

ID.NO = BC Analytical employee identification number of analyst.

GEOMATRIX CONSULTANTS
ONE MARKET PLAZA
SPEAR STREET TOWER SUITE 717
SAN FRANCISCO, CALIFORNIA 94105
(415) 957-9557

00860

Chain of Custody Record

DATE 3/13/90 PAGE 1 OF 1

PROJECT NO. 1459E

SAMPLERS: (SIGNATURE) [signature]

DATE	TIME	SAMPLE NUMBER	GENERAL MINERAL	PRIORITY POLLUTANT METALS	EPA METHOD 624	EPA METHOD 625	EPA METHOD 601	EPA METHOD 602	EPA METHOD 608	PETROLEUM HYDROCARBONS	Mineral Spirits, BTXE	8240	8270	CAM METALS		NUMBER OF CONTAINERS	REMARKS (SAMPLE PRESERVATION, HANDLING PROCEDURES, OBSERVATIONS, ETC.)
3/13	10:00	B-22-16.0														1	HOLD
3/13	11:40	B-23-6.0									X					1	All soil
3/13	1:45	B-24-6.0									X	X	X	X		1	samples
3/13	4:00	B-24-31.0									X					1	cooled on ice

Remarks: 5-483-1 - 8240 8270; 5-484 = CAM, TTLC

24 hour turnaround ON TPH

Results to Chei Young

ASAP (48-96 hr) TAT for 8240/8270

Metals on STD 2 weeks.

E9003482

TOTAL NUMBER OF CONTAINERS 4

RELINQUISHED BY:	DATE	RECEIVED BY:	RELINQUISHED BY:	DATE	RECEIVED BY: (LAB)
SIGNATURE		SIGNATURE	SIGNATURE [signature]	3/13	SIGNATURE [signature]
PRINTED NAME	TIME	PRINTED NAME	PRINTED NAME CHEI YOUNG	TIME 520	PRINTED NAME CHIHSAN HO
COMPANY		COMPANY	COMPANY GEOMATRIX		LABORATORY BCA

RELINQUISHED BY:	DATE	RECEIVED BY:
SIGNATURE		SIGNATURE
PRINTED NAME	TIME	PRINTED NAME
COMPANY		COMPANY

METHOD OF SHIPMENT: hand delivery

LABORATORY COMMENTS / OBSERVATIONS

DISTRIBUTION: WHITE, CANARY - LABORATORY, PINK - ORIGINATOR

Analytical Report

LOG NO: E90-03-571

Received: 15 MAR 90
Reported: 20 MAR 90

Ms. Cheri Young
Geomatrix Consultants
1 Market Plaza, Spear Tower, Ste.717
San Francisco, California 94105

Purchase Order: 1459E

REPORT OF ANALYTICAL RESULTS

LOG NO	SAMPLE DESCRIPTION, SOIL SAMPLES	DATE SAMPLED
03-571-1	B-25-10.5	15 MAR 90
03-571-2	B-26-6.0	15 MAR 90
03-571-3	B-26-23.5	15 MAR 90

PARAMETER	03-571-1	03-571-2	03-571-3
TPH-Volatile Hydrocarbons/BTEX			
Date Analyzed	03.15.90	03.15.90	03.15.90
Dilution Factor, Times	1	1	1
Benzene, mg/kg	<0.3	<0.3	<0.3
Ethylbenzene, mg/kg	<0.3	<0.3	<0.3
Toluene, mg/kg	<0.3	<0.3	<0.3
Total Xylene Isomers, mg/kg	<0.3	<0.3	<0.3
C4 to C12 Hydrocarbons, mg/kg	<10	<10	<10
Other TPH-Volatile Hydrocarbons/BTEX	---	---	---

Sim D. Lessley, Ph.D., Laboratory Director

1255 Powell Street
Emeryville, CA 94608

415/428-2300
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BCA *B C Analytical*

BROWN AND CALDWELL ANALYTICAL LABORATORIES

BATCH QC REPORT
Definitions and Terms

Accuracy: The ability of a procedure to determine the "true" concentration of an analyte.

Batch: A group of samples analyzed sequentially using the same calibration curve, reagents, and instrument.

Laboratory Control Standard (LCS): Laboratory reagent water spiked with known compounds and subjected to the same procedures as the samples. The LCS thus indicates the accuracy of the analytical method and, because it is prepared from a different source than the standard used to calibrate the instrument, it also serves to double-check the calibration.

LC Result: Laboratory result of an LCS analysis.

LT Result: Expected result, or true value, of the LCS analysis.

Matrix QC: Quality control tests performed on actual client samples. For most inorganic analyses, the laboratory uses a pair of duplicate samples and a spiked sample. For most organic analyses, the laboratory uses a pair of spiked samples (duplicate spikes).

Percent Recovery: The percentage of analyte recovered.
For LCS, the percent recovery calculation is

$$LC \div LT \times 100.$$

For spike recoveries, the percent recovery calculatiion is

$$\frac{(\text{S Bar} - \text{Sample Concentration})}{\text{Spike Amount}} \times 100$$

Precision: The reproducibility of a procedure demonstrated by the agreement between analyses performed on either duplicates of the same sample or a pair of duplicate spikes.

R1, R2 Result: Result of the analysis of replicate aliquots of a sample, with R1 indicating the first analysis of the sample and R2 its corresponding duplicate; used to determine precision.

Relative Percent Difference (RPD): Calculated using one of the following:

$$\frac{(R1 - R2) \times 100}{(R1 + R2) \div 2} \qquad \frac{(S1 - S2) \times 100}{(S1 + S2) \div 2}$$

S Bar Result: The average of spike analysis results.

S1, S2 Result: Result of the analysis of replicate spiked aliquots, with S1 indicating one spike of the sample and S2 the second spike; used to determine precision and accuracy.

True value: The theoretical, or expected, result of a spike sample analysis.

BC ANALYTICAL

BATCH QC REPORT
ORDER E9003571

DATE REPORTED : 03/21/90

LABORATORY CONTROL STANDARDS

PARAMETER	DATE ANALYZED	BATCH NUMBER	LC RESULT	LT RESULT	UNIT	PERCENT RECOVERY
PH-Volatile Hydrocarbons/BTEX						
Dilution Factor	03.18.90	76	1	1	Times	100
Benzene	03.18.90	76	100	100	ug/L	100
Ethylbenzene	03.18.90	76	110	100	ug/L	110
Toluene	03.18.90	76	100	100	ug/L	100
Total Xylene Isomers	03.18.90	76	240	200	ug/L	120
C4 to C12 Hydrocarbons	03.18.90	76	1000	1100	ug/L	91

BC ANALYTICAL

BATCH QC REPORT
ORDER E9003571

DATE REPORTED : 03/21/90

MATRIX QC PRECISION (DUPLICATE SPIKES)

PARAMETER	DATE ANALYZED	BATCH NUMBER	S1 RESULT	S2 RESULT	UNIT	RELATIVE % DIFF
TPH-Volatile Hydrocarbons/BTEX						
Dilution Factor	03.15.90	76	1	1	Times	0
Benzene	03.15.90	76	5.1	5.2	mg/kg	2
Ethylbenzene	03.15.90	76	5.4	5.5	mg/kg	2
Toluene	03.15.90	76	5.3	5.4	mg/kg	2
Total Xylene Isomers	03.15.90	76	12	12	mg/kg	0
C4 to C12 Hydrocarbons	03.15.90	76	50	50	mg/kg	0

BC ANALYTICAL

BATCH QC REPORT
ORDER E9003571

DATE REPORTED : 03/21/90

MATRIX QC ACCURACY (SPIKES)

PARAMETER	DATE ANALYZED	BATCH NUMBER	SBAR RESULT	TRUE VALUE	UNIT	PERCENT RECOVERY
TPH-Volatile Hydrocarbons/BTEX						
Benzene	03.15.90	76	5.15	5	mg/kg	103
Ethylbenzene	03.15.90	76	5.45	5	mg/kg	109
Toluene	03.15.90	76	5.35	5	mg/kg	107
Total Xylene Isomers	03.15.90	76	12	10	mg/kg	120
C4 to C12 Hydrocarbons	03.15.90	76	50	53	mg/kg	94

BC ANALYTICAL

BATCH QC REPORT
ORDER E9003571

DATE REPORTED : 03/21/90

METHOD BLANKS AND REPORTING DETECTION LIMIT (RDL)

PARAMETER	DATE ANALYZED	BATCH NUMBER	BLANK RESULT	RDL	UNIT
TPH-Volatile Hydrocarbons/BTEX					
Date Analyzed	03.15.90	76	03.15.90	NA	Date
Dilution Factor	03.15.90	76	1	NA	Times
Benzene	03.15.90	76	0.020	0.1	mg/kg
Ethylbenzene	03.15.90	76	0.017	0.1	mg/kg
Toluene	03.15.90	76	0.023	0.1	mg/kg
Total Xylene Isomers	03.15.90	76	0.075	0.1	mg/kg
C4 to C12 Hydrocarbons	03.15.90	76	0.57	5	mg/kg

: ORDER PLACED FOR CLIENT: Geomatrix Consultants 9003571 :
: BC ANALYTICAL : EMVL LAB : 11:59:39 21 MAR 1990 - P. 1 :

SAMPLES...	SAMPLE DESCRIPTION..	DETERM CODE....	DATE.... ANALYZED	METHOD.....	EQUIP.	BATCH	ID.NO
9003571*1	B-25-10.5	GASOLINE.5030.BTEX	03.15.90	5030/8015	516-19	76	7194
9003571*2	B-26-6.0	GASOLINE.5030.BTEX	03.15.90	5030/8015	516-19	76	7194
9003571*3	B-26-23.5	GASOLINE.5030.BTEX	03.15.90	5030/8015	516-19	76	7194

***

Notes: Equipment = BC Analytical identification number for a particular piece of analytical equipment.

ID.NO = BC Analytical employee identification number of analyst.

9003 571

00861

GEOMATRIX CONSULTANTS

ONE MARKET PLAZA
SPEAR STREET TOWER SUITE 717
SAN FRANCISCO, CALIFORNIA 94105
(415) 957-9557

Chain of Custody Record

DATE 3/15/90 PAGE 1 OF 1

PROJECT NO. 1459E

SAMPLERS: (SIGNATURE) Cheri Young

DATE	TIME	SAMPLE NUMBER	GENERAL MINERAL	PRIORITY POLLUTANT METALS	EPA METHOD 624	EPA METHOD 625	EPA METHOD 601	EPA METHOD 602	EPA METHOD 608	PETROLEUM HYDROCARBONS Mineral Spirits BTXE					NUMBER OF CONTAINERS
3/15	10:30	B-25-10.5 (1)								X					1
3/15	1:15	B-26-6.0 (2)								X					1
3/15	3:00	B-26-23.5 (3)								X					1

TOTAL NUMBER OF CONTAINERS 3

REMARKS
(SAMPLE PRESERVATION, HANDLING PROCEDURES, OBSERVATIONS, ETC.)

All soil samples cooled to 4°C

24 hr turnaround

Results to Cheri Young

RELINQUISHED BY:	DATE	RECEIVED BY:
SIGNATURE		SIGNATURE
PRINTED NAME	TIME	PRINTED NAME
COMPANY		COMPANY

RELINQUISHED BY:	DATE	RECEIVED BY:
SIGNATURE		SIGNATURE
PRINTED NAME	TIME	PRINTED NAME
COMPANY		COMPANY

RELINQUISHED BY:	DATE	RECEIVED BY: (LAB)
Cheri Young	3/15	Monika Coll
SIGNATURE		SIGNATURE
CHERI YOUNG	TIME	Monika Coll
PRINTED NAME	4:45	PRINTED NAME
GEOMATRIX		BCA
COMPANY		LABORATORY

METHOD OF SHIPMENT: hand delivery

LABORATORY COMMENTS / OBSERVATIONS

DISTRIBUTION: WHITE, CANARY - LABORATORY, PINK - ORIGINATOR

Analytical Report

LOG NO: E90-04-765

Received: 25 APR 90
Reported: 04 MAY 90

Ms. Cheri Young
Geomatrix Consultants
1 Market Plaza, Spear Tower, Ste.717
San Francisco, California 94105

Project: 1459E

REPORT OF ANALYTICAL RESULTS

LOG NO	SAMPLE DESCRIPTION, SOIL SAMPLES	DATE SAMPLED
04-765-1	E-6	25 APR 90

PARAMETER	04-765-1
TPH and BTEX - Modified 8015	
Date Analyzed	05.03.90
Dilution Factor, Times	1
Benzene, mg/kg	<0.3
Ethylbenzene, mg/kg	<0.3
Toluene, mg/kg	<0.3
Total Xylene Isomers, mg/kg	<0.3
Total Fuel Hydrocarbons, mg/kg	<10
Other TPH and BTEX - Modified 8015	---

Sim D. Lessley, Ph.D., Laboratory Director

1255 Powell Street
Emeryville, CA 94608

415/428-2300
Fax: 415/547-3643

BCA B C Analytical

CHAIN OF CUSTODY RECORD

BCA Log Number 9004105

Client name	Project or PO#
GEOMATRIX CONSULTANTS	1459E
Address: One Market Plaza	Phone #: 957-9557
City, State, Zip: San Francisco CA	Report attention: Cheri Young

Sampled by: Cheri Young

Analyses required: Mineral Spirits; BTX&E; Hazardous sample / Special handling required

Lab Sample number	Date sampled	Time sampled	Type* See key below	Sample description	Number of containers	Mineral Spirits	BTX&E						Hazardous sample Special handling required	Remarks
	4/25	12:30	SO	~~SO~~ E-7 changed to E-6 cy	1	X	X							

	Signature	Print Name	Company	Date	Time
Relinquished by	Cheri Young	CHERI YOUNG	GeomaTrix	4/25/90	1:15
Received by					
Relinquished by					
Received by					
Relinquished by					
Received by Laboratory	Monika Scott	MONIKA SCOTT	BCA	4-25-9	1:20 pm

B C ANALYTICAL

☐ 1255 Powell Street, Emeryville, CA 94608 (415) 428-2300

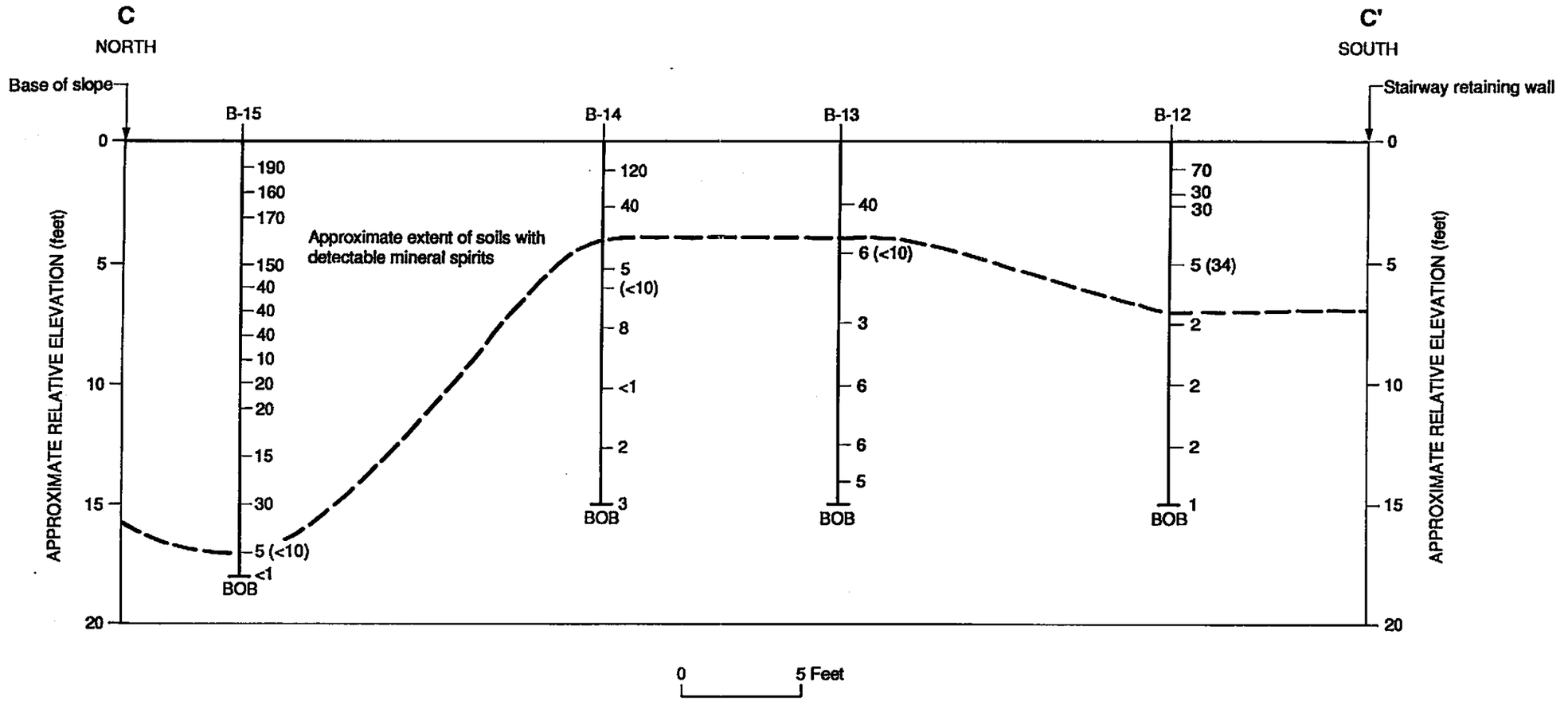
☐ 801 Western Avenue, Glendale, CA 91201 (818) 247-5737

☐ 1200 Pacifico Avenue, Anaheim, CA 92805 (714) 978-0113

Note: Samples are discarded 30 days after results are reported unless other arrangements are made. Hazardous samples will be returned to client or disposed of at client's expense.

Disposal arrangements: ______

*KEY: AQ—Aqueous NA—Nonaqueous SL—Sludge GW—Groundwater SO—Soil OT—Other PE—Petroleum



KEY

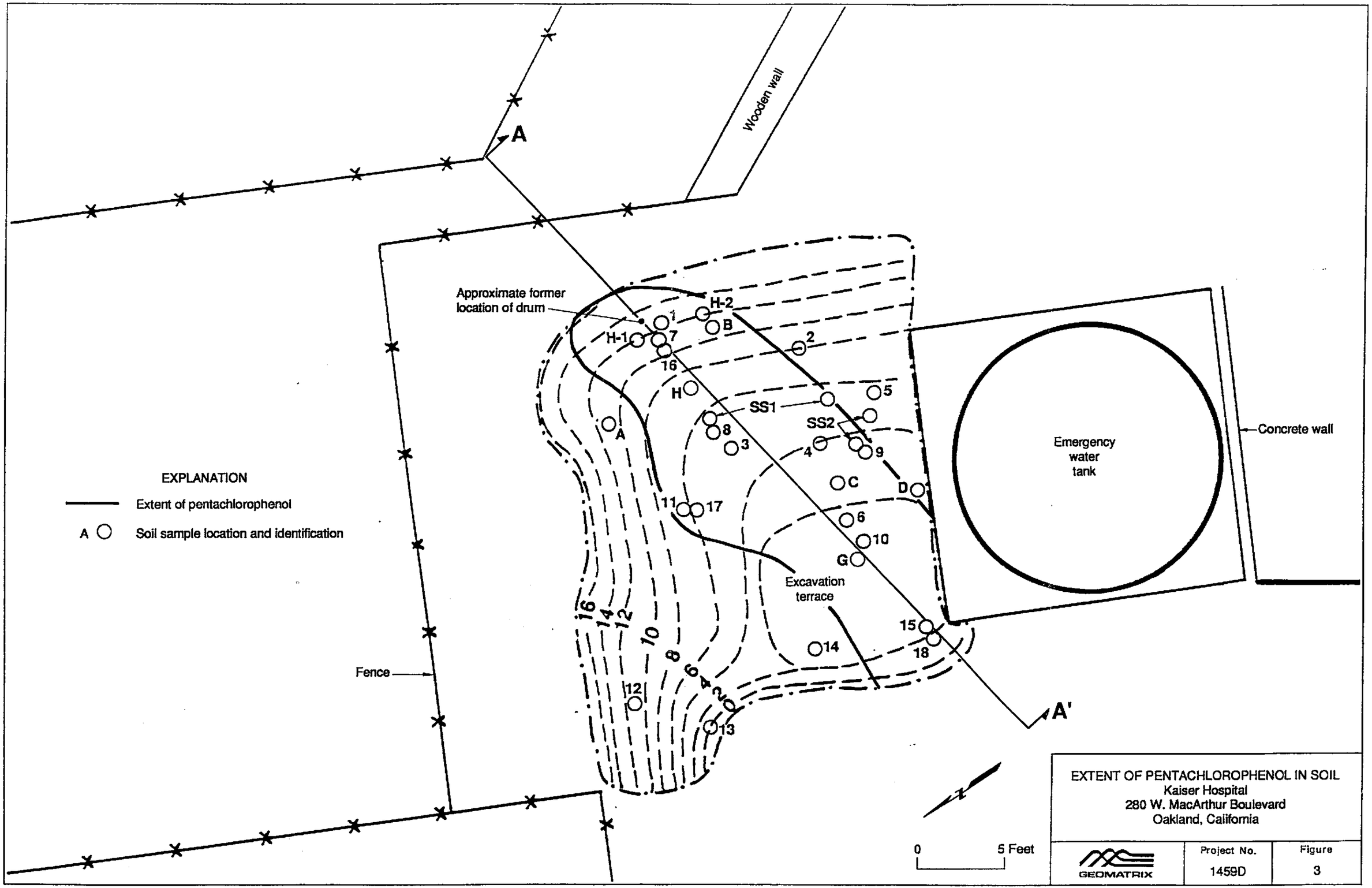
B-13
6 (<10)
BOB

Boring with photoionization detection reading (PID) of volatile organics in parts per million (ppm); laboratory confirmation analysis in parenthesis; BOB indicates bottom of boring

CROSS SECTION BEHIND MECHANICAL BUILDING
Kaiser Hospital
Oakland, California

GEOMATRIX

Project No.	Figure
1459E	2


A
Wooden wall
Approximate former location of drum
H-2
B
H-1
1
7
16
2
H
5
SS1
SS2
8
3
4
9
A
C
D
11
17
6
10
G
Excavation terrace
15
18
14
12
13
Fence
Concrete wall
Emergency water tank
A'
16
14
12
10
8
6
4
2
0
EXPLANATION
Extent of pentachlorophenol
A
Soil sample location and identification
0
5 Feet
EXTENT OF PENTACHLOROPHENOL IN SOIL
Kaiser Hospital
280 W. MacArthur Boulevard
Oakland, California
GEOMATRIX
Project No.
1459D
Figure
3