December 4, 1997

Ms. Madhulla Logan
Alameda County Health Care Services Agency
Department of Environmental Health
1131 Harbor Bay Parkway, 2nd Floor
Alameda, CA 94502

Re: October 1997 Semiannual Ground Water Sampling Report
Mills College Corporation Yard, Oakland, California
Project No.: K275-H (973)

Dear Ms. Logan:

We are pleased to submit our report for the above referenced project. In summary, no significant changes were observed at the site during the October 1997 monitoring event. Should you have any questions or require additional information, please do not hesitate to contact me.

Sincerely,

Harza Engineering Company

Derek Armentrout
Project Chemist

ll\encl.
Copies: Addressee
Mr. David Johnson (Mills College)
Case Officer (Regional Water Quality Control Board)

K275hrep.050
12/4/97

October 1997 Semiannual
Ground Water Sampling Report
Mills College Corporation Yard
Oakland, California

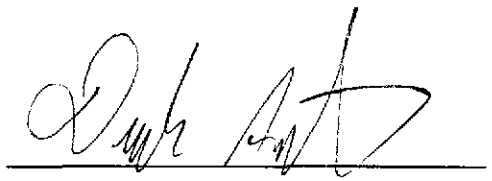
December 4, 1997

Prepared For:

Mills College
5000 MacArthur Boulevard
Oakland, CA 94613

Prepared By:

Harza Engineering Company
425 Roland Way
Oakland, CA 94621



Derek Armentrout
Project Chemist

Mark C. Litzau
Manager, Environmental Services

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12/4/97

HARZA

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October 1997 Semiannual Ground Water Sampling Report

Mills College Corporation Yard, Oakland, California

1.0 INTRODUCTION

This report presents the results of the October 1997 semiannual ground water sampling performed at the Mills College Corporation Yard in Oakland, California. The project location is shown on the Site Vicinity Map (Figure 1).

The purpose of the investigation has been to evaluate the extent of petroleum hydrocarbons in ground water related to a previously removed gasoline underground storage tank (UST) at the site. The investigation included collecting and analyzing ground water samples from five existing monitoring wells. This investigation was performed to comply with the continuing monitoring program under the jurisdiction of Alameda County Health Care Services Agency (ACHCSA).

2.0 BACKGROUND

In October 1988, a 1,000-gallon gasoline UST was removed from the Corporation Yard facility. A report prepared by Blaine Tech Services, Inc. of San Jose, California, indicated that soil samples collected from a depth of 21 feet below ground surface (bgs) following tank removal contained moderately high levels of total petroleum hydrocarbons as gasoline (TPHg). It is understood that 100 cubic yards of contaminated soils were excavated from the tank pit area at the time of tank removal and aerated on-site.

Beginning in June 1989, Harza (formerly Kaldveer Associates) performed soil and ground water quality investigations at the site, consisting of the installation and sampling of three ground water monitoring wells (MW-1 through MW-3) and two additional shallow soil borings. The results of these investigations, presented in a report titled *Soil and Ground Water Testing Report for Mills College Corporation Yard,* dated May 7, 1991, indicated that the majority of gasoline contamination in the unsaturated zone in the vicinity of the tanks appeared to have been removed during the soil excavation program conducted when the tanks were removed. Additional wells were installed in May 1994 (MW-4) and April 1995 (MW-5).

Analysis of ground water samples collected from the monitoring wells since June 1989 have indicated the presence of TPHg at concentrations up to 11 parts per million (ppm). The measured ground water flow direction at the site has been toward the south to west-southwest.

3.0 SCOPE OF SERVICES

The investigation consisted of the following tasks:

- Measuring ground water levels for use in developing a ground water elevation contour map.
- Collecting ground water samples from the five existing wells at the Corporation Yard.
- Analyzing the ground water samples for TPHg and for purgeable aromatic compounds (benzene, toluene, ethylbenzene, and xylenes [BTEX]).

4.0 FIELD INVESTIGATION

4.1 Monitoring Well Sampling

Monitoring wells MW-1 through MW-5 were sampled on October 28, 1997. Following an initial ground water level measurement, a minimum of three well-casing volumes of water were purged from each well using a Teflon bailer or a submersible pump. Purging consisted of the gradual removal of water from the well until physical parameters such as pH, temperature, and electrical conductivity (EC) stabilized. Well MW-5 dewatered before three casing volumes could be removed. A sample was therefore collected from this well after the water recovered to 80% of its original volume.

Following purging, samples were collected using a Teflon bailer, placed in appropriate sample containers, labeled, and placed in refrigerated storage for transport to the laboratory under chain-of-custody control. The bailer and pump were washed with trisodium phosphate (TSP) and rinsed with deionized water between wells to reduce the potential for cross contamination. Purge water was contained on-site in 55-gallon drums.

4.2 Ground Water Gradient

Well-top elevations, depth to water, and calculated water-surface elevations are presented in Table 1. These data are used to generate the ground water elevation contours presented on Figure 2. No significant changes were observed from the previous monitoring event.

The water levels are similar in wells MW-1, MW-2, and MW-3, suggesting a flat gradient in this area. However, a relatively steep, west-southwestward gradient is depicted using wells MW-1,

MW-4, and MW-5. In our opinion, ground water levels measured in wells MW-1 through MW-3 appear to be influenced by the highly transmissive backfill used in the former tank excavation. Only data from wells MW-1, MW-4, and MW-5 were used to calculate the ground water gradient and flow direction shown on Figure 2. It is our professional opinion that ground water most likely follows the natural surface topography and flows toward the west or southwest. Wells MW-4 and MW-5 appear sufficient for monitoring downgradient water quality in any of the historically observed or potential ground water flow directions.

5.0 ANALYTICAL RESULTS

5.1 Laboratory Procedures

Ground water samples were analyzed by American Environmental Network (AEN) of Pleasant Hill, California. AEN is certified by the California Environmental Protection Agency for the analyses performed. Samples from each well were analyzed for TPHg using EPA Method 5030/GC-FID, and for BTEX using EPA Method 8020.

5.2 Analytical Results

The results of the chemical analyses are presented in Table 2 and laboratory analytical reports are attached as Appendix A. A historical summary of ground water sample analytical results is also included in Table 2. No significant changes were observed from the previous monitoring event.

TPHg was detected in the sample from well MW-1 at a concentration of 1.0 ppm. BTEX compounds were detected in the sample from MW-1 at concentrations of 0.16, 0.036, 0.035, and 0.070 ppm, respectively. A petroleum odor and a slight hydrocarbon sheen on the water surface were recognized during the purging of the well.

Benzene was detected in the sample from well MW-2 at 0.022 ppm, and in the sample from well MW-3 at 0.0057 ppm. TPHg concentrations were below the laboratory method reporting limit (MRL) of 0.05 ppm in these wells. No TPHg or BTEX compounds were detected at or above the MRLs in the samples from wells MW-4 and MW-5.

6.0 CONCLUSIONS AND RECOMMENDATIONS

The October 1997 analytical results are consistent with recent monitoring events, and no significant changes have been observed in ground water quality. The plume does not appear to be migrating

significantly, as evidenced by nondetectable levels of contaminants in downgradient wells MW-4 and MW-5. Measured hydrocarbon concentrations appear relatively stable in wells MW-2 and MW-3. Ground water elevations in wells MW-1, MW-4, and MW-5 indicate a general ground water flow direction toward the west-southwest.

Preparation and submittal of reports will continue on a semiannual basis, contingent on ground water quality continuing to exhibit little variation, and on contaminants remaining on-site. The next monitoring event is scheduled for April 1998.

7.0 LIMITATIONS

The purpose of a geologic/hydrogeologic study is to reasonably characterize existing site conditions based on the geology/hydrogeology of the area. In performing such a study, a balance must be struck between a reasonable investigation into the site conditions and an exhaustive analysis of each conceivable condition. The following paragraphs discuss the assumptions and parameters under which such a study is conducted.

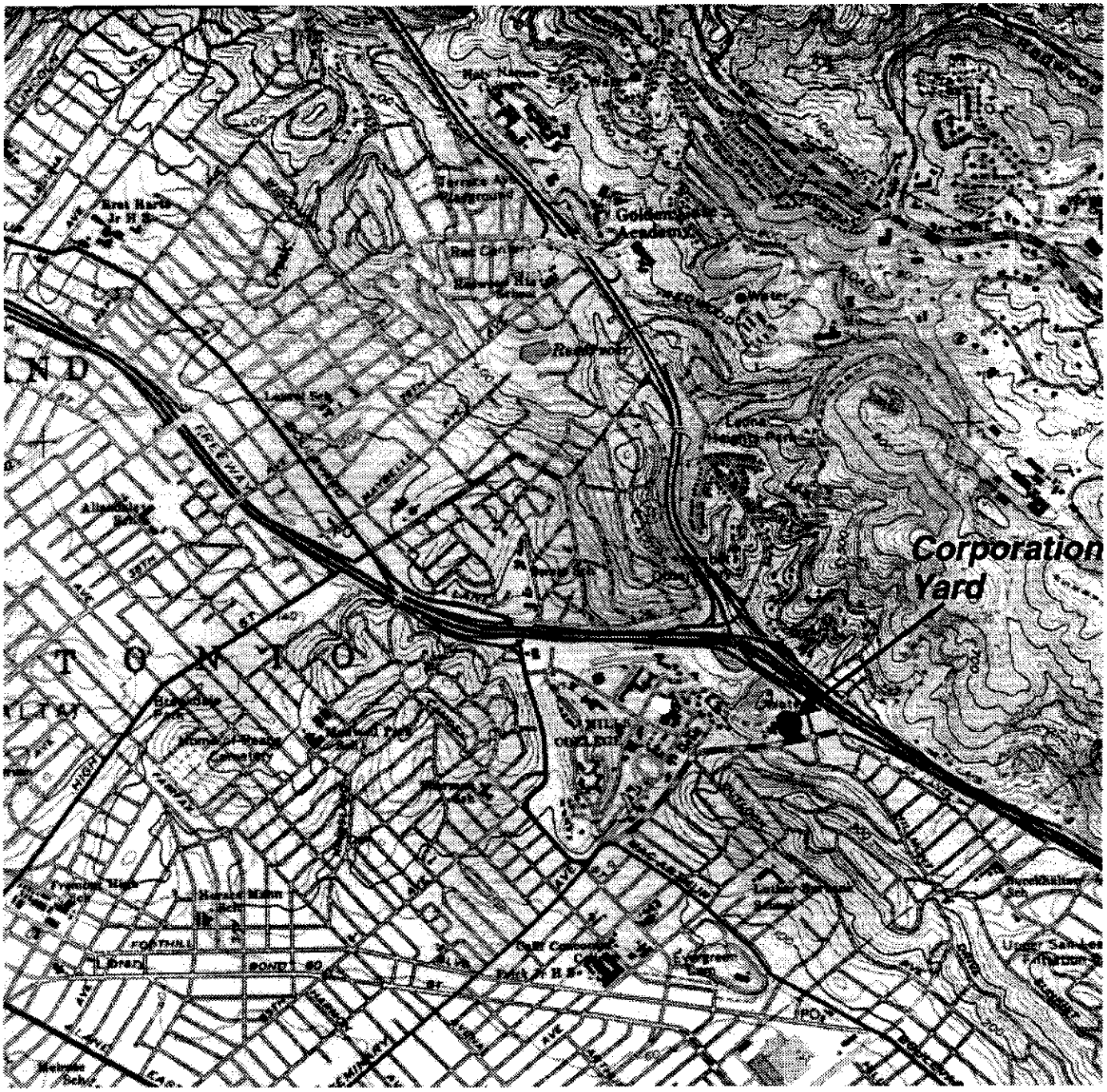
No investigation is thorough enough to detect every geologic/hydrogeologic condition of interest at a given site. If conditions have not been identified during the study, such a finding should not therefore be construed as a guarantee of the absence of such conditions at the site, but rather as the result of the services performed within the scope, limitations, and cost of the work performed.

We are unable to report on or accurately predict events that may change the site conditions after the described services are performed, whether occurring naturally or caused by external forces. We cannot assume responsibility for conditions we were not authorized to evaluate, or conditions not generally recognized as predictable when services were performed.

Geologic/hydrogeologic conditions may exist at the site that cannot be identified solely by visual observation. Where subsurface exploratory work was performed, our professional opinions are based in part on interpretation of data from discrete sampling locations that may not represent actual conditions at unsampled locations.

TABLES

FIGURES



Approximate Scale In Miles

0 1/2 1

BASE: By U.S.G.S. Oakland East, California, 7.5 Min. Quadrangle Topography.

E275G1

Date		SITE VICINITY MAP	Figure
12/97	HARZA	MILLS COLLEGE CORPORATION YARD FACILITY Oakland, California	1
Project No. K275-H			

APPENDIX A

Laboratory Analytical Reports

HARZA

SAMPLE ID: MW-1
AEN LAB NO: 9710335-01
AEN WORK ORDER: 9710335
CLIENT PROJ. ID: K275-H

DATE SAMPLED: 10/28/97
DATE RECEIVED: 10/28/97
REPORT DATE: 11/05/97

ANALYTE	METHOD/ CAS#	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED
BTEX & Gasoline HCs	**EPA 8020**				
Benzene	71-43-2	160 *	0.5	ug/L	10/30/97
Toluene	108-88-3	36 *	0.5	ug/L	10/30/97
Ethylbenzene	100-41-4	35 *	0.5	ug/L	10/30/97
Xylenes, Total	1330-20-7	70 *	2	ug/L	10/30/97
Purgeable HCs as Gasoline	5030/GCFID	1.0 *	0.05	mg/L	10/30/97

ND = Not detected at or above the reporting limit
* = Value at or above reporting limit

HARZA

SAMPLE ID: MW-5
AEN LAB NO: 9710335-05
AEN WORK ORDER: 9710335
CLIENT PROJ. ID: K275-H

DATE SAMPLED: 10/28/97
DATE RECEIVED: 10/28/97
REPORT DATE: 11/05/97

ANALYTE	METHOD/ CAS#	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED
BTEX & Gasoline HCs	**EPA 8020**				
Benzene	71-43-2	ND	0.5	ug/L	10/30/97
Toluene	108-88-3	ND	0.5	ug/L	10/30/97
Ethylbenzene	100-41-4	ND	0.5	ug/L	10/30/97
Xylenes, Total	1330-20-7	ND	2	ug/L	10/30/97
Purgeable HCs as Gasoline	5030/GCFID	ND	0.05	mg/L	10/30/97

ND = Not detected at or above the reporting limit
* = Value at or above reporting limit

AEN (CALIFORNIA)
QUALITY CONTROL REPORT

AEN JOB NUMBER: 9710335

CLIENT PROJECT ID: K275-H

Quality Control Summary

All laboratory quality control parameters were found to be within established limits.

Definitions

Laboratory Control Sample (LCS)/Method Spike(s): Control samples of known composition. LCS and Method Spike data are used to validate batch analytical results.

Matrix Spike(s): Aliquot of a sample (aqueous or solid) with added quantities of specific compounds and subjected to the entire analytical procedure. Matrix spike and matrix spike duplicate QC data are advisory.

Method Blank: An analytical control consisting of all reagents, internal standards, and surrogate standards carried through the entire analytical process. Used to monitor laboratory background and reagent contamination.

Not Detected (ND): Not detected at or above the reporting limit.

Relative Percent Difference (RPD): An indication of method precision based on duplicate analysis.

Reporting Limit (RL): The lowest concentration routinely determined during laboratory operations. The RL is generally 1 to 10 times the Method Detection Limit (MDL). Reporting limits are matrix, method, and analyte dependent and take into account any dilutions performed as part of the analysis.

Surrogates: Organic compounds which are similar to analytes of interest in chemical behavior, but are not found in environmental samples. Surrogates are added to all blanks, calibration and check standards, samples, and spiked samples. Surrogate recovery is monitored as an indication of acceptable sample preparation and instrumental performance.

D: Surrogates diluted out.

#: Indicates result outside of established laboratory QC limits.

QUALITY CONTROL DATA

METHOD: EPA 8020, 5030 GCFID

AEN JOB NO: 9710335
INSTRUMENT: H
MATRIX: WATER

Surrogate Standard Recovery Summary

Date Analyzed	Client Id.	Lab Id.	Percent Recovery Fluorobenzene
10/30/97	MW-1	01	87
10/30/97	MW-2	02	104
10/30/97	MW-3	03	102
10/30/97	MW-4	04	101
10/30/97	MW-5	05	103
QC Limits:			70-130

DATE ANALYZED: 10/30/97
SAMPLE SPIKED: LCS
INSTRUMENT: H

Laboratory Control Sample Recovery

Analyte	Spike Added (ug/L)	Percent Recovery	RPD	QC Limits Percent Recovery	QC Limits RPD
Benzene	100	94	1	70-130	20
Toluene	100	96	2	70-130	20
Ethylbenzene	100	99	1	70-130	20
Total Xylenes	300	101	1	70-130	20

Daily method blanks for all associated analytical runs showed no contamination at or above the reporting limit.

*** END OF REPORT ***

R-3,5-1 9710335 Page 1 of 1

Contact: Taaia Miller

HARZA *Consulting Engineers and Scientists*
425 Roland Way (510) 568-4001
Oakland, CA 94621 (510) 568-2205 Fax

Project Number	Lab Project Number
K275-H	9710335
Project Name	**Sampler's Name (printed)**
Mills College - Corp. Yard	Taaia Miller

Harza Sample ID	Lab Sample ID	Date	Time	Sample Type	Number/Type of Container	TPH as Gasoline / BTEX	TPH as Diesel / Motor Oil / Full Scan /	Method 418.1 - TRPH	Method 8240 - Volatile Organic Compounds	Method 8010 - Halogenated VOCs	Method 8020 - BTEX	Method 8270 - Semivolatile Organic Compounds	Method 8080 - Organochlorine Pesticides / PCBs	Metals -	Remarks
MW-1	01ABC	10/20/97		Wtr	3x40mL VOAs	X									10-31-97 Past history - Invoice to Mills College T. Ryan
MW-2	02ABC					X									
MW-3	03ABC					X									
MW-4	04ABC					X									
MW-5	05ABC			↓	↓	X									

Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Date	Time
Taaia C. Miller	10/20/97	1300	Rick Gilmore	10-28-97	14:45
Rick Gilmore	10-28-97	18:35		10/28/97	1835
Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Date	Time

Requested Turnaround Time: ☒ Standard ☐ 3-Day ☐ 2-Day ☐ 24-Hour ☐ other ☐ FAX Results

NOTES

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