

January 18, 2000

Mr. Tom Peacock
Alameda County Health Care Services Agency
Department of Environmental Health
1131 Harbor Bay Parkway, 2nd Floor
Alameda, CA 94502

Re: January 2000 Ground Water Sampling Report
Mills College Corporation Yard, Oakland, California
Project No.: 16198-EA

Dear Mr. Peacock:

We are pleased to submit our report for the above referenced project. In summary, no significant changes were observed at the site during the January 2000 monitoring event. Should you have any questions or require additional information, please do not hesitate to contact me.

Sincerely,

Harza Engineering Company



Mark C. Litzau
Regional Manager, Environmental & Regulatory Services

GR:mac\ tg / encl.

Copies: Addressee (1)

Mr. Paul Richards (Mills College -1)

Case Officer (Regional Water Quality Control Board -1)

16198EARPT.001

1/18/00

HARZA ENGINEERING CO., INC.

GARY J. RILEY

Project Engineer

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Direct Line:
510.636.2156

January 2000
Ground Water Sampling Report
Mills College Corporation Yard
Oakland, California

January 19, 2000

Prepared For:

Mills College
5000 MacArthur Boulevard
Oakland, CA 94613

Prepared By:

Harza Engineering Company, Inc.
425 Roland Way
Oakland, CA 94621



Gary J. Riley
Project Engineer



Mark C. Litzau
Manager, Environmental Services

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January 2000 Ground Water Sampling Report

Mills College Corporation Yard, Oakland, California

1.0 INTRODUCTION

This report presents the results of the January 2000 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, as well as installation of two soil borings adjacent to well MW-4. This investigation was performed to comply with the requests of the 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.

In a October 15, 1999 letter, ACHCSA requested additional work at the site prior to evaluating the site for closure:

- An additional round of ground water samples collected from wells MW-1 through MW-5 analyzed for MTBE using EPA Method 8260
- Installation of a soil boring adjacent to MW-4 and collection of a “grab” ground water sample

3.0 SCOPE OF SERVICES

The investigation consisted of the following tasks:

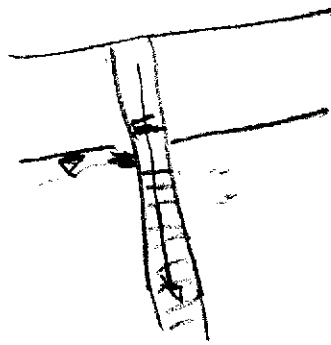
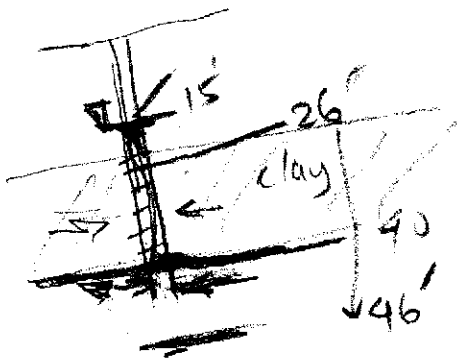
- Measuring ground water levels for use in developing a ground water elevation contour map.
- Collecting ground water samples from the five existing wells at the Corporation Yard.
- Installation of soil borings adjacent to MW-4 in an attempt to collect a grab ground water sample
- Analyzing the ground water samples for TPHg, purgeable aromatic compounds (benzene, toluene, ethylbenzene, and xylenes [BTEX]), and for methyl *tert*-butyl ether (MTBE)

4.0 FIELD INVESTIGATION

4.1 Monitoring Well Sampling

Monitoring wells MW-1 through MW-5 were sampled on January 6, 2000. 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. Purging consisted of the gradual removal of water from the well until the physical parameters pH, temperature, and electrical conductivity (EC) stabilized.

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 was washed with Alcanox[®] 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 Soil Borings

A Geoprobe Model 5400 direct-push system, operated by Fast-Tek Engineering Support Services of Point Richmond, California was used to install two soil borings, one each approximately 3 feet east and 3 feet west of well MW-4. A boring was requested by ACHCSA in order to assess ground water quality in this area because, in their opinion, MW-4 screens below the water table and may not yield samples representative of the presence of lighter hydrocarbons in shallow ground water.

Boring 1 was advanced to a total depth of 28 feet bgs 3 feet east of MW-4. No ground water was encountered in the boring. Boring 2 was advanced to a total depth of 36 feet bgs three feet west of MW-4. Again, no ground water was encountered. This was the maximum depth that could be explored using the available Geoprobe system, and no further exploration was performed.

The static ground water level in MW-4 was measured to be 15.51 feet bgs, and the total depth of this well is 46 feet. In our opinion, ground water is confined in this area and is first encountered at a depth of between 36 and 44 feet bgs. The static water level in MW-4 is higher than the actual depth to water in the ground, indicating confined conditions. Since MW-4 is screened from 26 to 46 feet bgs, the screened interval is encountering the top of the water-bearing layer in the subsurface and, in our opinion, allows for accurate sampling and analysis of light hydrocarbons in ground water.

How did they get this depth?

4.3 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, westward 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 Columbia Analytical Services of Santa Clara, California. CAS is certified by the California Department of Health Services for the analyses performed. Samples from each well were analyzed for TPHg using EPA Method 5030/GC-FID, for BTEX using EPA Method 8020, and for MTBE using EPA Method 8260.

5.2 Analytical Results

The results of the chemical analyses are presented in Tables 2 and 3, 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 11 ppm. BTEX compounds were detected in the sample from MW-1 at concentrations of 0.17, 0.014, 0.022, and 0.036 ppm, respectively. A petroleum odor was recognized during the purging of the well.

Benzene was detected in the sample from well MW-2 at 0.7 ppm, and in the sample from well MW-3 at 0.0031 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.

The compound MTBE was encountered in wells MW-1 and MW-3 at a concentration of 7.4 parts per billion (ppb) and 1.4 ppb, respectively. MTBE was not encountered in any of the other wells at the site at levels above the laboratory method reporting limit of 0.5 ppb.

6.0 CONCLUSIONS AND RECOMMENDATIONS

The January 2000 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 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.

Borings installed adjacent to MW-4 indicate that the first ground water is encountered at a depth greater than 38 feet bgs. Therefore, the screened interval of MW-4 is sufficient to capture the top of the water-bearing layer and samples collected from MW-4 are representative of ground water condition.

Based on continued findings of no evidence of plume migration or changes in ground water quality, and the low levels of MTBE in two wells, we recommend this site be considered for closure.

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

Ground Water Elevation Data

January 2000 Ground Water Sampling Report
Mills College Corporation Yard, Oakland, California
(Reported in Feet)

Date	Monitoring Well	Relative Well-Top Elevation ⁽¹⁾	Depth to Water	Ground Water Elevation
June 1989	MW-1	100.00	19.44	80.56
	MW-2	99.98	19.36	80.62
	MW-3	100.01	19.40	80.61
December 1990	MW-1	100.00	22.05	77.95
	MW-2	99.98	21.96	78.02
	MW-3	100.01	22.00	78.01
June 1991	MW-1	100.00	20.85	79.15
	MW-2	99.98	20.76	79.22
	MW-3	100.01	20.81	79.20
March 1992	MW-1	100.00	19.87	80.13
	MW-2	99.98	19.92	80.06
	MW-3	100.01	19.82	80.19
October 1992	MW-1	100.00	21.69	78.31
	MW-2	99.98	21.60	78.38
	MW-3	100.01	21.65	78.36
May 1994	MW-1	100.00	19.66	80.34
	MW-2	99.98	19.62	80.36
	MW-3	100.01	19.60	80.41
	MW-4	88.88	13.60	75.28
June 1994	MW-1	100.00	19.72	80.28
	MW-2	99.98	19.65	80.33
	MW-3	100.01	19.65	80.36
	MW-4	88.88	14.01	74.87
October 1994	MW-1	100.00	20.17	79.83
	MW-2	99.98	20.10	79.88
	MW-3	100.01	20.08	79.93
	MW-4	88.88	17.95	70.93
January 1995	MW-1	100.00	17.46	82.54
	MW-2	99.98	17.48	82.50
	MW-3	100.01	17.30	82.71
	MW-4	88.88	10.76	78.12
May 1995	MW-1	100.00	15.56	84.44
	MW-2	99.98	15.75	84.23
	MW-3	100.01	15.50	84.51
	MW-4	88.88	9.25	79.63
	MW-5	99.98	27.66	72.32

Ground Water Elevation Data
 January 2000 Ground Water Sampling Report
 Mills College Corporation Yard, Oakland, California
 (Reported in Feet)

Date	Monitoring Well	Relative Well-Top Elevation ⁽¹⁾	Depth to Water	Ground Water Elevation
October 1995	MW-1	100.00	18.68	81.32
	MW-2	99.98	18.21	81.77
	MW-3	100.01	18.62	81.39
	MW-4	88.88	14.65	74.23
	MW-5	99.98	28.36	71.62
May 1996	MW-1	100.00	15.92	84.08
	MW-2	99.98	15.70	84.28
	MW-3	100.01	15.83	84.18
	MW-4	88.88	9.55	79.33
	MW-5	99.98	25.51	74.47
September 1996	MW-1	100.00	17.74	82.26
	MW-2	99.98	17.67	82.31
	MW-3	100.01	17.64	82.37
	MW-4	88.88	14.59	74.29
	MW-5	99.98	27.83	72.15
April 1997	MW-1	100.00	16.91	83.09
	MW-2	99.98	16.82	83.16
	MW-3	100.01	16.83	83.18
	MW-4	88.88	11.77	77.11
	MW-5	99.98	26.93	73.05
October 1997	MW-1	100.00	19.00	81.00
	MW-2	99.98	18.96	81.02
	MW-3	100.01	18.98	81.03
	MW-4	88.88	16.10	72.78
	MW-5	99.98	31.25	68.73
May 1998	MW-1	100.00	14.36	85.64
	MW-2	99.98	14.37	85.61
	MW-3	100.01	14.11	85.90
	MW-4	88.88	8.84	80.04
	MW-5	99.98	23.38	76.60
January 2000	MW-1	100.00	18.75	81.25
	MW-2	99.98	18.68	81.30
	MW-3	100.01	18.69	81.32
	MW-4	88.88	15.51	73.37
	MW-5	99.98	29.92	70.06

NOTE

⁽¹⁾ Well-top elevations are based on an arbitrary datum of 100.00 feet at MW-1.

TABLE 2
Ground Water Sample Analytical Results
 January 2000 Ground Water Sampling Report
 Mills College Corporation Yard, Oakland, California

Sample ID	Sample Date	TPHg ppm	Benzene ppm	Toluene ppm	Ethylbenzene ppm	Xylenes ppm
MW-1	June 1989	11.	2.1	1.9	0.031	1.4
	December 1990	2.5	0.4	0.21	0.056	0.31
	June 1991	16.	2.0	1.1	0.41	2.8
	March 1992	1.6	0.26	0.1	0.47	0.12
	October 1992	2.8	0.33	0.13	0.06	0.2
	October 1992 (D)	4.2	0.54	0.23	0.08	0.36
	May 1994	3.4	0.6	0.11	0.11	0.15
	October 1994	8.7	1.0	0.29	0.14	0.36
	January 1995	5.9	1.5	0.088	0.13	0.14
	April 1995	3.4	0.78	0.34	0.1	0.21
	October 1995	0.87	0.092	0.026	0.041	0.025
	May 1996	1.0	0.2	0.068	0.035	0.05
	September 1996	1.5	0.27	0.073	0.064	0.0095
	April 1997	0.6	0.12	0.027	0.024	0.028
	October 1997	1.0	0.16	0.036	0.035	0.07
May 1998	0.51	0.16	0.041	0.045	0.022	
January 2000	11.	0.17	0.014	0.022	0.036	
MW-2	June 1989	ND	ND	ND	ND	ND
	December 1990	ND	ND	ND	ND	ND
	June 1991	ND	0.005	0.0005	ND	ND
	March 1992	0.09	0.047	ND	ND	ND
	October 1992	ND	0.003	0.0006	ND	ND
	May 1994	0.2	0.084	ND	ND	ND
	October 1994	0.2	0.13	ND	ND	ND
	January 1995	0.7	0.21	ND	ND	ND
	May 1995	ND	0.004	ND	ND	ND
	October 1995	0.2	0.11	ND	ND	ND
	May 1996	0.2	0.086	ND	0.001	ND
	September 1996	0.09	0.059	ND	ND	ND
	April 1997	ND	0.022	ND	ND	ND
	October 1997	ND	0.022	ND	ND	ND
	May 1998	ND	0.012	ND	ND	ND
January 2000	ND	0.7	ND	ND	ND	
MW-3	June 1989	ND	ND	ND	ND	ND
	December 1990	0.05	0.011	ND	ND	ND
	June 1991	0.1	0.007	ND	ND	ND
	March 1992	0.09	0.27	0.0009	ND	ND
	October 1992	ND	0.005	ND	ND	ND

TABLE 2
Ground Water Sample Analytical Results
 January 2000 Ground Water Sampling Report
 Mills College Corporation Yard, Oakland, California

Sample ID	Sample Date	TPHg ppm	Benzene ppm	Toluene ppm	Ethylbenzene ppm	Xylenes ppm
MW-3 (continued)	May 1994	ND	0.005	ND	ND	ND
	October 1994	ND	0.004	ND	ND	ND
	January 1995	ND	0.012	ND	ND	ND
	May 1995	0.07	0.006	ND	ND	ND
	October 1995	ND	0.002	ND	ND	0.002
	May 1996	ND	0.007	ND	ND	ND
	September 1996	ND	0.012	ND	ND	ND
	April 1997	ND	0.043	ND	ND	ND
	October 1997	ND	0.0057	ND	ND	ND
	May 1998	ND	0.0049	ND	ND	ND
January 2000	ND	0.0031	ND	ND	ND	
MW-4	May 1994	ND	ND	ND	ND	ND
	June 1994	ND	ND	ND	ND	ND
	October 1994	ND	ND	ND	ND	ND
	January 1995	ND	ND	ND	ND	ND
	May 1995	ND	ND	ND	ND	ND
	October 1995	ND	ND	ND	ND	ND
	May 1996	ND	ND	ND	ND	ND
	September 1996	ND	ND	ND	ND	ND
	April 1997	ND	ND	ND	ND	ND
	October 1997	ND	ND	ND	ND	ND
	May 1998	ND	ND	ND	ND	ND
January 2000	ND	ND	ND	ND	ND	
MW-5	April 1995	ND	ND	ND	ND	ND
	October 1995	ND	ND	ND	ND	ND
	May 1996	ND	ND	ND	ND	ND
	September 1996	ND	ND	ND	ND	ND
	April 1997	ND	ND	ND	ND	ND
	October 1997	ND	ND	ND	ND	ND
	May 1998	ND	ND	ND	ND	ND
January 2000	ND	ND	ND	ND	ND	

NOTES

TPHg: Total petroleum hydrocarbons as gasoline

ppm: Parts per million or milligrams per liter

ND: Not detected at or above the laboratory method reporting limits

(D): Duplicate sample analytical results

TABLE 3
MTBE Concentration Data
January 2000 Ground Water Sampling Report
Mills College Corporation Yard, Oakland, California

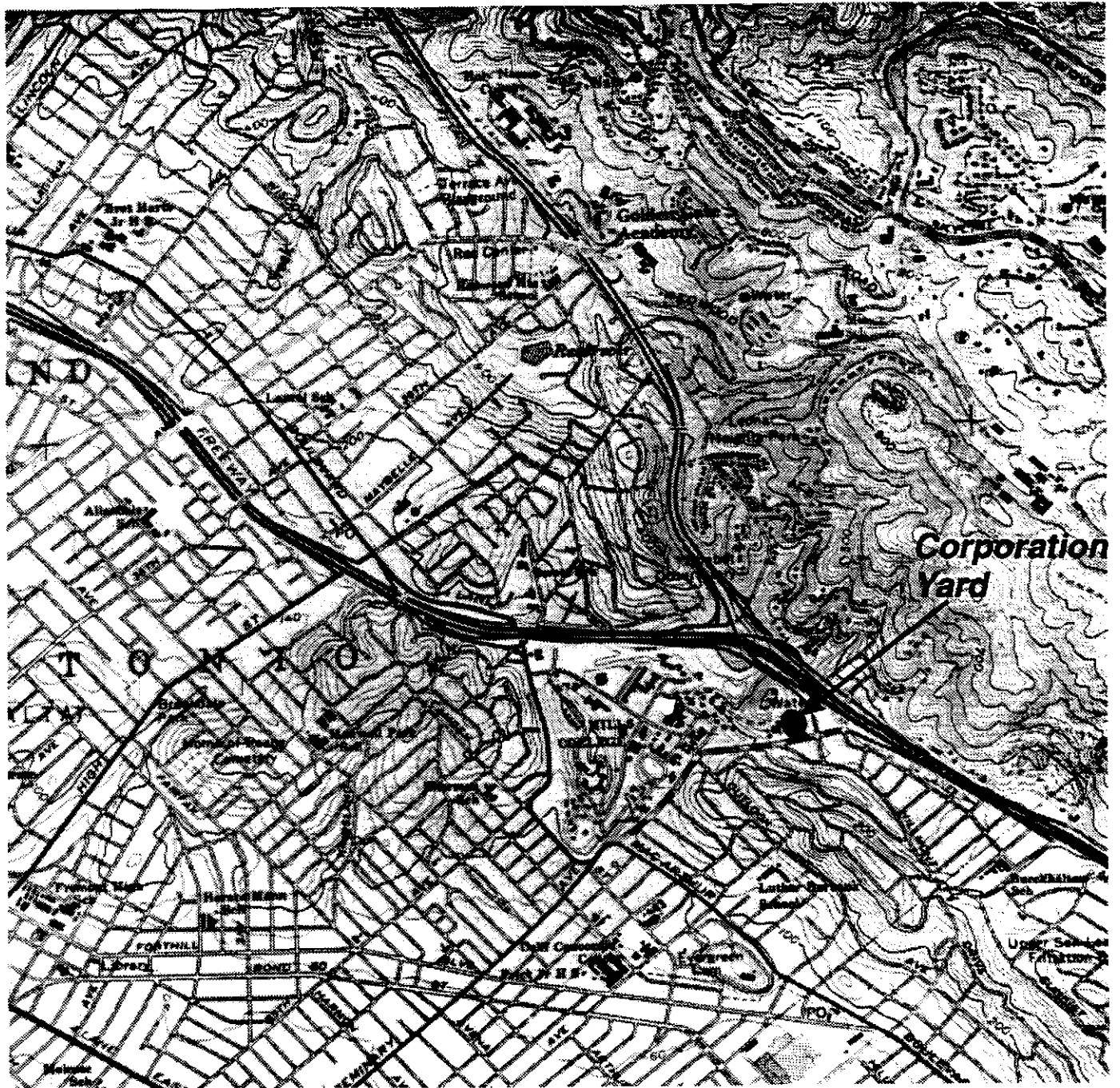
Date	Monitoring Well	MTBE (ppb)
January 2000	MW-1	7.4
	MW-2	ND
	MW-3	1.4
	MW-4	ND
	MW-5	ND

NOTE

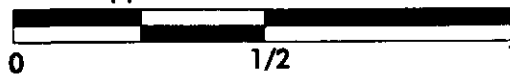
Results reporting in micrograms per liter, or parts per billion (ppb)

ND: Not detected above laboratory method reporting limit

FIGURES



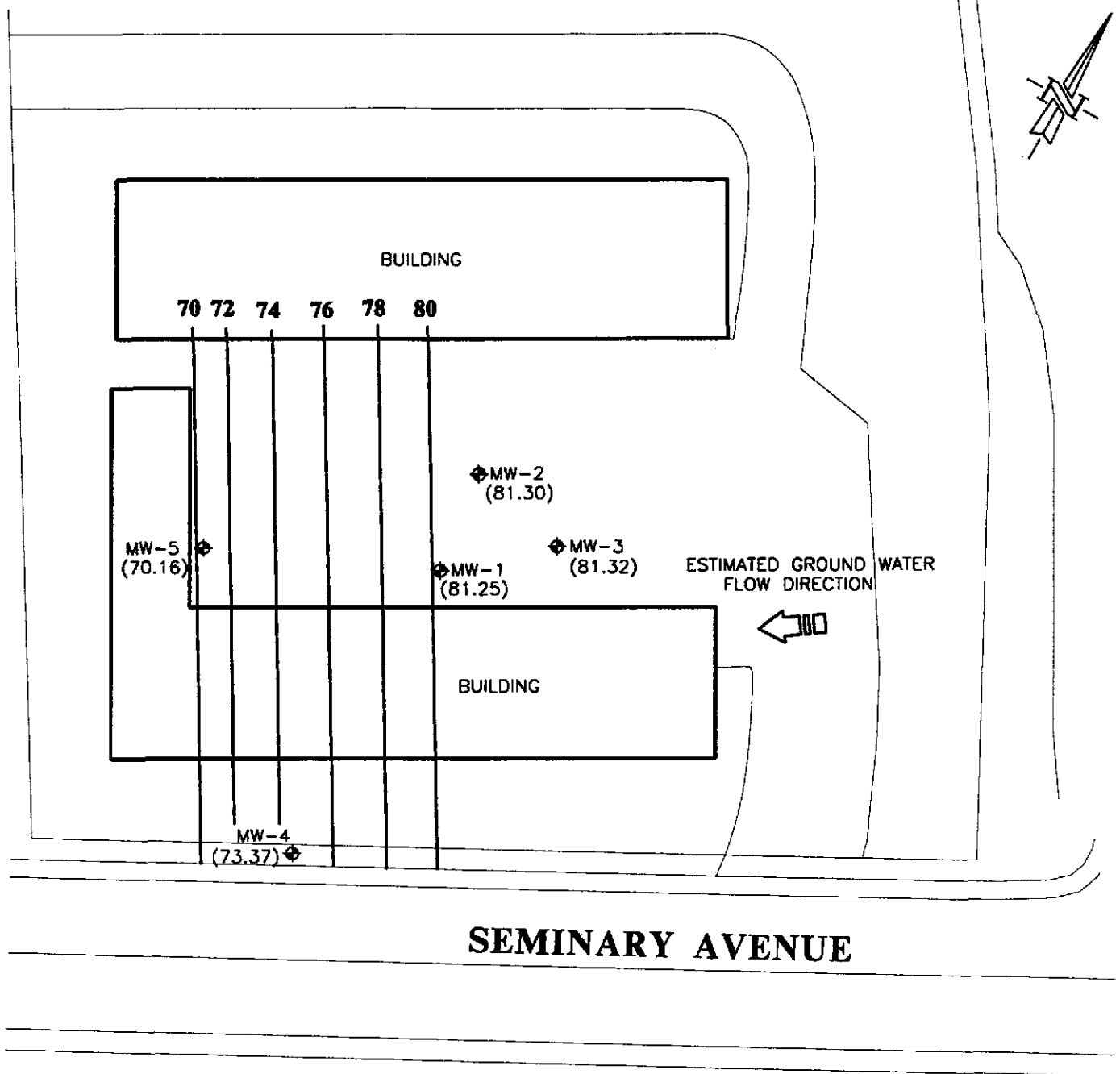
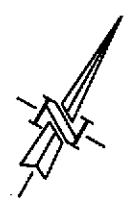
Approximate Scale In Miles



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

E275G1

Date	HARZA	SITE VICINITY MAP	Figure
11/95		MILLS COLLEGE CORPORATION YARD FACILITY Oakland, California	1
Project No.			
K275-H			



SEMINARY AVENUE

LEGEND

- MW-5 ◆ MONITORING WELL LOCATION WITH RELATIVE GROUND WATER ELEVATION MEASURED 06JAN00
- 82 ——— GROUND WATER CONTOUR

3	DR	GR	17JAN00
2	HH	CC	17OCT98
1	DF	DA	24SEP96
MARK	BY	CHK'D	DATE

HARZA
Engineering Company
 425 Roland Way.
 Oakland, California. 94621
 Tel: (510)568-4001 - Fax:(510)568-2205

DRAWN BY: DF, HH, DR
 PREP'D BY: CC, GR
 CHECKED BY: ML
 SCALE: 1" = 50'
 DATE: 17JAN00
 DRAWING FILE: 16198EA-01

SITE PLAN
MILLS COLLEGE
CORPORATION YARD FACILITY
OAKLAND, CALIFORNIA

FIGURE
2
PROJECT No.
16198-EA

K:\projects\16198ea\16198ea-01.dwg

APPENDIX A
Laboratory Analytical Reports



January 14, 2000

Service Request No.: S2000066

Mr. Gary Riley
Harza Consulting Engineers and Scientists
425 Roland Way
Oakland, CA 94621

RE: Mills College/16198-EA

Dear Mr. Riley:

Enclosed are the results of the sample(s) submitted to our laboratory on January 7, 2000. All analyses were performed in accordance with our laboratory's quality assurance program. Results are intended to be considered in their entirety and apply to the sample(s) analyzed. Columbia Analytical Services is not responsible for use of less than the complete report. Signature of this CAS Analytical Report confirms that pages 2 through 8, following, have been thoroughly reviewed and approved for release.

Columbia Analytical Services is certified for environmental analyses by the California Department of Health Services (certificate number: 2352, expiration: January 31, 2001).

If you have any questions, please call me at (408) 748-9700.

Respectfully submitted,

Columbia Analytical Services, Inc.

Bernadette Troncales
Project Chemist

COLUMBIA ANALYTICAL SERVICES, Inc.

Acronyms

A2LA	American Association for Laboratory Accreditation
ASTM	American Society for Testing and Materials
BOD	Biochemical Oxygen Demand
BTEX	Benzene, Toluene, Ethylbenzene, Xylenes
CAM	California Assessment Metals
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
COD	Chemical Oxygen Demand
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DLCS	Duplicate Laboratory Control Sample
DMS	Duplicate Matrix Spike
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
ELAP	Environmental Laboratory Accreditation Program
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
IC	Ion Chromatography
ICB	Initial Calibration Blank sample
ICP	Inductively Coupled Plasma atomic emission spectrometry
ICV	Initial Calibration Verification sample
J	Estimated concentration. The value is less than the MRL, but greater than or equal to the MDL. If the value is equal to the MRL, the result is actually <MRL before rounding.
LCS	Laboratory Control Sample
LUFT	Leaking Underground Fuel Tank
M	Modified
MBAS	Methylene Blue Active Substances
MCL	Maximum Contaminant Level. The highest permissible concentration of a substance allowed in drinking water as established by the U. S. EPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
MS	Matrix Spike
MTBE	Methyl tert-Butyl Ether
NA	Not Applicable
NAN	Not Analyzed
NC	Not Calculated
NCASI	National Council of the paper industry for Air and Stream Improvement
ND	Not Detected at or above the method reporting/detection limit (MRL/MDL)
NIOSH	National Institute for Occupational Safety and Health
NTU	Nephelometric Turbidity Units
ppb	Parts Per Billion
ppm	Parts Per Million
PQL	Practical Quantitation Limit
QA/QC	Quality Assurance/Quality Control
RCRA	Resource Conservation and Recovery Act
RPD	Relative Percent Difference
SIM	Selected Ion Monitoring
SM	Standard Methods for the Examination of Water and Wastewater, 18th Ed., 1992
STLC	Solubility Threshold Limit Concentration
SW	Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW-846, 3rd Ed., 1986 and as amended by Updates I, II, IIA, and IIB.
TCLP	Toxicity Characteristic Leaching Procedure
TDS	Total Dissolved Solids
TPH	Total Petroleum Hydrocarbons
tr	Trace level. The concentration of an analyte that is less than the PQL but greater than or equal to the MDL. If the value is equal to the PQL, the result is actually <PQL before rounding.
TRPH	Total Recoverable Petroleum Hydrocarbons
TSS	Total Suspended Solids
TTLC	Total Threshold Limit Concentration
VOA	Volatile Organic Analyte(s)

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: HARZA Engineering Company of California
Project: Mills College/16198-EA
Sample Matrix: Water

Service Request: S2000066
Date Collected: 01/06/00
Date Received: 01/07/00

EPA Method 8260
Volatile Organic Compounds

Sample Name: MW-4
Lab Code: S2000066-001
Test Notes:

Units: ug/L (ppb)
Basis: NA

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Methyl <i>tert</i> -Butyl Ether	EPA 5030A	8260	0.5	1	NA	01/12/00	ND	

Approved By: _____



Date: _____

01/14/00

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:
Project:
Sample Matrix:

HARZA Engineering Company of California
Mills College/16198-EA
Water

Service Request: S2000066
Date Collected: NA
Date Received: NA

EPA Method 8260
Volatile Organic Compounds

Sample Name:
Lab Code:
Test Notes:

Method Blank (MS01)
S200112-WB2

Units: ug/L (ppb)
Basis: NA

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Methyl <i>tert</i> -Butyl Ether	EPA 5030A	8260	0.5	1	NA	01/12/00	ND	

Approved By: _____

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Date: _____

01/14/00

1344021271P

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: HARZA Engineering Company of California
Project: Mills College/16198-EA
Sample Matrix: Water

Service Request: S2000066
Date Collected: 01/06/00
Date Received: 01/07/00

BTEX and TPH as Gasoline

Sample Name: MW-4
Lab Code: S2000066-001
Test Notes:

Units: ug/L (ppb)
Basis: NA

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
TPH as Gasoline	EPA 5030	CA/LUFT	50	1	NA	01/11/00	ND	
Benzene	EPA 5030	8021B	0.5	1	NA	01/11/00	ND	
Toluene	EPA 5030	8021B	0.5	1	NA	01/11/00	ND	
Ethylbenzene	EPA 5030	8021B	0.5	1	NA	01/11/00	ND	
Xylenes, Total	EPA 5030	8021B	1	1	NA	01/11/00	ND	

Approved By: _____



Date: 01/14/00

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: HARZA Engineering Company of California
Project: Mills College/16198-EA
Sample Matrix: Water

Service Request: S2000066
Date Collected: NA
Date Received: NA

BTEX and TPH as Gasoline

Sample Name: Method Blank
Lab Code: S200111-WB1
Test Notes:

Units: ug/L (ppb)
Basis: NA

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
TPH as Gasoline	EPA 5030	CA/LUFT	50	1	NA	01/11/00	ND	
Benzene	EPA 5030	8021B	0.5	1	NA	01/11/00	ND	
Toluene	EPA 5030	8021B	0.5	1	NA	01/11/00	ND	
Ethylbenzene	EPA 5030	8021B	0.5	1	NA	01/11/00	ND	
Xylenes, Total	EPA 5030	8021B	1	1	NA	01/11/00	ND	

Approved By: _____



Date: _____

01/14/02



January 14, 2000

Service Request No.: S2000068

Mr. Gary Riley
Harza Consulting Engineers and Scientists
425 Roland Way
Oakland, CA 94621

RE: Mills College/16198-EA

Dear Mr. Riley:

Enclosed are the results of the sample(s) submitted to our laboratory on January 7, 2000. All analyses were performed in accordance with our laboratory's quality assurance program. Results are intended to be considered in their entirety and apply to the sample(s) analyzed. Columbia Analytical Services is not responsible for use of less than the complete report. Signature of this CAS Analytical Report confirms that pages 2 through 14, following, have been thoroughly reviewed and approved for release.

Columbia Analytical Services is certified for environmental analyses by the California Department of Health Services (certificate number: 2352, expiration: January 31, 2001).

If you have any questions, please call me at (408) 748-9700.

Respectfully submitted,

Columbia Analytical Services, Inc.

Bernadette Troncales
Project Chemist

COLUMBIA ANALYTICAL SERVICES, Inc.**Acronyms**

A2LA	American Association for Laboratory Accreditation
ASTM	American Society for Testing and Materials
BOD	Biochemical Oxygen Demand
BTEX	Benzene, Toluene, Ethylbenzene, Xylenes
CAM	California Assessment Metals
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
COD	Chemical Oxygen Demand
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DLCS	Duplicate Laboratory Control Sample
DMS	Duplicate Matrix Spike
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
ELAP	Environmental Laboratory Accreditation Program
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
IC	Ion Chromatography
ICB	Initial Calibration Blank sample
ICP	Inductively Coupled Plasma atomic emission spectrometry
ICV	Initial Calibration Verification sample
J	Estimated concentration. The value is less than the MRL, but greater than or equal to the MDL. If the value is equal to the MRL, the result is actually <MRL before rounding.
LCS	Laboratory Control Sample
LUFT	Leaking Underground Fuel Tank
M	Modified
MBAS	Methylene Blue Active Substances
MCL	Maximum Contaminant Level. The highest permissible concentration of a substance allowed in drinking water as established by the U. S. EPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
MS	Matrix Spike
MTBE	Methyl tert-Butyl Ether
NA	Not Applicable
NAN	Not Analyzed
NC	Not Calculated
NCASI	National Council of the paper industry for Air and Stream Improvement
ND	Not Detected at or above the method reporting/detection limit (MRL/MDL)
NIOSH	National Institute for Occupational Safety and Health
NTU	Nephelometric Turbidity Units
ppb	Parts Per Billion
ppm	Parts Per Million
PQL	Practical Quantitation Limit
QA/QC	Quality Assurance/Quality Control
RCRA	Resource Conservation and Recovery Act
RPD	Relative Percent Difference
SIM	Selected Ion Monitoring
SM	Standard Methods for the Examination of Water and Wastewater, 18th Ed., 1992
STLC	Solubility Threshold Limit Concentration
SW	Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW-846, 3rd Ed., 1986 and as amended by Updates I, II, IIA, and IIB.
TCLP	Toxicity Characteristic Leaching Procedure
TDS	Total Dissolved Solids
TPH	Total Petroleum Hydrocarbons
tr	Trace level. The concentration of an analyte that is less than the PQL but greater than or equal to the MDL. If the value is equal to the PQL, the result is actually <PQL before rounding.
TRPH	Total Recoverable Petroleum Hydrocarbons
TSS	Total Suspended Solids
TTLC	Total Threshold Limit Concentration
VOA	Volatile Organic Analyte(s)

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: HARZA Engineering Company of California
Project: Mills College/16198-EA
Sample Matrix: Water

Service Request: S2000068
Date Collected: 01/06/00
Date Received: 01/07/00

EPA Method 8260
Volatile Organic Compounds

Sample Name: MW-1
Lab Code: S2000068-001
Test Notes:

Units: ug/L (ppb)
Basis: NA

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Methyl <i>tert</i> -Butyl Ether	EPA 5030A	8260	0.5	1	NA	01/12/00	7.4	

Approved By: _____

AS

Date: _____

01/14/00

12440213710

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: HARZA Engineering Company of California
Project: Mills College/16198-EA
Sample Matrix: Water

Service Request: S2000068
Date Collected: 01/06/00
Date Received: 01/07/00

EPA Method 8260
Volatile Organic Compounds

Sample Name: MW-2
Lab Code: S2000068-002
Test Notes:

Units: ug/L (ppb)
Basis: NA

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Methyl tert -Butyl Ether	EPA 5030A	8260	0.5	1	NA	01/13/00	ND	

Approved By: _____



Date: _____

01/14/00

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: HARZA Engineering Company of California
Project: Mills College/16198-EA
Sample Matrix: Water

Service Request: S2000068
Date Collected: 01/06/00
Date Received: 01/07/00

EPA Method 8260
Volatile Organic Compounds

Sample Name: MW-3
Lab Code: S2000068-003
Test Notes:

Units: ug/L (ppb)
Basis: NA

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Methyl tert -Butyl Ether	EPA 5030A	8260	0.5	1	NA	01/13/00	1.4	

Approved By: _____

RT

Date: _____

01/14/00

1344021371p

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: HARZA Engineering Company of California
Project: Mills College/16198-EA
Sample Matrix: Water

Service Request: S2000068
Date Collected: 01/06/00
Date Received: 01/07/00

EPA Method 8260
Volatile Organic Compounds

Sample Name: MW-5
Lab Code: S2000068-004
Test Notes:

Units: ug/L (ppb)
Basis: NA

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Methyl tert-Butyl Ether	EPA 5030A	8260	0.5	1	NA	01/13/00	ND	

Approved By: _____



Date: _____

01/14/00

1344021371P

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:
Project:
Sample Matrix:

HARZA Engineering Company of California
Mills College/16198-EA
Water

Service Request: S2000068
Date Collected: NA
Date Received: NA

EPA Method 8260
Volatile Organic Compounds

Sample Name:
Lab Code:
Test Notes:

Method Blank
S200112-WB2

Units: ug/L (ppb)
Basis: NA

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Methyl tert -Butyl Ether	EPA 5030A	8260	0.5	1	NA	01/12/00	ND	

Approved By: _____



Date: _____

01/14/00

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: HARZA Engineering Company of California
Project: Mills College/16198-EA
Sample Matrix: Water

Service Request: S2000068
Date Collected: NA
Date Received: NA
Date Extracted: NA
Date Analyzed: NA

Surrogate Recovery Summary
Volatile Organic Compounds

Prep Method: EPA 5030A
Analysis Method: 8260

Units: PERCENT
Basis: NA

Sample Name	Lab Code	Test Notes	P e r c e n t R e c o v e r y		
			Dibromofluoromethane	Toluene-D8	4-Bromofluorobenzene
MW-1	S2000068-001		88	102	102
MW-2	S2000068-002		90	99	92
MW-3	S2000068-003		91	99	91
MW-5	S2000068-004		92	100	92
Method Blank	S200112-WB2		89	100	92

CAS Acceptance Limits: 57-167 62-138 62-140

Approved By: _____



Date: _____

01/14/07

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: HARZA Engineering Company of California
Project: Mills College/16198-EA
Sample Matrix: Water

Service Request: S2000068
Date Collected: 01/06/00
Date Received: 01/07/00

BTEX and TPH as Gasoline

Sample Name: MW-1
Lab Code: S2000068-001
Test Notes:

Units: ug/L (ppb)
Basis: NA

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
TPH as Gasoline	EPA 5030	CA/LUFT	50	1	NA	01/12/00	1100	
Benzene	EPA 5030	8021B	0.5	1	NA	01/12/00	170	
Toluene	EPA 5030	8021B	0.5	1	NA	01/12/00	14	
Ethylbenzene	EPA 5030	8021B	0.5	1	NA	01/12/00	22	
Xylenes, Total	EPA 5030	8021B	1	1	NA	01/12/00	36	

Approved By: _____



Date: _____

01/14/00

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: HARZA Engineering Company of California
Project: Mills College/16198-EA
Sample Matrix: Water

Service Request: S2000068
Date Collected: 01/06/00
Date Received: 01/07/00

BTEX and TPH as Gasoline

Sample Name: MW-2
Lab Code: S2000068-002
Test Notes:

Units: ug/L (ppb)
Basis: NA

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
TPH as Gasoline	EPA 5030	CA/LUFT	50	1	NA	01/11/00	ND	
Benzene	EPA 5030	8021B	0.5	1	NA	01/11/00	0.7	
Toluene	EPA 5030	8021B	0.5	1	NA	01/11/00	ND	
Ethylbenzene	EPA 5030	8021B	0.5	1	NA	01/11/00	ND	
Xylenes, Total	EPA 5030	8021B	1	1	NA	01/11/00	ND	

Approved By: _____



Date: _____

01/14/00

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: HARZA Engineering Company of California
Project: Mills College/16198-EA
Sample Matrix: Water

Service Request: S2000068
Date Collected: 01/06/00
Date Received: 01/07/00

BTEX and TPH as Gasoline

Sample Name: MW-3
Lab Code: S2000068-003
Test Notes:

Units: ug/L (ppb)
Basis: NA

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
TPH as Gasoline	EPA 5030	CA/LUFT	50	1	NA	01/11/00	ND	
Benzene	EPA 5030	8021B	0.5	1	NA	01/11/00	3.1	
Toluene	EPA 5030	8021B	0.5	1	NA	01/11/00	ND	
Ethylbenzene	EPA 5030	8021B	0.5	1	NA	01/11/00	ND	
Xylenes, Total	EPA 5030	8021B	1	1	NA	01/11/00	ND	

Approved By: _____



Date: 01/14/00

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: HARZA Engineering Company of California
Project: Mills College/16198-EA
Sample Matrix: Water

Service Request: S2000068
Date Collected: 01/06/00
Date Received: 01/07/00

BTEX and TPH as Gasoline

Sample Name: MW-5
Lab Code: S2000068-004
Test Notes:

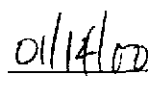
Units: ug/L (ppb)
Basis: NA

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
TPH as Gasoline	EPA 5030	CA/LUFT	50	1	NA	01/11/00	ND	
Benzene	EPA 5030	8021B	0.5	1	NA	01/11/00	ND	
Toluene	EPA 5030	8021B	0.5	1	NA	01/11/00	ND	
Ethylbenzene	EPA 5030	8021B	0.5	1	NA	01/11/00	ND	
Xylenes, Total	EPA 5030	8021B	1	1	NA	01/11/00	ND	

Approved By: _____



Date: _____



COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: HARZA Engineering Company of California
Project: Mills College/16198-EA
Sample Matrix: Water

Service Request: S2000068
Date Collected: NA
Date Received: NA

BTEX and TPH as Gasoline

Sample Name: Method Blank
Lab Code: S200111-WB1
Test Notes:

Units: ug/L (ppb)
Basis: NA

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
TPH as Gasoline	EPA 5030	CA/LUFT	50	1	NA	01/12/00	ND	
Benzene	EPA 5030	8021B	0.5	1	NA	01/12/00	ND	
Toluene	EPA 5030	8021B	0.5	1	NA	01/12/00	ND	
Ethylbenzene	EPA 5030	8021B	0.5	1	NA	01/12/00	ND	
Xylenes, Total	EPA 5030	8021B	1	1	NA	01/12/00	ND	

Approved By: _____

[Signature]

Date: _____

01/14/00

