Mills College
5000 MacArthur Blvd.
Oakland, CA 94613
www.mills.edu

MILLS

Keith Nowell PG, CHG
Hazardous Materials Specialist
Alameda County Environmental Health
1131 Harbor Bay Parkway
Alameda , CA 94502-6540

May 21, 2014

RE: **Soil and Groundwater Investigation**
Mills College
5000 MacArthur Blvd.
Oakland, California

Dear Mr. Nowell.

I declare, under penalty of perjury, that the information and/or recommendations contained in the attached document or report is true and correct to the best of my knowledge.

Sincerely,

Linda A. Zitzner
Associate VP for Operations
Off: 510-430-2024
Fax: 510-430-2306
lzitzner@mills.edu

REQUEST FOR CASE CLOSURE

Mills College
5000 MacArthur Boulevard
Oakland, California 94613

Alameda County Case No. RO000155
San Francisco Bay RWQCB No.: #01-0976

EquoLogic Project No. 411.01.05

Submitted to:

Mr. Keith Nowell
Alameda County Environmental Health
1131 Harbor Bay Parkway
Alameda, California 94502

Submitted by:

EquoLogic
1095 Branham Lane, Suite 204
San Jose, CA 95136
408 656-2505

May 23, 2014

SITE INFORMATION

Site:	**Mills College**
Site Address:	5000 MacArthur Blvd., Oakland, CA 94613
Responsible Party	Mills College
Address:	5000 MacArthur Blvd., Oakland, CA 94613
Global ID	T0600100899
Consulting Company:	EquoLogic – Mr. Lee Dooley (408) 656-2505
EquoLogic Project No.:	411.01.05
Contact/ Primary Agency:	Mr. Keith Newell, Alameda County Environmental Health
Case Number	RO000155
RWQCB Case No:	#01-0976
RWQCB Contact	Ms. Cherie McCaulou

INTRODUCTION

At the request of the Mills College, EquoLogic has prepared this *Request for Case Closure* for two petroleum hydrocarbon release locations on the campus. In an email dated March 26, 2014, Keith Newell of Alameda County Environmental (ACEH) stated that "Based on ACEHs review, the case appears to meet closure criteria under the State Water Resources Control Board's (SWRCBs) Low Threat Underground Storage Tank Case Closure Policy (LTCP)." ACEH requested that a *Request for Case Closure* be submitted to initiate the closure process.

This report contains a Site Description, a site history/chronology, and an evaluation of the suitability of site closure on the basis of the SWRCBs LTCP.

SITE DESCRIPTION

Two underground fuel storage tanks (USTs) were formerly located at Mills College (Figure 1). In October 1988, a 1,000-gallon fuel UST was removed from the College corporation yard (**Figure 2**). The corporation yard is located west of the main campus, adjacent to Seminary Avenue. The corporation yard is used for vehicle and equipment storage

In 1989, a small capacity, fuel oil UST was removed from the parking lot of the former Mills kitchen building in the central portion of the campus north of Mills Hall. This area is now developed as an open lawn and landscaped area referred to as Toyon Meadow (currently Holmgren Meadows) (**Figure 3**).

SITE HISTORY/CHRONOLOGY

Site investigations and quarterly groundwater monitoring have been reviewed to evaluate impacts resulting from the operation of the former USTs. Historical soil and groundwater analytical data and other supporting data are contained in Appendices A and B, respectively.

Maintenance Yard

In October 1988, a 1,000-gallon gasoline UST was removed from the College corporation yard. A report by Blaine Tech Services (November 1988) indicated that soil samples collected from beneath the base of the former UST had a strong petroleum hydrocarbon odor. A soil sample from a depth of 9 feet bgs contained 16,327 milligrams per kilogram (mg/kg) total petroleum hydrocarbons. A slight petroleum hydrocarbon odor was detected from 15 feet to 21 feet below ground surface (bgs) the maximum depth explored. The soil sample from 21 feet bgs contained 923 mg/kg TPH-G. It has been reported that 100 cubic yards of contaminated soil were excavated from the tank pit area and aerated on-site.

In a letter dated February 15, 1989, the ACEH requested investigation of the lateral and vertical extent of petroleum hydrocarbons in soil and groundwater. In June 1989, Kaldveer Associates installed three groundwater monitoring wells (MW-1 through MW-3) and two soil borings (EB-1 and EB-2) adjacent to the former UST (Figure 2). The highest concentrations of TPH-G were detected in the soil samples from boring EB-2 (1,200 mg/kg at 16 feet bgs). Kaldveer concluded that the majority of gasoline contamination in the unsaturated zone appeared to have been removed during soil excavation during tank removal. The three site monitoring wells were sampled in June 1989. TPH-G was only detected in the sample from well MW-1 (11,000 ug/l).

In May 1994, well MW-4 was installed (Figure 2) south of the former UST. In June 1995, well MW-5 was installed approximately 100 feet downgradient (west/southwest). Wells MW-1 through MW-5 were monitored periodically between June 1989 and January 2000. TPH-G was consistently only detected in well MW-1 immediately downgradient of the former UST. TPH-G concentrations ranged from 16,000 ug/l (June 1991) to 600 ug/l (April 1997). TPH-G was not detected in any samples from wells MW-4 or MW-5.

In October 2012, EquoLogic drilled boring EB-3 (Figure 2) adjacent to the former UST in order to establish current TPH-G concentrations in soil. TPH-G was detected up to 352 mg/kg. Wells MW-1 through MW-3 were sampled in October 2012 and April 2013. TPH-G

was detected only in well MW-1 (36 ug/l and 49 ug/l). Analytical data is summarized in Appendix B.

Toyon Meadows

In June 1989, a small capacity fuel-oil UST was removed from the area known as Toyon Meadows. Elevated levels of total petroleum hydrocarbons as diesel (TPH-D) were detected in soil samples from the excavation at the time of removal and approximately 250 cubic yards of soil were excavated from the vicinity of the former tank and disposed of off-site. Harza Consulting (Harza) conducted a soil and groundwater investigation in July 1989. Eleven soil borings (B-1 through B-11, Figure 3) were drilled in what was inferred as the downgradient direction (west). TPH-D was detected in soil samples at a depth of 12 to 15 feet below ground surface (bgs) for a distance of least 60 feet downgradient of the former tank location (Harza, 1994). Historic soil analytical data is presented in Appendix B.

Groundwater monitoring well MHW-1 was installed in July 1989 approximately 50 feet downgradient of the former tank location (Figure --). Two additional wells (MHW-2 and MHW-3) were installed in June 1991. Wells were sampled semi-annually between 1991 and 1995. TPH-D was detected in well MHW-1 at concentrations of less than 100 micrograms per liter (ug/l). TPH-D concentrations in well MHW-2, located adjacent to the former UST excavation ranged from 100 to 3,200 ug/l. TPH-D was not detected in samples from well MHW-3 located furthest downgradient. Groundwater analytical data is contained in Appendix B.

In May 1996, groundwater was collected by Harza from four Geoprobe borings (GP-1 through GP-4) located between the former tank excavation and the adjacent downgradient creek (see map in Appendix B.) TPH-D concentrations ranged from 75,000 ug/l in boring GP-1 located nearest to the former excavation to 200 ug/l in boring GP-3 located approximately 150 feet downgradient (see summary of analytical data, Appendix B).

In November 2012, EquoLogic drilled two Geoprobe borings (B-12 and B-13, Figure 3) in the area of the former UST excavation in order to establish current soil and groundwater conditions. The highest concentration of TPH-D in soil was 1,400 milligrams per kilogram (mg/kg) in the 15-foot sample of boring B-13. The highest concentration of TPH-D in groundwater was in the sample from boring B-13 at 9,460 ug/l.

EquoLogic performed groundwater sampling in October 2012 and April 2013 utilizing the existing three monitoring wells. The highest concentrations of TPH-D were detected in

groundwater samples from well MW-2M (renumber from MHW-2). TPH-D was detected at concentrations of 115 and 136 ug/l.

A meeting was held on November 15, 2013 with ACEH to discuss the possibility of case closure under the SWRCB low threat closure policy. It was concluded that the length of the TPH-D plume was not clearly established. It was agreed that groundwater samples should be collected between the existing groundwater monitoring wells and the creek located approximately 100 feet north of well MW-3M (Figure 3). On December 18, 2013, EquoLogic drilled three borings (B-14 through B-16, Figure 3) to depths of 15 to 20 feet bgs. No wet zones were identified in any of borings despite a historic depth to groundwater of approximately 13 feet bgs. Soil samples were collected from the bottom of each boring. Soil TPH-D was estimated below the laboratory reporting limit but above the machine detection limit ("J" value). All other parameters were below the laboratory and machine detection limits.

SITE CONCEPTUAL MODEL

The following section describes the sensitive receptors and hydrogeologic and contaminant conditions at the two release sites.

Sensitive Receptors

No active water supply wells are currently known to exist on the campus. EquoLogic requested site Well Completion Reports (Reports) from the California Department of Water Resources (DWR). DWR provided reports for four wells reportedly once located on the Mills College campus. The wells ranged in depth from 324 to 358 feet. One report indicated that the well was installed in 1930. The reports did not contain any specific location data. Sanborn maps dated 1950 show three water supply well locations. Two wells are shown approximately 500 feet north of Mills Hall (Area 1). A third well is shown approximately 600 feet south of Mills Hall (Area 2). No evidence of wells was observed in either area.

A well survey was requested from Alameda County public works agency (ACPWA). The ACPWA identified ten wells with an address of Mills College. Eight of the wells were groundwater monitoring wells associated with site environmental investigations. One well had unknown date of installation, depth, and usage. The well location was listed as "Behind Mill Pond." There are currently no ponds on campus. Another well also had an unknown date of installation and depth. The usage was listed as abandoned but not destroyed (ABN). There was no specific location indicated.

A creek is located along the western edge of Toyon Meadows (Figure 3).

Maintenance Yard

The former UST was located in the maintenance yard parking lot adjacent to a metal storage building (Figure ---). Borings in the maintenance yard encountered approximately 5 feet of sandy clay and silty sand overlying weathered bedrock. Groundwater was first encountered in boring EB-2 at 25 feet below grade. Depth to groundwater in wells MW-1 through MW-3 in April 2013 was approximately 17 feet below top of casing. Groundwater flow was to the southwest. A groundwater flow rose diagram is included on Figure ---.

Historic data indicated that the pre-1989 release was limited in area but extended vertically to greater than 21 feet bgs. Strong petroleum hydrocarbon odor was noted during drilling of boring EB-3 (10-22-12) from 17 to 25 feet bgs. Groundwater contamination has historically been centered on well MW-1 located immediately downgradient of the former UST. Groundwater is tightly held in the silty weathered bedrock. Petroleum hydrocarbons have not been detected in downgradient monitoring well MW-4 and MW-5.

Toyon Meadows

The groundwater plume beneath Toyon Meadows is concentrated in a grassy landscaped area. Borings in Toyon Meadow encountered five to seven feet of fill material, underlain by clay to a depth of 10 to 13 feet below grade. Soil beneath the clay consisted of sand and gravel with lenses of clay to the maximum depth explored of 23.5 feet. Groundwater was encountered at a depth of 12 to 13 feet below grade and stabilized in monitoring wells at depths of 10 to 13 feet. Groundwater flow was to the west toward the adjacent creek. A groundwater flow rose diagram is included on Figure 3.

Elevated concentrations of TPH-D have been detected within 40 feet of the former UST. TPH-D was detected at a concentration of 9,460 ug/l in a groundwater sample from boring B-13 collected in November 2012. Movement of petroleum hydrocarbons (TPH-D) has been primarily horizontal. TPH-D was detected in downgradient wells MW-1M and MW-3M at concentrations of 25.5 ug/l and 75.6 ug/l, respectively, in April 2013. Wells MW-1M and MW-3M are located approximately 60 feet and 120 feet, respectively, downgradient of the former UST.

CLOSURE CRITERIA

The following is an evaluation of the SWRCB Low Threat Closure Policy checklist;

General Criteria

a. *Is the unauthorized release located within the service area of public water system?* The site is located in the East Bay Municipal Utility District (EBMUD).

b. *The unauthorized release consists only of petroleum.* Soil and groundwater contaminants consist of TPH-D, TPH-G, benzene, toluene, ethylbenzene, and xylene.

c. *The unauthorized ("primary") release from the UST system has been stopped.* The two USTs were removed in 1988 and 1989.

d. *Free product has been removed to the maximum extent practicable.* Free product has not been encountered in any site wells.

e. *A conceptual site model that assesses the nature, extent, and mobility of the release has been developed.* See section above.

f. *Secondary source has been removed to the extent practicable.* Impacted soil was removed from the area of the USTs during tank removals in 1988 and 1989.

g. *Soil or groundwater has been tested for MTBE and results reported.* Soil and groundwater have been tested for MTBE.

h. *Does a nuisance exist, as defined by Water Code section 13050?* No complaints have been received regarding soil or groundwater contamination.

Media-Specific Criteria

Groundwater

The groundwater plume at the maintenance yard appears to be less than 100 feet in length. There is no free product. The nearest existing water supply well or surface water body is greater than 100 feet from the defined plume boundary. The release meets groundwater LTCP criteria (2) – see Appendix C.

The groundwater plume in Toyon Meadows appears to be less than 100 feet in length. There is no free product. The nearest existing water supply well is greater than 250 feet from the defined plume boundary. A creek is located approximately 150 feet downgradient of plume boundary. Recent borings indicate that the plume is stable and is not impacting the creek. The release meets groundwater LTCP criteria (5) – see Appendix C.

Petroleum Vapor Intrusion to Indoor Air

The groundwater plume at the corporation yard appears to be concentrated beneath the paved parking area. Site conditions most closely resemble Scenario 3B of the LTCP criteria (Appendix C). TPH-G was less than 100 mg/kg in the upper ten feet below ground surface (see data for boring EB-3, Appendix A). Benzene concentration in groundwater in site wells MW-1 though MW-3 was less than 100 ug/l (see data from 4/22/13, Appendix B).

The groundwater plume beneath Toyon Meadows is concentrated in a grassy landscaped area. Site conditions most closely resemble Scenario 3B of the LTCP criteria. TPH-D was less than 100 mg/kg in the upper ten feet below ground surface (see data for borings B-12 and B-13, Appendix A). Benzene concentration in groundwater in site wells MW-1M though MW-3M was less than 100 ug/l (see data from 4/22/13, Appendix B).

Direct Contact and Outdoor Air Exposure

Soil concentrations in the area of the maintenance yard release appear to meet the criteria in Table 1 for the specified depth below ground surface. Benzene, ethylbenzene, naphthalene, and TPH-G were not detected in soil samples from boring EB-3 in the 0 to 10-foot depth interval (see data for EB-3 Appendix A).

Soil concentrations in the area of the Toyon Meadows release also appear to meet the criteria in Table 1 (Appendix C) for the specified depth below ground surface. Benzene, ethylbenzene, and naphthalene were not detected in soil samples from borings B-12 and B-13 in the 0 to 10-foot depth interval.

CONCLUSIONS AND RECOMMENDATIONS

Groundwater monitoring for the first quarter 2013 and results of previous site investigations indicate that risks to public health and safety, and ecological receptors have been reduced to low levels. EquoLogic recommends that the site be assigned No Further Action Required status and all wells remaining be destroyed according to State and local regulations.

REMARKS

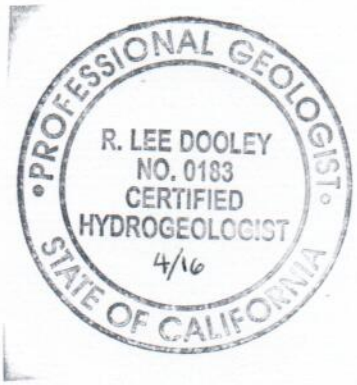
The descriptions, conclusions, and recommendations contained in this report represent EquoLogic's professional opinions based upon the currently available information and are arrived at in accordance with currently acceptable professional standards. This report is based upon a specific scope of work requested by the client. This report is intended only for the use of EquoLogic's Client and anyone else specifically listed on this report. EquoLogic will not and cannot be liable for unauthorized reliance by any other third party. Other than as contained in this paragraph, EquoLogic makes no express or implied warranty as to the contents of this report.

Please contact either of the undersigned at 408 656-2505 if you have questions.

Sincerely,

EquoLogic

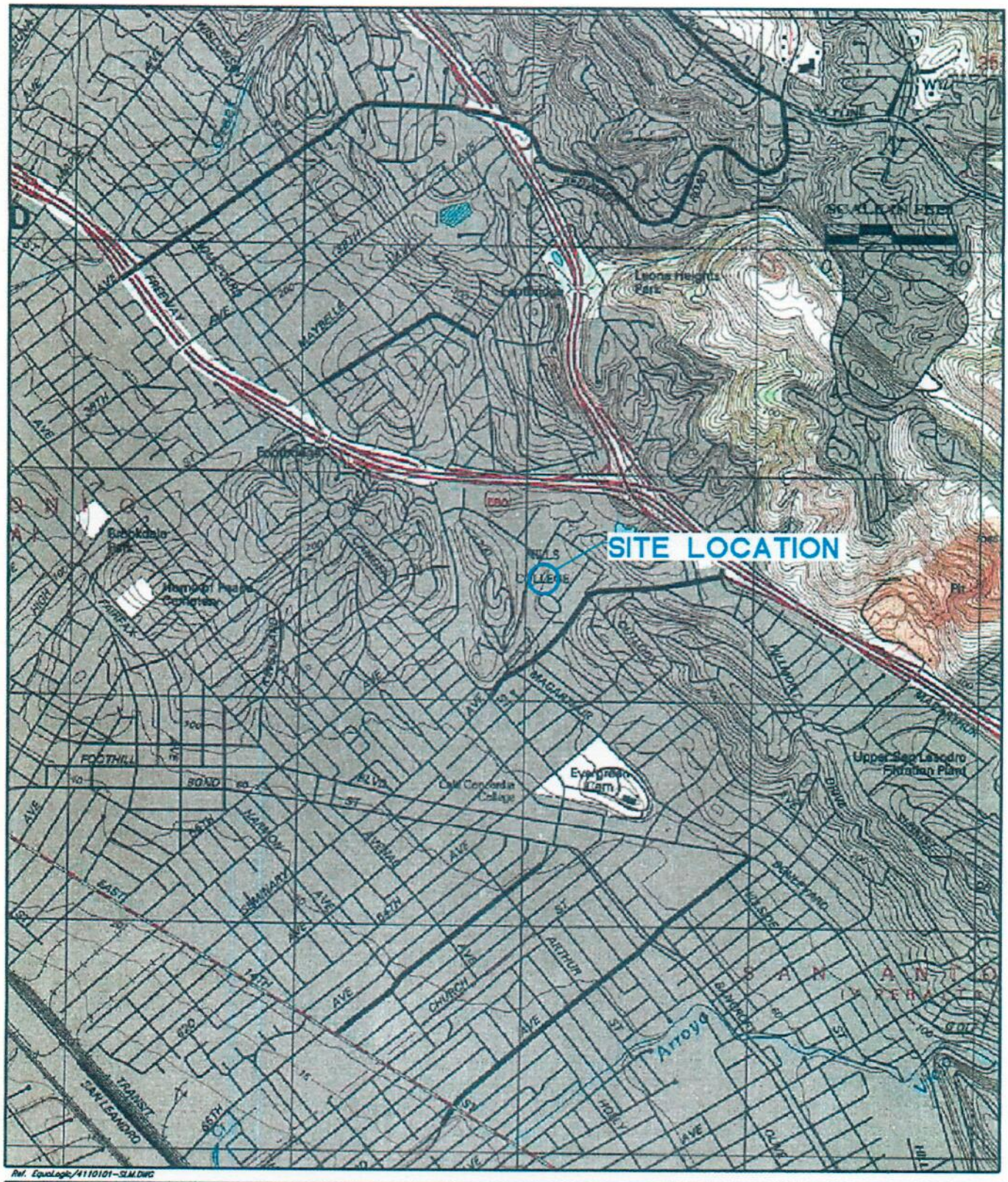
R. Lee Dooley
Certified Hydrogeologist



Attachments:

Figure 1 – Site Location Map
Figure 2 – Site Map – Corporation Yard
Figure 3 – Site Map – Toyon Meadows

Appendix A – Historic Soil Analytical Data
Appendix B – Historic Groundwater Analytical Data
Appendix C – LTCP Criteria



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SITE LOCATION MAP

MILLS COLLEGE
5000 MacArthur Boulevard
Oakland, California

FIGURE:
1
PROJECT:
411.01.01

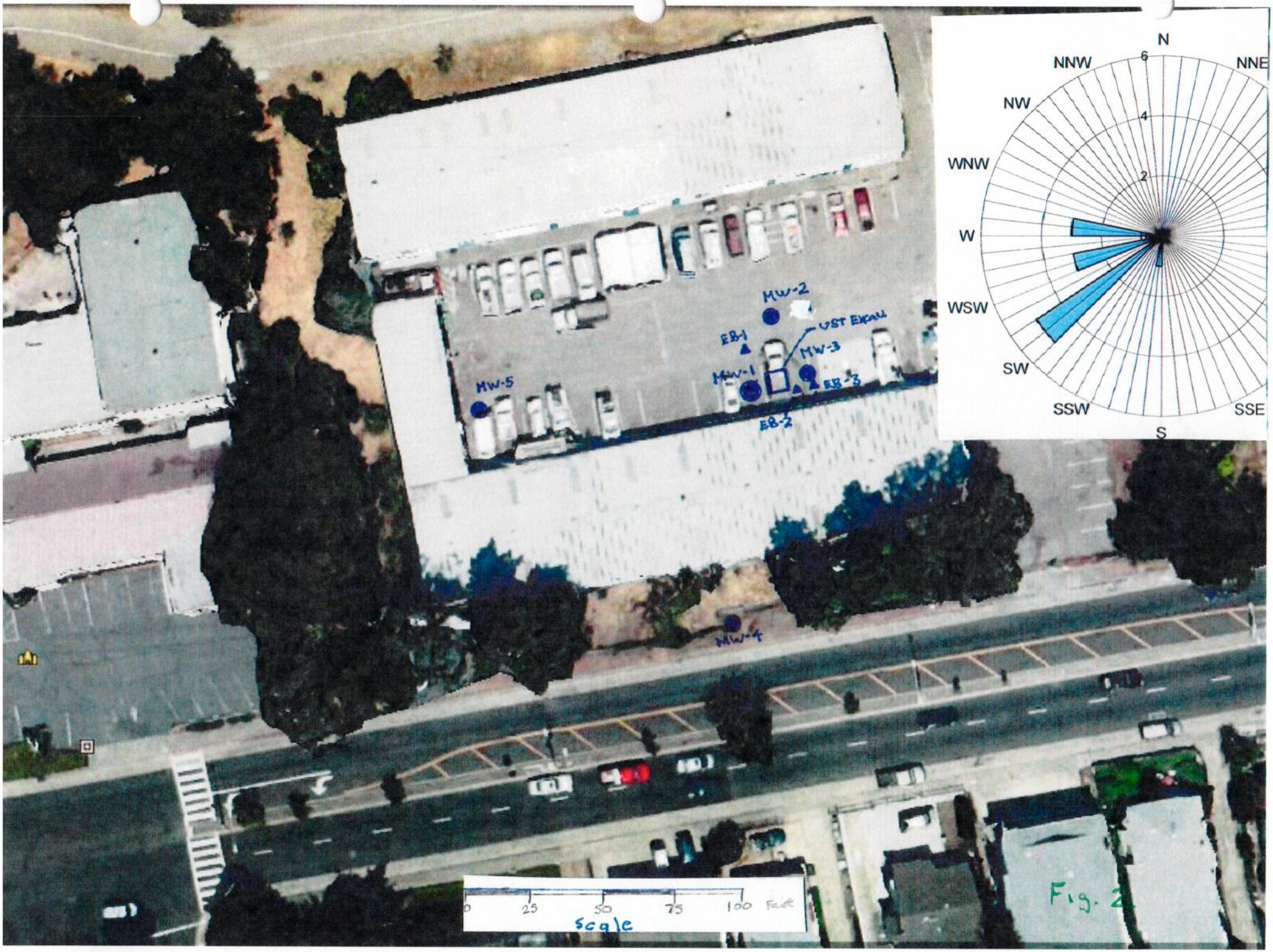

MW-2
EB-1
UST Excav
MW-3
MW-1
EB-3
MW-5
EB-2
MW-4
N
NNW
NNE
NW
WNW
W
WSW
SW
SSW
SSE
S
6
4
2
0
25
50
75
100
Feet
Scale

Fig. 2

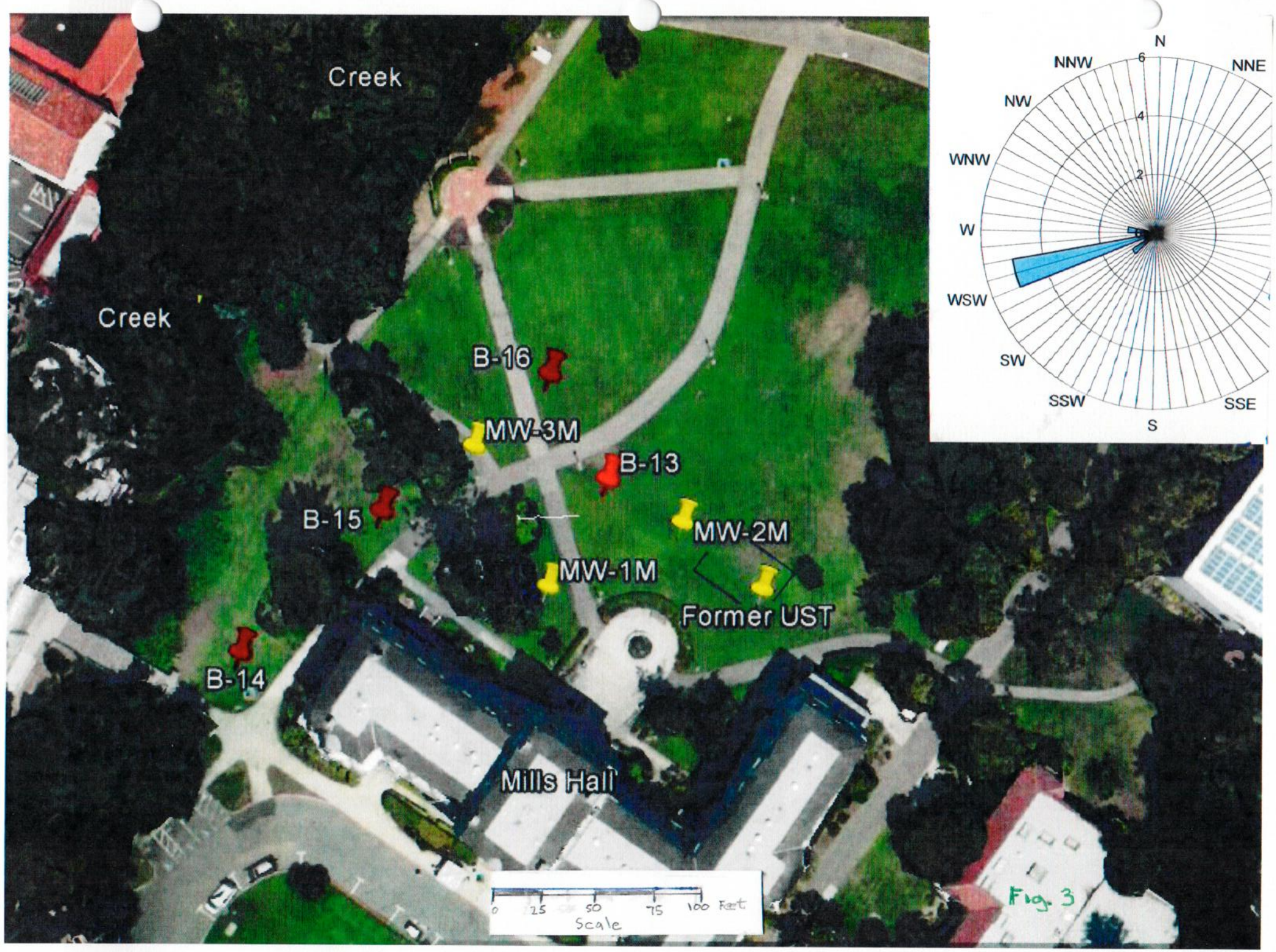

Creek
Creek
B-16
MW-3M
B-13
B-15
MW-2M
MW-1M
Former UST
B-14
Mills Hall
N
NNW
NNE
NW
WNW
W
WSW
SW
SSW
SSE
S
6
4
2
0
25
50
75
100
Feet
Scale

Fig. 3

Appendix A

Historic Soil Analytical Data

TABLE 2

ANALYTICAL RESULTS - SOIL
(reported in parts per million, mg/kg)

Sample Location & Depth(ft)	TPH Gasoline	Benzene	Toluene	Ethylbenzene	Xylenes
MW1-11	520.0	0.78	2.8	2.4	14.0
MW1-16	1.0	0.3	0.11	0.007	0.045
MW1-21	15.0	1.6	2.3	0.26	1.6
MW2-11	ND	0.002	0.002	ND	ND
MW2-16	ND	0.001	0.001	ND	ND
MW2-21	ND	ND	0.001	ND	ND
MW3-11	ND	0.015	0.001	ND	ND
MW3-16	ND	0.051	0.002	ND	0.005
MW3-21	ND	ND	ND	ND	ND
EB1-10.5	ND	0.005	0.002	ND	ND
EB1-15.5	ND	0.075	0.003	ND	ND
EB1-24	ND	0.003	0.002	ND	ND
EB2-11	580.0	7.6	50.0	13.0	72.0
EB2-16	1200.0	21.0	74.0	23.0	190.0
EB2-21	240.0	0.3	5.6	3.1	18.0

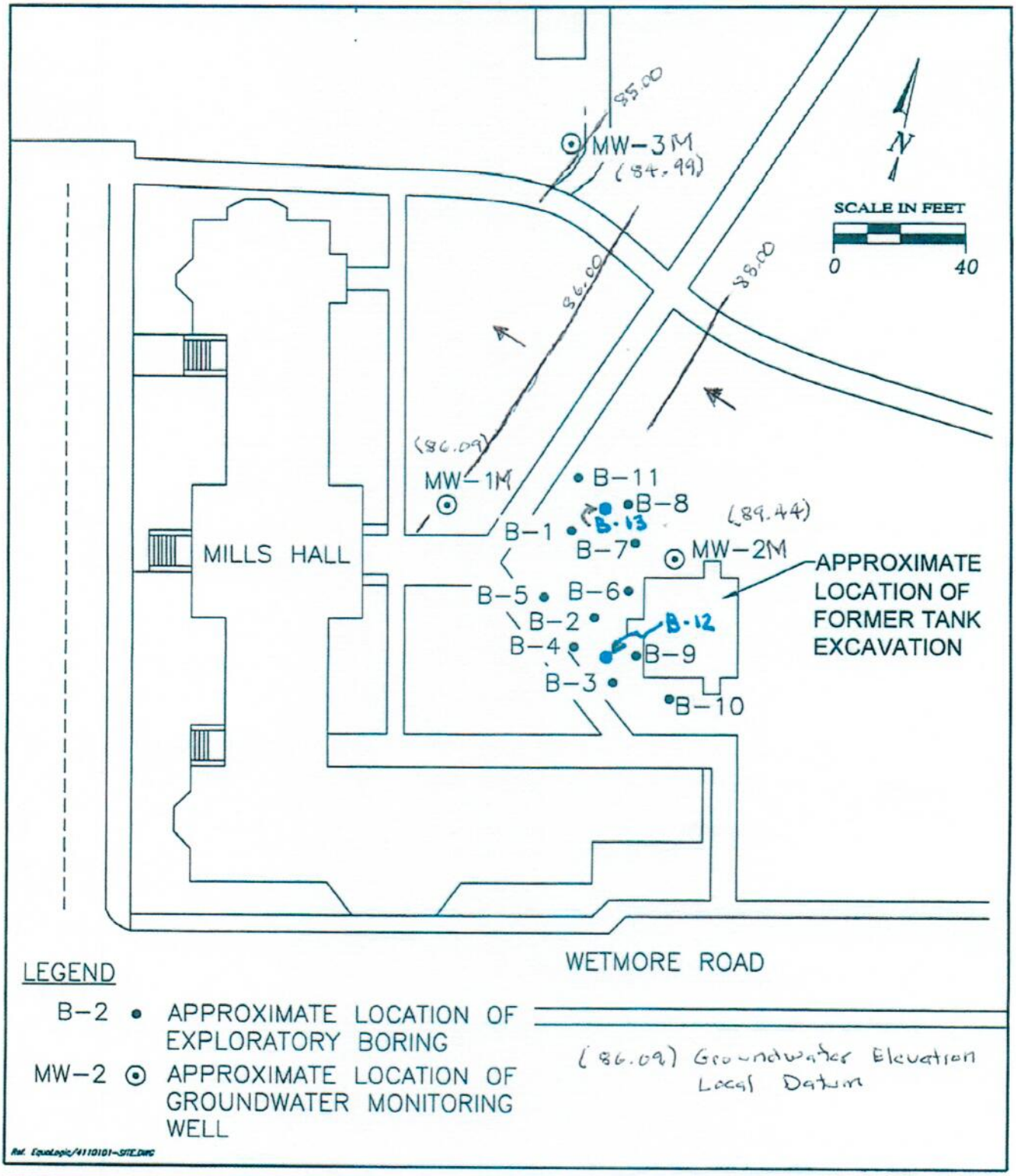
Notes:

TPH = Total Petroleum Hydrocarbons
ND = Not Detected; see laboratory reports for specific detection limits.

Toyon Meadows

TABLE 1
ANALYTICAL RESULTS - SOIL
(reported in parts per million, mg/kg)

Sample Location Number, and Collection Date	Petroleum Hydrocarbons as Diesel
June 28, 1989 - Initial Excavation Limit Samples	
SS-1, SS-2	480
SS-3, SS-4	1,900
July 17, 1989 - Soil Boring Samples	
B1-10'	190
B1-14'	1,600
B2-10'	ND
B2-13.5'	1,800
B3-10'	ND
B3-14'	60
B4-14.5'	1,700
B5-13.5'	640
B6-14'	630
B7-10'	240
B7-14.5'	240
B8-14'	11,000
B9-13'	250
B10-14.5'	2,700
B11-14'	16
July 18, 19, 1989 - Additional Excavation Closure Samples	
CS1-10'	ND
CS2-13'	5,000
CS3-10'	ND
CS4-12'	260
CS5-10'	ND
CS6-13'	570
CS7-10'	ND
CS8-12'	1,600
August 4 - 7, 1989 - City Sewer Trench Samples, South of Mills Hall	
SS-1, 20'	ND
SS-2, 20'	ND
June 4, 1991 - Soil Samples Collected During Installation of MHW-2 and MHW-3	
MHW-2, 12.5'	620
MHW-3, 11'	ND



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SITE PLAN TOYON MEADOWS

MILLS COLLEGE
5000 MacArthur Boulevard
Oakland, California

FIGURE: 3
PROJECT: 411.01.01

TABLE 1 - SUMMARY OF SOIL ANALYTICAL DATA
MILLS COLLEGE

Boring	Depth Feet	Date	B ug/kg	T ug/kg	E ug/kg	X ug/kg	1,2-Dibrm ug/kg	1,2-Dichlorm ug/kg	DIPE ug/kg	ETBE ug/kg	MTBE ug/kg	Napth ug/kg	TAME ug/kg	TBA ug/kg	TPH (C10-28) mg/kg
TOYON MEADOWS															
B-12	5	11/8/2012	<0.49	**1.5**	<0.49	**1.0**	<0.49	<0.49	<0.49	<0.49	<0.98	<0.98	<0.49	<0.98	<2.5
B-12	10	11/8/2012	<0.49	**0.62**	<0.49	<0.98	<0.49	<0.49	<0.49	<0.49	<0.98	<0.98	<0.49	<9.8	**3.17**
B-12	15	11/8/2012	<0.48	**0.55**	<0.48	<0.97	<0.48	<0.48	<0.48	<0.48	<0.97	<0.97	<0.48	<9.7	**5.12**
B-12	20	11/8/2012	<0.48	<0.48	<0.48	<0.96	<0.48	<0.48	<0.48	<0.48	<0.96	<0.96	<0.48	<9.6	**3.6**
B-12	25	11/8/2012	<0.48	<0.48	<0.48	<0.97	<0.48	<0.48	<0.48	<0.48	<0.97	<0.97	<0.48	<9.7	**9.3**
B-12	29	11/8/2012	<0.48	**1.5**	<0.48	**1.7**	<0.48	<0.48	<0.48	<0.48	<0.96	<0.96	<0.48	<9.7	**3.01**
B-13	5	11/8/2012	<0.50	<0.50	<0.50	<0.99	<0.50	<0.50	<0.50	<0.50	<0.99	<0.99	<0.50	<9.6	**4.02**
B-13	10	11/8/2012	<0.49	**1.5**	<0.49	**3.1**	<0.49	<0.49	<0.49	<0.49	<0.97	<0.97	<0.49	<9.7	**7.8**
B-13	15	11/8/2012	<170	<170	<170	<340	<170	<170	<170	<170	<340	**2910**	<170	<3400	**1400**
B-13	20	11/8/2012	<0.48	<0.48	<0.48	<0.97	<0.48	<0.48	<0.48	<0.48	<0.97	<0.97	<0.48	<9.7	**2.85**
B-13	22	11/8/2012	<0.49	<0.49	<0.49	<0.98	<0.49	<0.49	<0.49	<0.49	<0.98	**2.2**	<0.49	<9.8	**3.51**
MAINTENANCE YARD															TPH (C6-10)
EB-3	6	10/22/2012	<0.50	<0.50	<0.50	<1.0	<0.50	<0.50	<0.50	<0.50	<1.0	<1.0	<0.50	<10.0	<0.050
EB-3	10	10/22/2012	<0.48	<0.48	<0.48	<0.97	<0.48	<0.48	<0.48	<0.48	<0.97	<0.97	<0.48	<9.7	<0.048
EB-3	15	10/22/2012	**10.3**	<0.50	**2.7**	**5.7**	<0.50	<0.50	<0.50	<0.50	<1.0	**28.8**	<180	**27.7**	**129**
EB-3	20	10/22/2012	**3460**	**837**	**5390**	**24,800**	<180	<180	<180	<180	<350	**2490**	<180	<3500	**352**
EB-3	25	10/22/2012	**193**	**27.1**	**182**	**659**	<19	<19	<19	<19	<37	**65.3**	<19	<370	**10**

Notes

B	Benzene	DIPE	Di-isoproply ether	TPH (C10-28)	Total Petroleum Hydrocarbons
T	Toluene	ETBE	Ethyl tert-Butly Ether		
E	Ethylbenzene	MTBE	Methyl Tert Butyl Ether		Elevated concentrations
X	Xylene	Napth	Napthalene		
1,2-Dibrm	1,2-Dibromoethane	TAME	Tert-Amyl Methyl Ether		
1,2-Dichlorm	1,2-Dichloroethane	TBA	Tert Butyl Alcohol		

TABLE 1 - SUMMARY OF SOIL ANALYTICAL DATA
MILLS COLLEGE

Boring	Depth Feet	Date	B ug/kg	T ug/kg	E ug/kg	X ug/kg	1,2-Dibrm ug/kg	1,2-Dichlorm ug/kg	MTBE ug/kg	Napth ug/kg	TPH (C10-28) mg/kg
TOYON MEADOWS											
B-14	15	12/18/2013	<5.0	<5.0	<5.0	<10	<5.0	<5.0	<5.0	<5.0	6.95 J
B-15	15	12/18/2013	<4.9	<4.9	<4.9	<9.8	<4.9	<4.9	<4.9	<4.9	5.71 J
B-16	15	12/18/2013	<5.0	<5.0	<5.0	<9.9	<5.0	<5.0	<5.0	<5.0	4.87 J

Notes

B	Benzene	MTBE	Methyl Tert Butyl Ether
T	Toluene	Napth	Napthalene
E	Ethylbenzene	TPH	Total Petroleum Hydrocarbons
X	Xylene	J	Indicates an estimated value below the laboratory reportimg limit
1,2-Dibrm	1,2-Dibromoethane		
1,2-Dichlorm	1,2-Dichloroethane		

Attachment B

Historic Groundwater Analytical Data

TABLE 3

ANALYTICAL RESULTS - WATER
(reported in parts per million, mg/l)

Monitoring Well/Date	TPH Gasoline	Benzene	Toluene	Ethylbenzene	Xylenes
MW-1					
June, 1989	11.0	2.1	1.9	0.031	1.4
December, 1990	2.5	0.40	0.21	0.056	0.31
MW-2					
June, 1989	ND	ND	ND	ND	ND
December, 1990	ND	ND	ND	ND	ND
MW-3					
June, 1989	ND	ND	ND	ND	ND
December, 1990	0.05	0.011	ND	ND	ND

Notes:

TPH = Total Petroleum Hydrocarbons
ND = Not Detected; see laboratory reports for specific detection limits.

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): Dupicate sample analytical results

TABLE 2
Historical Ground Water Sample Analytical Results
Additional Site Investigation
Toyon Meadow, Mills College, Oakland, CA

Well	Date	TPHd ppm	TPH Oil ppm	Benzene ppm	Toluene ppm	Ethylbenzene ppm	Xylenes ppm
MHW-1/1A	June 1991	0.06	ND	ND	ND	ND	ND
	March 1992	ND	--	ND	ND	ND	ND
	October 1992	0.09	ND	ND	ND	ND	ND
	May 1994	ND	--	ND	ND	ND	ND
	October 1994	ND	--	ND	ND	ND	ND
	April 1995	0.06	--	0.002	0.0006	ND	ND
	October 1995	ND	--	ND	ND	ND	ND
MHW-2	June 1991	3.2	ND	ND	ND	ND	ND
	March 1992	0.1	--	ND	ND	ND	ND
	October 1992	0.61	ND	ND	ND	ND	ND
	May 1994	0.2	--	ND	ND	ND	ND
	October 1994	0.4	--	ND	ND	ND	ND
	April 1995	0.52	--	ND	ND	ND	ND
	October 1995	0.4	--	ND	ND	ND	ND
MHW-3	June 1991	ND	ND	ND	ND	ND	ND
	March 1992	ND	--	ND	ND	ND	ND
	October 1992	ND	ND	ND	ND	ND	ND
	May 1994	ND	--	ND	ND	ND	ND
	October 1994	ND	--	ND	ND	ND	ND
	April 1995	ND	--	0.0009	ND	ND	ND
	October 1995	ND	--	ND	ND	ND	ND

NOTES

TPHd: Total petroleum hydrocarbons as diesel
TPH Oil: Total petroleum hydrocarbons as oil
ppm: Parts per million or milligrams per liter
ND: Not detected at or above the laboratory method reporting limits
--: Not tested
Well MHW-1 was replaced by MHW-1A on May 2, 1994 prior to the monitoring event

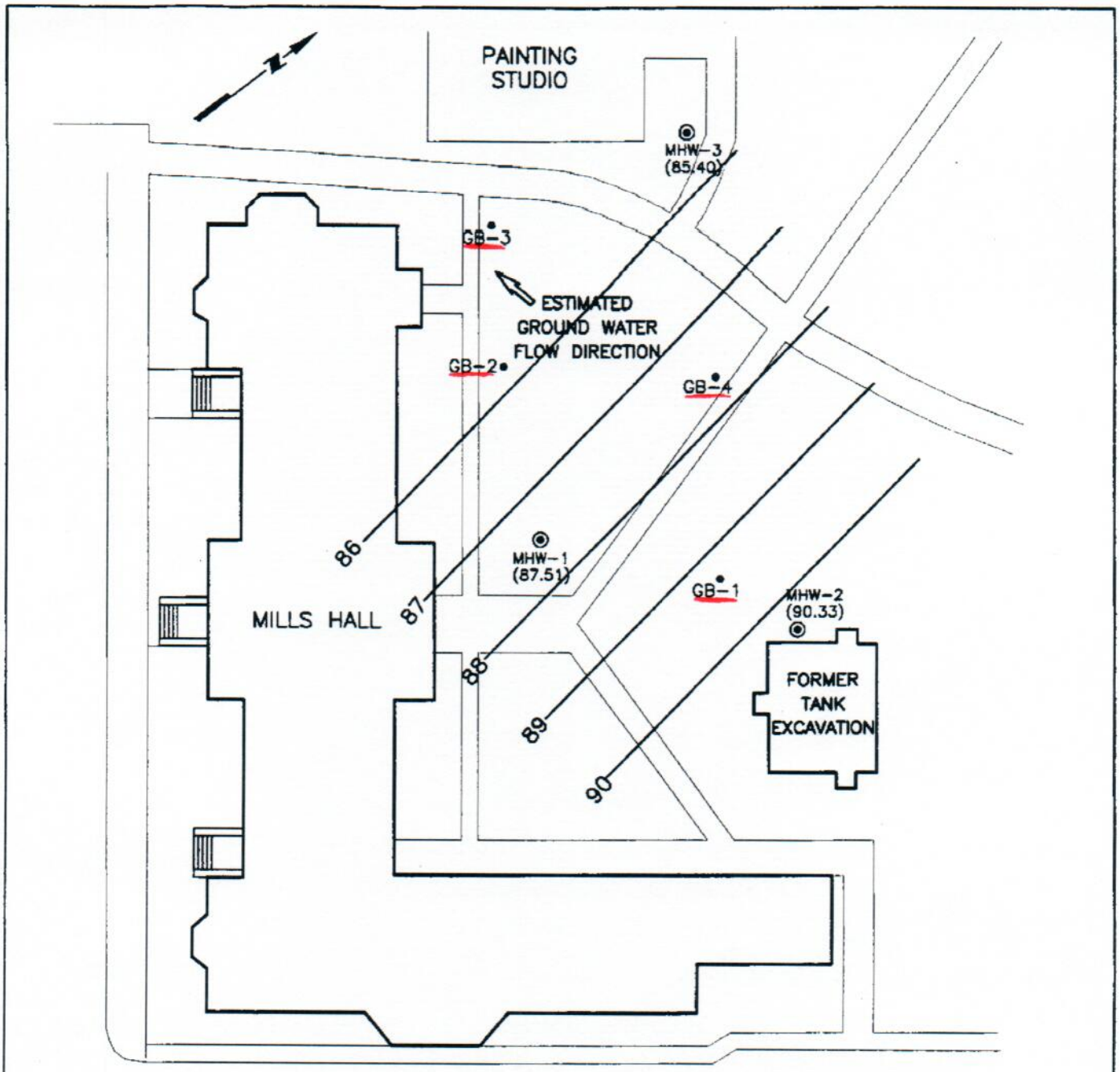
TABLE 3
Ground Water Grab Sample Analytical Results
Additional Site Investigation
Toyon Meadow, Mills College, Oakland, CA

May 1996

Sample ID	TPHd ppm	Benzene ppm	Toluene ppm	Ethylbenzene ppm	Xylenes ppm
GB-1	75.	0.0006	0.0058	0.0086	0.11
GB-2	0.09	ND	ND	ND	ND
GB-3	0.2	ND	ND	ND	ND
GB-4	0.06	ND	0.0007	ND	ND

NOTES

TPHd: Total petroleum hydrocarbons as diesel
ppm: Parts per million or milligrams per liter
ND: Not detected at or above the laboratory method reporting limits



LEGEND

MHW-3◉ APPROXIMATE LOCATION OF MONITORING WELL WITH RELATIVE GROUND WATER ELEVATION

GB-4• APPROXIMATE LOCATION OF GROUND WATER GRAB SAMPLE

90—— GROUND WATER CONTOUR 5/29/96

APPROXIMATE SCALE IN FEET

0 40 80

Base Provided By Mills College, Dated 3/88

6-96-2

Rev.	Drawn By	Chk'd By	Date
0	D.F.	D.A.	6/4/96

HARZA

SITE PLAN

MILLS HALL / TOYON MEADOW
Oakland, California

Figure 2

Project No. K275-G

TABLE 2 - SUMMARY OF GROUNDWATER ANALYTICAL DATA
MILLS COLLEGE

Boring	Date	B ug/l	T ug/l	E ug/l	X ug/l	1,2-Dibrm ug/l	1,2-Dichlorm ug/l	DIPE ug/l	ETBE ug/l	MTBE ug/l	Napth ug/l	TAME ug/l	TBA ug/l	TPH (C10-28) mg/l
TOYON MEADOWS														
MW-1 M	10/19/2012	<0.20	<0.20	<0.20	<0.46	<0.20	<0.20	<0.22	<0.22	<0.20	<0.50	<0.40	<2.4	**0.0333**
MW-2 M	10/19/2012	<0.20	<0.20	<0.20	<0.46	<0.20	<0.20	<0.22	<0.22	<0.20	<0.50	<0.40	<2.4	**0.115**
MW-3 M	10/19/2012	<0.20	<0.20	<0.20	<0.46	<0.20	<0.20	<0.22	<0.22	<0.20	<0.50	<0.40	<2.4	**0.0904**
B-12	11/8/2012	<0.20	<0.20	<0.20	<0.46	<0.20	<0.20	<0.22	<0.22	<0.20	<0.50	<0.40	<2.4	**0.0837**
B-13	11/8/2012	<0.20	<0.20	<0.20	<0.46	<0.20	<0.20	<0.22	<0.22	<0.20	**18**	<0.40	<2.4	**9.46**
MAINTENANCE YARD														TPH (C6-10)
MW-1	10/19/2012	**1.7**	<0.20	**0.21**	<0.46	<0.20	**0.56**	<0.22	<0.22	**0.32**	<0.50	<0.40	<2.4	**0.036**
MW-2	10/19/2012	<0.20	<0.20	<0.20	<0.46	<0.20	<0.20	<0.22	<0.22	<0.20	<0.50	<0.40	10.9	<0.025
MW-3	10/19/2012	<0.20	<0.20	<0.20	<0.46	<0.20	<0.20	<0.22	<0.22	0.20	<0.50	<0.40	<2.4	<0.025

Notes

B	Benzene	DIPE	Di-isoproply ether	TPH (C10-28)	Total Petroleum Hydrocarbons
T	Toluene	ETBE	Ethyl tert-Butly Ether		
E	Ethylbenzene	MTBE	Methyl Tert Butyl Ether		
X	Xylene	Napth	Napthalene		
1,2-Dibrm	1,2-Dibromoethane	TAME	Tert-Amyl Methyl Ether		
1,2-Dichlorm	1,2-Dichloroethane	TBA	Tert Butyl Alcohol		

TABLE 2 - SUMMARY OF GROUNDWATER ANALYTICAL DATA
MILLS COLLEGE

Boring	Date	B ug/l	T ug/l	E ug/l	X ug/l	1,2-Dibrm ug/l	1,2-Dichlorm ug/l	DIPE ug/l	ETBE ug/l	MTBE ug/l	Napth ug/l	TAME ug/l	TBA ug/l	TPH (C10-28) mg/l
TOYON MEADOWS														
MW-1 M	10/19/2012	<0.20	<0.20	<0.20	<0.46	<0.20	<0.20	<0.22	<0.22	<0.20	<0.50	<0.40	<2.4	**0.0333**
	4/22/2013	<0.20	<0.20	<0.20	<0.46	<0.20	<0.20	<0.22	<0.22	<0.20	<0.50	<0.40	<2.4	**0.0255**
MW-2 M	10/19/2012	<0.20	<0.20	<0.20	<0.46	<0.20	<0.20	<0.22	<0.22	<0.20	<0.50	<0.40	<2.4	**0.115**
	4/22/2013	<0.20	<0.20	<0.20	<0.46	<0.20	<0.20	<0.22	<0.22	<0.20	<0.50	<0.40	<2.4	**0.136**
MW-3 M	10/19/2012	<0.20	<0.20	<0.20	<0.46	<0.20	<0.20	<0.22	<0.22	<0.20	<0.50	<0.40	<2.4	**0.0904**
	4/22/2013	<0.20	<0.20	<0.20	<0.46	<0.20	<0.20	<0.22	<0.22	<0.20	<0.50	<0.40	<2.4	**0.0756**
B-12	11/8/2012	<0.20	<0.20	<0.20	<0.46	<0.20	<0.20	<0.22	<0.22	<0.20	<0.50	<0.40	<2.4	**0.0837**
B-13	11/8/2012	<0.20	<0.20	<0.20	<0.46	<0.20	<0.20	<0.22	<0.22	<0.20	**18**	<0.40	<2.4	**9.46**
MAINTENANCE YARD														TPH (C6-10)
MW-1	10/19/2012	**1.7**	<0.20	**0.21**	<0.46	<0.20	**0.56**	<0.22	<0.22	**0.32**	<0.50	<0.40	<2.4	**0.036**
	4/22/2013	**3.6**	<0.20	**0.81**	<0.46	<0.20	**0.55**	<0.22	<0.22	**0.33**	<0.50	<0.40	<2.4	**0.049**
MW-2	10/19/2012	<0.20	<0.20	<0.20	<0.46	<0.20	<0.20	<0.22	<0.22	<0.20	<0.50	<0.40	**10.9**	<0.025
	4/22/2013	<0.20	<0.20	<0.20	<0.46	<0.20	<0.20	<0.22	<0.22	<0.20	<0.50	<0.40	**9.1**	<0.025
MW-3	10/19/2012	<0.20	<0.20	<0.20	<0.46	<0.20	<0.20	<0.22	<0.22	0.20	<0.50	<0.40	<2.4	<0.025
	4/22/2013	<0.20	<0.20	<0.20	<0.46	<0.20	<0.20	<0.22	<0.22	0.20	<0.50	<0.40	<2.4	<0.025

Notes

B	Benzene	DIPE	Di-isoproply ether	TPH (C10-28)	Total Petroleum Hydrocarbons as diesel
T	Toluene	ETBE	Ethyl tert-Butly Ether		
E	Ethylbenzene	MTBE	Methyl Tert Butyl Ether	TPH (6-10)	Total Petroleum Hydrocarbons as gasoline
X	Xylene	Napth	Napthalene		
1,2-Dibrm	1,2-Dibromoethane	TAME	Tert-Amyl Methyl Ether	ug/l	Microgarms per liter
1,2-Dichlorm	1,2-Dichloroethane	TBA	Tert Butyl Alcohol	mg/l	

Attachment C

LTCP Criteria

It is a fundamental tenet of this low-threat closure policy that if the closure criteria described in this policy are satisfied at a petroleum unauthorized release site, attaining background water quality is not feasible, establishing an alternate level of water quality not to exceed that prescribed in the applicable Basin Plan is appropriate, and that water quality objectives will be attained through natural attenuation within a reasonable time, prior to the expected need for use of any affected groundwater.

If groundwater with a designated beneficial use is affected by an unauthorized release, to satisfy the media-specific criteria for groundwater, the contaminant plume that exceeds water quality objectives must be stable or decreasing in areal extent, and meet all of the additional characteristics of one of the five classes of sites listed below. A plume that is "stable or decreasing" is a contaminant mass that has expanded to its maximum extent: the distance from the release where attenuation exceeds migration.

Groundwater-Specific Criteria

(1) a. The contaminant plume that exceeds water quality objectives is less than 100 feet in length.
   b. There is no free product.
   c. The nearest existing water supply well or surface water body is greater than 250 feet from the defined plume boundary.

(2) a. The contaminant plume that exceeds water quality objectives is less than 250 feet in length.
   b. There is no free product.
   c. The nearest existing water supply well or surface water body is greater than 1,000 feet from the defined plume boundary.
   d. The dissolved concentration of benzene is less than 3,000 micrograms per liter (µg/l), and the dissolved concentration of MTBE is less than 1,000 µg/l.

(3) a. The contaminant plume that exceeds water quality objectives is less than 250 feet in length.
   b. Free product has been removed to the maximum extent practicable, may still be present below the site where the release originated, but does not extend off-site.
   c. The plume has been stable or decreasing for a minimum of five years.
   d. The nearest existing water supply well or surface water body is greater than 1,000 feet from the defined plume boundary.
   e. The property owner is willing to accept a land use restriction if the regulatory agency requires a land use restriction as a condition of closure.

(4) a. The contaminant plume that exceeds water quality objectives is less than 1,000 feet in length.
   b. There is no free product.
   c. The nearest existing water supply well or surface water body is greater than 1,000 feet from the defined plume boundary.
   d. The dissolved concentration of benzene is less than 1,000 µg/l, and the dissolved concentration of MTBE is less than 1,000 µg/l.

(5) a. The regulatory agency determines, based on an analysis of site specific conditions that under current and reasonably anticipated near-term future scenarios, the contaminant plume poses a low threat to human health and safety and to the environment and water quality objectives will be achieved within a reasonable time frame.

Appendix 3
Scenario 3 - Dissolved Phase Benzene Concentrations in Groundwater
(Low concentration groundwater scenarios with or without oxygen data)
(1 of 2)

Defining the Bioattenuation Zone Without Oxygen Data or Oxygen < 4%

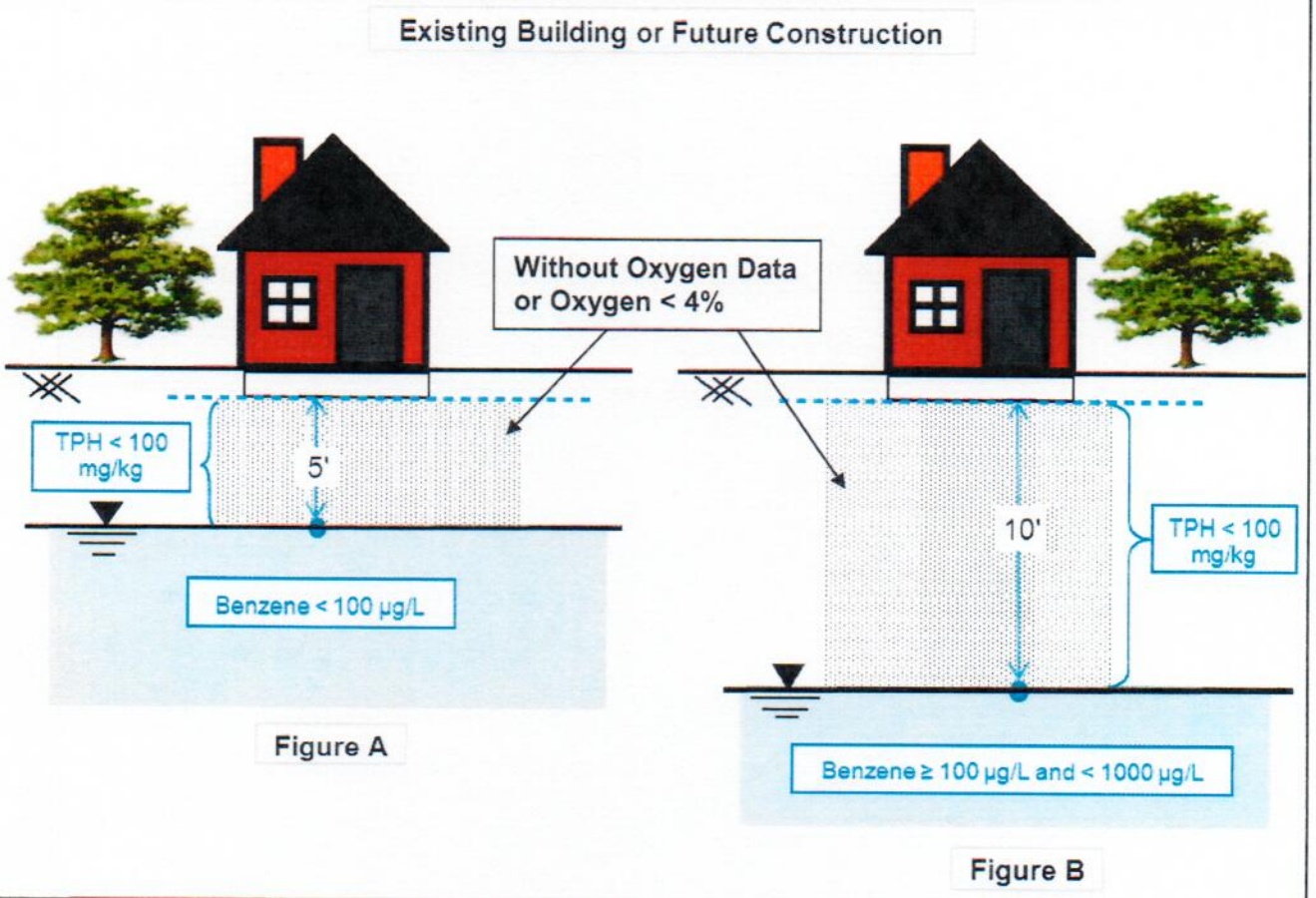


Figure A

Figure B

Required Characteristics of Bioattenuation Zone for Sites Without Oxygen Data or Where Oxygen is < 4%

Figure A: 1) Where benzene concentrations are less than 100 µg/L, the bioattenuation zone:

a) Shall be a continuous zone that provides a separation of at least 5 feet vertically between the dissolved phase Benzene and the foundation of existing or potential buildings; and
b) Contain Total TPH (TPH-g and TPH-d combined) less than 100 mg/kg throughout the entire depth of the bioattenuation zone.

Figure B: 1) Where benzene concentrations are equal to or greater than 100 µg/L but less than 1000 µg/L, the bioattenuation zone:

a) Shall be a continuous zone that provides a separation of at least 10 feet vertically between the dissolved phase Benzene and the foundation of existing or potential buildings; and b) Contain Total TPH (TPH-g and TPH-d combined) less than 100 mg/kg throughout the entire depth of the bioattenuation zone.

3. Direct Contact and Outdoor Air Exposure

This policy describes conditions where direct contact with contaminated soil or inhalation of contaminants volatized to outdoor air poses a low threat to human health. Release sites where human exposure may occur satisfy the media-specific criteria for direct contact and outdoor air exposure and shall be considered low-threat if they meet any of the following:

a. Maximum concentrations of petroleum constituents in soil are less than or equal to those listed in Table 1 for the specified depth below ground surface (bgs). The concentration limits for 0 to 5 feet bgs protect from ingestion of soil, dermal contact with soil, and inhalation of volatile soil emissions and inhalation of particulate emissions. The 5 to 10 feet bgs concentration limits protect from inhalation of volatile soil emissions. Both the 0 to 5 feet bgs concentration limits and the 5 to 10 feet bgs concentration limits for the appropriate site classification (Residential or Commercial/Industrial) shall be satisfied. In addition, if exposure to construction workers or utility trench workers are reasonably anticipated, the concentration limits for Utility Worker shall also be satisfied; or

b. Maximum concentrations of petroleum constituents in soil are less than levels that a site specific risk assessment demonstrates will have no significant risk of adversely affecting human health; or

c. As a result of controlling exposure through the use of mitigation measures or through the use of institutional or engineering controls, the regulatory agency determines that the concentrations of petroleum constituents in soil will have no significant risk of adversely affecting human health.

Table 1

Concentrations of Petroleum Constituents in Soil That Will Have No Significant Risk of Adversely Affecting Human Health

Chemical	Residential		Commercial/ Industrial		Utility Worker
	0 to 5 feet bgs mg/kg	Volatilization to outdoor air (5 to 10 feet bgs) mg/kg	0 to 5 feet bgs mg/kg	Volatilization to outdoor air (5 to 10 feet bgs) mg/kg	0 to 10 feet bgs mg/kg
Benzene	1.9	2.8	8.2	12	14
Ethylbenzene	21	32	89	134	314
Naphthalene	9.7	9.7	45	45	219
PAH[1]	0.063	NA	0.68	NA	4.5

Notes:
1. Based on the seven carcinogenic poly-aromatic hydrocarbons (PAHs) as benzo(a)pyrene toxicity equivalent [BaPe]. Sampling and analysis for PAH is only necessary where soil as affected by either waste oil or Bunker C fuel.
2. The area of impacted soil where a particular exposure occurs is 25 by 25 meters (approximately 82 by 82 feet) or less.
3. NA = not applicable
4. mg/kg = milligrams per kilogram