3/23/94

SOIL AND GROUND WATER TESTING REPORT FOR FORMER GRIMIT AUTO AND REPAIR SITE STID #553 1970 SEMINARY AVENUE OAKLAND, CALIFORNIA

STID 553

Hoexter Consulting, Inc. 734 Torreya Court, Palo Alto, California 94303 (415) 494-2505

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TRANSMITTAL

TO Alameda County - Envt. Health
80 Swan Way, Room 200
Oakland CA 94621

DATE 4/12/94
VIA US Mail
FAX NO. _____

ATTENTION Tom Peacock

PROJECT 1970 Seminary
Oakland CA

JOB NO. E-10-1-019

DESCRIPTION Report - 3/23/94

Number of pages, including cover page, if FAX _____

COMMENTS Submitted at request of Mr. Doyle Grimit, "responsible party"

ACTION

_____ As requested
__X__ For your use
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_____ Other_____

COPY TO _____

BY D F Hoexter
David F. Hoexter

If enclosures are not as noted, kindly notify us at once

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Geology / Engineering Geology / Environmental Studies

HOEXTER CONSULTING, INC.
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March 23, 1994

E10-1-019
HCEnvtRpts:Seminary 1970Rpt

Mr. Doyle Grimit
14366 Lark Street
San Leandro, California 94578

RE: SUBSURFACE INVESTIGATION
FORMER GRIMIT AUTO AND REPAIR - STID 553
1970 SEMINARY AVENUE
OAKLAND, CALIFORNIA

Dear Mr. Grimit:

Enclosed is our soil and ground water testing report for the property located at 1970 Seminary Avenue, Oakland, California. The report contains a description of our investigation, results of soil and ground water sample analyses, and our conclusions and recommendations regarding site environmental quality. The general scope of investigation was presented in our revised confirming agreement dated December 9, 1993, and our work plan dated December 17, 1993.

We appreciate the opportunity to provide services to you on this project and trust this report meets your needs at this time. If you have any questions, or require additional information, please do not hesitate to call.

Very truly yours,

HOEXTER CONSULTING, INC.

David F. Hoexter, RG/CEG/REA
Principal

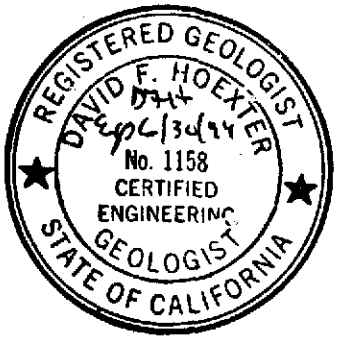
SOIL AND GROUND WATER
TESTING REPORT

For

Former Grimit Auto and Repair
STID 553
1970 Seminary Avenue
Oakland, California

To

Mr. Doyle Grimit
14366 Lark Street
San Leandro, California 94578



March 23, 1994

David F. Hoexter, RG/CEG/REA
Principal

Hoexter Consulting, Inc. 734 Torreya Court, Palo Alto, California 94303 (415) 494-2505

EXECUTIVE SUMMARY

Mr. Doyle Grimit, requested that Hoexter Consulting perform this soil and ground water testing program as part of his compliance with Alameda County's requirement for site investigation following removal of underground storage tanks at the site. Previously obtained data were evaluated, a site and vicinity reconnaissance was conducted, a detailed work plan prepared, ground water monitoring wells were installed, developed, and sampled, and a nearby irrigation well was sampled. Finally, this report was prepared.

Results of the sampling program indicate that petroleum hydrocarbons as gasoline, purgeable aromatic compounds (BTEX), and oil are present in soils within the near vicinity of the former underground tanks, and locally at a relatively shallow depth elsewhere on the site. These compounds are also present in ground water at the site, concentrated at one monitoring well located down-gradient of the former source area. The two additional monitoring wells exhibit very low to non-detect levels of petroleum hydrocarbons.

Active soil or ground water remediation is not recommended for this site. An evaluation of the feasibility of passive in-situ bioremediation is recommended. Paving of unpaved areas of the site, which overlie the former underground storage tanks, is recommended, to reduce ground water infiltration.

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SOIL AND GROUND WATER TESTING REPORT FOR FORMER GRIMIT AUTO AND REPAIR SITE STID #553 1970 SEMINARY AVENUE OAKLAND, CALIFORNIA

I. INTRODUCTION

This report presents the results of an investigation of soil and ground water quality at the "Grimit Auto and Repair" site, located at 1970 Seminary Avenue, on the southern corner of the Harmon Avenue intersection, in Oakland, California. The project location is shown on the Site Location Map, Figure 1, and the Topographic Map, Figure 2.

This investigation has been conducted in response to requirements for subsurface investigation, specifically a County of Alameda Department of Environmental Health letter to the property owner, Mr. Doyle Grimit, dated October 8, 1993. The purpose of this investigation has been to collect soil and ground water samples to evaluate the on-site soil and ground water quality.

The scope of services generally provided during this investigation consisted of collecting and analyzing soil and ground water samples from one pre-existing and two newly installed ground water monitoring wells. The soil and ground water samples were analyzed for total petroleum hydrocarbons as gasoline and for purgeable aromatic compounds (BTEX), and for total recoverable petroleum hydrocarbons ("waste oil"). Sampling locations and site layout are shown on Figure 3, Site Plan.

Note that additional material presented in our December 17, 1993 work plan, such as waste manifests, is not included in this report. Please refer to the work plan for this information.

II BACKGROUND

A. Location and Site Description

The project site is located at 1970 Seminary Avenue, at the southern corner of the Seminary Avenue - Harmon Avenue intersection, in Oakland, Alameda County, California (Figure 1). The property is bordered by Seminary Avenue on the northwest and by Harmon Avenue on the northeast, and by residences to the southeast and southwest. The neighborhood generally consists of single family residences and one, two or three- story apartment houses. A commercial retail shopping district is located along East 14th Street, approximately five blocks to the southwest.

The Grimit Auto site is on the order of 50 by 100 feet in plan dimension. The site consists of the service building with attached canopy, and a small detached storage building. Although this building has the appearance of a pump house, Mr. Grimit states that there never has been a domestic or irrigation well on the site. The former tank excavations have been backfilled to the adjacent grade. Figure 3 indicates the locations of pertinent site features, including the existing buildings and former UST locations. The tank excavations are also indicated.

B. Site Operation and Ownership

The site was formerly operated by Grimit Auto and Repair Service. The site is currently occupied by an auto electric and general repair facility, Amor's Auto Electric Repair. Amor's Auto Electric Repair is a tenant of the site, and is not a responsible party to the release.

The property is owned by Mr. Doyle Grimit, the former site operator and listed responsible party. Mr. Grimit's address is 14366 Lark Street, San Leandro, California 94578, and his telephone number is (510) 357-5133.

C. Site History

According to Mr. Grimit, four - approximately 550 gallon steel tanks were installed on the site in the 1930's. These or replacement tanks were used until fueling service was discontinued, on September 30, 1989. Three of the tanks were used to store gasoline. The fourth tank was used to store waste oil. To our knowledge, there are currently no operating or additional abandoned underground tanks on the property.

There are no known estimates of quantity of fuel or waste oil lost.

D. Site Closure and Excavations

The following discussion is based primarily on information and copies of documents and analytical data provided by Mr. Doyle Grimit, former operator of the property. Additional information was also provided by discussions with Mr. Thomas F. Peacock, Supervising HMS with the Hazardous Materials Division of the Alameda County Department of Environmental Health, Mr. Wayne Wellock of Petro Tech, Inc., and with Mr. Grimit. Relevant documents are listed in the References section of this report.

Site closure was initiated on November 17, 1989. Closure was conducted by Petro Tech, of Santa Rosa, California, under permit to Alameda County, Department of Environmental Health. Mr. Larry Seto of the Alameda County Department of Environmental Health witnessed the tank excavation.

The tanks were constructed of steel. Holes were observed in two of the tanks. The inerted tanks were transported under manifest by H & H Ship Service, San Francisco, California, and disposed of at the Levin Metals Corporation, Richmond, California, as scrap metal. Soil in the excavation appeared stained. Soil was not excavated, or excavated soils were temporarily returned to the excavations. Ground water was not encountered.

On May 16, 1991, Petro Tech overexcavated the waste oil pit to dimensions of approximately 7 by 10 by 7.5 feet deep. A total of approximately 20 cubic yards of soil was removed and stockpiled on site. Further excavation was limited due to the immediate proximity of the adjacent property line and service building. Water was not present in the pit. The four side walls were sampled, at a depth of approximately five feet below the ground surface. The pit bottom was sampled at two locations. A single composite sample of the stockpile was also obtained. The contaminated soil was disposed of by the Remco, Richmond, California facility as "non-hazardous petroleum contaminated soils".

The excavations were backfilled with clean, imported soils.

Analytical test results of the confirmation testing are discussed in a later section of this report.

There were no reported unusual problems encountered during the tank closure or site excavation, other than the limited area available for excavation.

E. Subsurface Investigations - Site

One ground water monitoring well, and three exploratory borings were advanced at the site during August, 1990, and documented in a report by Kaldveer Associates (1990). The Kaldveer report is titled "Soil and ground Water Testing Report for 1970 Seminary Avenue, Oakland, California", and is dated September 28, 1990. The Kaldveer investigation consisted of advancing three soil borings, two in the vicinity of the former waste oil tank, and one through the backfill of one of the fuel tanks; and drilling and installing one ground water monitoring well at a fourth location. The approximate boring and well locations are shown on Figure 3 of this report.

An initial sample round of the monitoring well was conducted by Kaldveer for the 1990 report. Supplemental excavation of the waste oil tank pit was conducted on May 16, 1991. Hoexter Consulting provided three subsequent quarterly ground water sampling events, in January, April, and August, 1982.

F. Summary of Previous Soil Sampling

Previous soil sampling test results are included in our December, 1993 Work Plan. The results are summarized in the following discussion.

Confirmation samples from the initial tank removal were obtained by Trans Tech Consultants, of Santa Rosa, California, under contract to Petro Tech. A total of seven soil samples were obtained from below the tanks, and variously tested for gasoline, oil and grease, heavy total hydrocarbons, volatile organic compounds, and organic lead. Five of the seven samples were obtained from below the three gasoline tanks. The maximum detected total petroleum hydrocarbons as gasoline (TPH-G) was 21 mg/kg (equivalent to parts per million, or ppm), with two samples non-detect. Purgeable aromatic compounds (BTXE) were also detected, although generally present at relatively low levels. Organic lead was not detected in one sample, from the middle gasoline tank. Total oil and grease (TOG) was detected in the two waste oil tank samples, at 5,500 and 7,200 ppm, with lower detected levels of extractable petroleum hydrocarbons, diesel and motor oil. Of the volatile organic compounds, only purgeable aromatic compounds were detected.

The subsequent Kaldveer Associates soil investigation analytical testing was limited to TPH-g and TOG. TPH-g was tested for only in one boring extended through the backfill of the former fuel tanks, and ranged from 0.5 to 4 to 50 ppm. TOG was detected in both test borings adjacent to the former waste oil tank, at a maximum level of 4,200 ppm at a depth of 10 feet, but decreasing to non-detect and 150 ppm at 16 feet.

Confirmation sampling of the subsequent waste oil tank pit overexcavation side walls and bottom, and a composite of the excavated soil, were also conducted. Total oil and grease was detected on the order of several thousand ppm, with a maximum of 15,000. TOG was detected in both side walls and the excavation bottom. Other TPH and purgeable aromatic compounds were also detected. In addition, analysis of eight RCRA heavy metals was conducted. Various detections of metals, which most likely are attributable to naturally occurring levels, were made.

G. Subsurface Investigations - Site Vicinity

According to Mr. Thomas Peacock, Alameda County Health Care Services Agency, UST Oversight Program Supervising HMS, there are no reported site investigations within the site vicinity which are close enough to the site to provide useful information.

III. SCOPE OF SERVICES

The work performed during this investigation consisted of the following tasks:

1. Review of previous investigations and information on the site.

2. Site reconnaissance to locate monitoring well locations and utilities.

3. Discussions with the property owner and the contractor who removed the tanks, and with Mr. Thomas F. Peacock, Supervising Hazardous Hazardous Materials Specialist, Alameda County Department of Environmental Health, UST Local Oversight Program.

4. Preparation of a work plan, dated December 17, 1993, for review and approval by Alameda County. The work plan was approved by letter dated January 4, 1994.

5. Drilling of two exploratory borings with a truck-mounted auger rig, to drilled depths of 20.0 and 35.0 feet and sampled depths of 21.5 and 36.5 feet, for soil and ground water sample collection. Installation of two ground water monitoring wells. Sampling of the one existing and two new monitoring wells. Water samples were obtained by using a teflon bailer in the developed and purged monitoring wells.

6. Sampling of one existing irrigation well in the near-site vicinity.

7. Analysis of soil and ground water samples by a contract analytical laboratory.

8. Evaluation of the data and preparation of this report.

IV. TOPOGRAPHIC AND GEOLOGIC SETTING

A. Topographic and Cultural Setting

The Grimit Auto and Repair property is situated at an elevation of approximately 41 feet MSL (Figure 2). The site is located on the East Bay Plain, a gently westward sloping feature underlain by a sequence of alluvial deposits with a maximum thickness of 1,100 feet. Ground water underlying the East Bay Plain flows westward from recharge areas along the eastern fringe of the plain, and locally from the central portion, towards San Francisco Bay (Alameda County Flood Control and Water Conservation District, 1988). The ground surface slopes gently to the west southwest, at an average gradient of one to 250 (vertical to horizontal).

The nearest perennial stream is Arroyo Viejo, approximately 5,000 feet southwest of the site. Local, ephemeral drainages are located approximately 400 feet to the northwest and 2,000 feet to the southeast. It is possible that additional, buried, stream channels are

located in the site vicinity. The site is approximately 4000 feet from tidal estuaries connected to San Francisco Bay.

The immediate site vicinity is generally not considered to be an area of active ground water recharge. However, some recharge may occur from the above-referenced ephemeral streams following periods of rainfall.

B. Regional Geology

The subject property is situated upon deposits of Quaternary age alluvium (Radbruch, 1969). According to Alameda County Flood Control and Water Conservation District (1988), the shallow alluvium in the general site vicinity is generally from 10 to 50 feet thick, and is mostly unsaturated, with localized perched ground water zones. It thus yields little to wells, and is not a ground water source except locally for generally non-potable domestic use. Ground water in the deeper aquifer of the East Bay Plain is confined, due to the deposition of clay and other fine-grained material over beds of relatively coarse, water-bearing sand and gravel.

C. Well Survey

A survey of registered wells within a 0.5 mile radius of the site was conducted at our request by the Alameda County Public Works Agency. The survey is conducted by a computer search of registered wells. A total of 29 wells located at nine sites, including Monitoring Well MW-1 at the Grimit site, were identified. The wells in the site vicinity are primarily cathodic protection and monitoring wells located along and southwest of East 14th Street, and are generally more than 1500 feet from the site. There is one up-gradient irrigation and one down-gradient abandoned production well. The wells are summarized as follows:

Location		Distance and Direction	Comments
1.	1970 Seminary	0	Site
2.	2232 Seminary	500 ft NE	150 ft deep irrigation well, up-gradient
3.	62nd Ave and Hilton	1000 ft E	120 ft deep cathodic protection well, up-gradient
4.	5525 Bancroft	1500 ft NW	20-37 ft deep up-gradient boring and monitoring wells
5.	55th and E. 15th St.	1500 ft WSW	120 ft deep down-gradient cathodic protection
6A.	5725 E. 14th St.	1800 ft SW	204 ft deep abandoned production well
6B.	5725 E. 14th St.	1800 ft SW	15-20 ft deep monitoring wells, down-gradient
7.	5625 E. 14th St	2000 ft SW	20-24 ft deep monitoring wells, down-gradient
8.	6630 E. 14th St	2000 ft SSE	23-51 ft deep monitoring wells and 202 ft deep boring, down-gradient
9.	Tevis and 62nd Ave	2200 ft SSW	120 ft deep down-gradient cathodic protection

There is thus only one permitted active irrigation or production well within a one-half mile radius of the site. This well, located at 2232 Seminary Avenue, is located in the regional up-gradient direction from the site.

It should be noted that one additional well was brought to our attention during the course of the investigation. The well is apparently not on the County data base. The well is reported by the owner to be approximately 80 feet deep, is used for occasional irrigation, and is located approximately 250 feet west of the site.

V. FIELD INVESTIGATION

A. Monitoring Well Rationale

Two monitoring wells were proposed for installation. The wells were located as shown on Figure 3, in the approximate regional down gradient ground water flow direction. This coverage was initially intended to provide information on the site ground water flow direction, as well as provide representative ground water quality data for this portion of the site. In our opinion the wells provide reasonably representative ground water sample coverage of the site.

The wells were intended to be completed in the same manner as the pre-existing monitoring well installed by Kaldveer Associates. Thus, ground water data from the three wells would be consistent. However, during the drilling of Monitoring Well MW-2, an apparently thin saturated zone was noted by the driller at a depth of approximately 15 to 16 feet below the ground surface (BGS). The well was completed dry at the pre-determined depth of 35 feet, and screened so the 15-16 foot zone would be exposed to the well screen. While drilling Monitoring Well MW-3, the same relatively shallow zone was noted. Recognizing that ground water flow information would be compromised, a field decision was made to complete this well at a shallower depth (20 feet), to screen only this apparently perched zone.

B. Drilling and Sampling

The field investigation was initiated on January 28, 1994, and concluded on the same day. The borings and wells were completed by PC Exploration, Inc. of Roseville (Fremont facility), California. The driller holds a valid C-57 contractor's license. The monitoring well permit issued by Zone 7, Alameda County Flood Control and Water Conservation District is included in Appendix A.

The investigation consisted of drilling a total of two soil borings at the approximate locations shown on Figure 3, and the completion of the borings as monitoring wells, under permit to Alameda County Flood Control and Water Conservation District, Zone 7. The initial boring (MW-2) was drilled to a depth of 35.0 feet, and the sampler was driven an additional 1.5 feet. The second boring was drilled to a depth of 20.0 feet, and the sampler driven an additional 1.5 feet. The borings were drilled with a Mobile Model B-61 drill rig, equipped with 8-inch diameter hollow stem augers. Soils encountered during drilling were classified in the field by our geologist by visual examination, in accordance with the Unified Soil Classification System. A log of the borings is presented in Appendix A.

Soil samples were collected with a two-inch diameter Modified California type split spoon sampler at approximately five-foot intervals to the total depth drilled. The samples were retained in stainless steel tubes (liners). The sampler was driven with a standard 140-pound hammer falling 30 inches. The number of blows required to drive the sampler the final 12 inches of an 18-inch drive, or the actual distance driven if less than 18 inches, is

recorded as the penetration resistance (blows/foot) on the boring logs. The samples were examined for logging, sealed with teflon tape and teflon lids, secured with "duct tape", labeled and immediately placed in refrigerated storage. A chain-of-custody form was initiated in the field and accompanied the samples to the analytical laboratory.

The augers were steam-cleaned prior to drilling, and the sampler was thoroughly cleaned with tri-sodium phosphate (TSP) between samples, to reduce the potential for cross-contamination.

C. Well Construction Details

Details of the well installation are included in Appendix A, along with the boring log for each well. Well construction commenced immediately following the drilling and sampling of each boring.

Well MW-2 was completed to approximately 35 feet below the ground surface using 20 feet of 0.02 inch slotted Schedule 40 PVC well screen packed with 2/12 washed Monterey Lapis Lustre sand filter material. The sand was placed to approximately two feet above the top of the perforations. The well seal consisted of 12-inches of 3/3-inch, hydrated bentonite pellets added to the top of the filter pack, and then filling the remaining annular space with a Portland cement grout mixture. Well MW-3 was similarly completed, excepting that the total depth was 20.0 feet, and 10.0 feet of screen was placed. Each well was completed at the ground surface with a locking cap and traffic-rated water-tight box, standing slightly above grade.

D. Well Development

In addition to the two newly-installed monitoring wells, pre-existing well MW-1 was redeveloped, due to the length of time since its most recent sampling event, and to produce similar conditions for the sampling of all three wells. Well development was performed on February 7, 1994, using a well development rig operated by West Hazmat Drilling Corporation of Newark, California. The rig is specifically designed to develop monitoring wells, and utilizes a tight-fitting surge block on a rod followed by rapid bailing and /or pumping, to efficiently develop the well.

The wells produced poorly, and were each evacuated after a total of five (5) to 10 gallons of water was removed. Approximately six and one-half (6.5) gallons was removed from each of MW-1 and MW-2, and 33 gallons from MW-1.

E. Well Sampling

The wells were sampled on February 11, 1994 by Jack Forsythe, staff geologist, supervised by David F. Hoexter. Depth to ground water was initially measured with an electronic well sounder. A new, disposable teflon bailer was used to purge and sample each well.

A sounding with the bailer for floating product was initially conducted. A hydrocarbon sheen was observed in MW-1. Neither floating product nor a hydrocarbon sheen were observed in MW-2 or MW-3. A minimum of four casing volumes of water were then purged from each well with a teflon bailer prior to sampling. Temperature, pH and conductivity were monitored while each well volume was purged. Ground water samples were collected from the well with the teflon bailer immediately following the purging. The samples were decanted into laboratory-supplied containers, labelled and placed in refrigerated storage immediately after sampling.

In addition, an irrigation well located approximately 250 feet west of the site was sampled with permission of the owner. According to the owner, the well is 80 feet deep. The well appeared to be four inches in diameter. The well was initially purged by flowing the well, and recording ground water parameters. The depth to water could not be measured, and so an assumed depth of 20 feet was utilized to calculate a well volume. Four well volumes were removed by flow through a discharge hose, prior to valving the flow to a minimal flow, and filling the sample bottles. The sample was transmitted to the laboratory by separate chain of custody; otherwise, it was handled in the manner described above.

The samples were delivered under chain of custody control to the laboratory on the day of sampling. Purge water collected during the well sampling was contained in appropriately labeled containers, and transported to the laboratory for appropriate disposal. Well purge and sampling logs are attached to this report as a part of Appendix D.

The well development and sampling equipment were cleaned with a TSP solution, and rinsed with water, and then purified water. Ground water sample bottles were supplied by the analytical laboratory.

F. Surveying

The wells were surveyed on February 11, 1994 to the City of Oakland datum by Andreas P. Deak, California Licensed Land Surveyor 4739. A copy of the well elevation survey is included in Appendix B.

G. Subsurface Conditions

As noted, the wells were installed by two consultants, Monitoring Well MW-1 by Kaldveer Associates, and wells MW-2 and MW-3 by Hoexter Consulting. For the convenience of the reader, the Kaldveer MW-1 boring log has been interpreted and converted to Hoexter Consulting format, and included in Appendix A with the logs of the two Hoexter Consulting well installations. Some differences may exist in description and interpretation of the soil conditions at the site between the two individuals who logged the exploratory borings.

The attached boring logs and related information (Appendix A) depict location-specific subsurface conditions encountered during our field investigation. The approximate location of the monitoring well was determined by taping and should be considered accurate only to the degree implied by the method used. The passage of time could result in changes in the surface or subsurface conditions due to natural occurrences or human intervention.

The ground surface at the site, other than at the locations of the former tank excavations, is generally covered with approximately two inches of asphalt. The asphalt is underlain by a sequence of alluvial sediments, consisting primarily of silty and clayey sand and gravel, with lenses of clay and silt. As shown on Figure 4, Cross Section A-A', the lenses and strata are laterally variable, although continuous in a general sense across the site. There is greater variability between wells MW-1 and MW-2 than between MW-1 and MW-3. Wells MW-1 and MW-2 penetrate a sequence of strata characterized by silty and clayey sand and gravel. Well MW-3 indicates the presence of a greater amount of clay. Although sand and gravel are present in wells MW-1 and MW-2, samples are generally stiff to very stiff and dense to very dense, and based on appearance and the very slow rate of recovery, of relatively low permeability. We observed no indications of more permeable strata or lenses.

Odors were observed in soil samples from all three wells, as noted on the individual boring logs.

Ground water was initially noted by the Kaldveer Associates geologist while drilling in MW-1 at a depth of approximately 24 feet below the ground surface (BGS). The driller reported a small quantity of water in MW-2 at a depth of 15 to 16 feet. Water was observed at this depth in MW-3 as well. Based on these observations, it appears that a shallow perched ground water zone is present at approximately 15 feet, which was present but not observed by Kaldveer Associates during the installation of MW-1, or was not present due to the drought conditions of the time of drilling. This observation is supported by an evaluation of ground water levels in monitoring wells within the general site vicinity. A well completed to 51 feet exhibits a depth to water of 36 feet. Of eleven wells completed to 20 to 26 feet, nine exhibited depth to water of eight to 10 feet and two from 16 to 17 feet. These measurements occurred during a period of drought (1990 through 1992).

Table 1 summarizes measured ground water levels in developed monitoring wells at the site. The effects of increased rainfall during the winter of 1992-93 are clearly evident in the February, 1994 data. Stabilized ground water conditions, as measured on February 28, 1994, support the interpretation of a shallow perched zone. These measurements show that ground water in MW-1 and MW-2, completed to 35 feet BGS, is on the order of six to nine feet deeper than ground water in MW-3, completed to 20 feet. There appears to be a clear downward flow from the perched zone penetrated by MW-3 to the slightly deeper zone penetrated by wells MW-1 and MW-2. The most-recently recorded ground water data are presented on Figure 5.

As the three wells are not completed in the same manner, a definitive ground water gradient cannot be determined. An approximate gradient direction is shown on Figure 5, based on wells M-1 and MW-2.

Please note that notwithstanding the apparent equilibrium levels attained by the ground water in the three monitoring wells, ground water levels may vary within the season and from year to year. Although ground water flow parameters were not determined, on a qualitative basis flow to the well during development and sampling was relatively slow, suggesting a very low permeability at the site.

VI ANALYTICAL RESULTS

A. Laboratory Procedures

The ground water samples were analyzed by Sequoia Analytical of Redwood City, California. The samples were analyzed for total petroleum hydrocarbons as gasoline (TPH-G) using EPA Method 5030/8015; for purgeable aromatic compounds (BTEX) using EPA Method 8020; and for oil and grease (total recoverable petroleum oil, TOG) using Standard Method 418.1 / 5520 C&F (IR with cleanup).

B. Analytical Results

1. Soil Samples

Results of the soil sample analyses from wells MW-1 and MW-2 are presented on Table 2, and the laboratory reports are attached to this report as Appendix C. Petroleum hydrocarbons were detected primarily in the 10.5-11.0 foot sample from MW-2. TPH-G was detected at a concentration of 910 mg/kg (equivalent to parts per million, or ppm), with TOG present at 38 ppm. Benzene was not detected. The other purgeable aromatic

compounds, toluene, xylenes, and ethylbenzene, were detected at from 0.76 to 6.1 ppm. Very low levels of TPH-G and BTEX (benzene, toluene, xylenes, and ethylbenzene) compounds were variously detected in the remaining four soil samples.

2. Ground Water Samples

The results of the ground water chemical analyses are presented on Table 3 and are attached to this report as a part of Appendix D. Analytical results of all previous testing, including the August, 1990 sampling by Kaldveer Associates following well installation, are also included. The current analytical results indicate that hydrocarbons as gasoline were detected in monitoring wells MW-1 and MW-2, as follows: at a concentration of 1,800 ppm in MW-1 and 0.130 ppm in MW-2. The purgeable aromatic compounds benzene, toluene, xylenes and ethylbenzene were generally detected at various concentrations in the two wells, although benzene was not detected in MW-1. Oil and grease was detected in MW-1 at a concentration of 16 ppm.

As noted, detected petroleum hydrocarbons were very low and non-detect in wells MW-2 and MW-3.

The MW-1 test results do not appear to represent a clear trend, as they indicate an apparent increase in TPH-G, an anomalous absence of benzene, and a decrease in TOG. In our opinion, based on past test results, the non-detect benzene result is probably not representative of ground water at this location. The apparent changes in MW-1 from previous testing may be due to the extensive well re-development of the well prior to the current sampling event.

It should be noted that floating product was not observed in the initial sounding of the wells, although a sheen (floating film) of oil was observed in Monitoring Well MW-1. This film was present in the bailer after purging four well volumes.

VII DISCUSSION

The purpose of this investigation was to obtain ground water flow and occurrence information, and representative soil and ground water samples, and to analyze these samples for the compounds most likely to be introduced to the site from nearby or on-site sources. Soil samples have been obtained from two newly installed monitoring wells, and ground water samples have been obtained from all three monitoring wells and a nearby irrigation well. The monitoring wells were placed in representative locations to obtain representative soil and ground water samples, as well as ground water flow data.

A. Soil Quality

Soil quality of previous tank removal confirmation testing and exploration by Kaldveer Associates indicated that although the sources of contamination had been removed, petroleum hydrocarbon-contaminated soil, generally on the order of several tens ppm TPH and several thousand ppm TOG, remained in former excavation side walls and below the base of the excavations, particularly in the former waste oil tank excavation. In general, it was not feasible to further excavate at the waste oil tank, due to the presence of hard, resistant strata and the adjacent service building and property line.

An elevated level of TPH-G (910 ppm) and of TOG (38 ppm) in the 10.5 foot sample from MW-2 indicates a degree of lateral transmission of petroleum hydrocarbons through the shallow perched zone. Based on our observations and experience, this sample in our opinion represents a higher than average contaminant level for this portion of the site. This

sample was obtained from a depth which is currently six feet higher than the stabilized water table in the well. Based on the BTEX analyses, the sample is highly degraded. Other soil samples indicate non-detect to very low petroleum hydrocarbon levels. Although obtained from below the current ground water table, the relatively low permeability of the soils and low-levels of TPH indicate in our opinion that relatively highly contaminated TPH is limited to the immediate former tank vicinity and to localized occurrences within the shallow strata on the order of 10 to 15 foot depth.

B. Ground Water Quality

Ground water contamination in the vicinity of Monitoring Well MW-1 remains elevated. Although there is no measurable separate phase (floating) product, TPH-G has varied from 54 to 2000 ppm, and most recently was 1800 ppm. It is possible, although in our opinion *unlikely* (based on the initial boring logs of MW-1 and EB-1, 2, and 3) that free-phase hydrocarbons exist in the shallow perched water zone identified while installing wells MW-2 and MW-3.

The initial sampling round for wells MW-2 and MW-3 indicates very low to non-detect levels of petroleum hydrocarbons in ground water.

The sampling of the nearby down- to lateral-gradient irrigation well also did not detect gasoline and BTEX compounds, indicating that it has not been impacted by the site.

C. Ground Water Conditions

As discussed, a field decision was made to complete well MW-3 at a shallower depth than the preceding two monitoring wells. Thus, a three-point configuration of ground water elevations was not obtained, and the ground water flow direction cannot be accurately determined. The definitively higher ground water level in MW-3 indicates a shallow, perched water zone, with an apparent down-ward flow gradient to the deeper zone or zones screened in wells MW-1 and MW-2. Although relatively permeable sediments were identified at a depth on the order of 15 feet in MW-2, no such permeable sediments were identified in MW-3.

Based on the relative elevations in wells MW-1 and MW-2, and the generalized regional ground surface slope to the southwest, it is our estimation that ground water flow in the intermediate strata at the site is generally to the southwest, essentially parallel to Seminary Avenue. Based on the nearly three foot difference in ground water levels from MW-1 to MW-2, it appears that ground water flow may occur through lenses or fractures which are poorly or not interconnected.

As noted elsewhere in this report, scattered wells in the site vicinity penetrate to greater depths than those explored at the site. Depth to ground water data from two of these wells is available in the Alameda County data base. Depth of water is 61 and 79 feet in 102 and 204 foot deep wells, respectively. This data, however, may be based on initial ground water while drilling, and does not necessarily represent stabilized levels. The irrigation well located approximately 250 feet west of the site produced at a minimum rate of five gallons per minute, with the rate controlled by valving. The deeper ground water aquifer is undoubtedly of greater permeability than the shallow water-bearing zones identified in this investigation.

VIII CONCLUSIONS AND RECOMMENDATIONS

Elevated levels of petroleum hydrocarbons continue to be present in the vicinity of Monitoring Well MW-1. The two down-gradient wells exhibit very low to non-detect levels of petroleum hydrocarbons. It is our opinion that the majority of potential source material is most-likely removed from the site. However, contaminated soil remains in place, and through passage of direct rainfall and/or presence of contaminated soils within the relatively shallow perched ground water, probably continues to contribute to the site's ground water contamination. The processes of contaminant leaching and transmission are in our opinion very slow at the site, due to the relatively low apparent soil permeability.

In our opinion, based on the general lack of ground water utilization and on the sampling of the nearby irrigation well, beneficial ground water resources at the site and vicinity are not significantly impacted by the Grimit site. Removal of all of the remaining source material would require excavation of at least one half of the site, and doubtless would include demolition of the existing structure, which is utilized by a small auto-repair facility which would be forced to move from the site. It might also be necessary to excavate onto the neighboring residential property to the southeast, and possibly under adjacent streets. A very extensive supplemental subsurface investigation would be required to determine the precise vertical and lateral extent of soil contamination. In our opinion, the benefit of extensive further investigation and excavation would be minimal, and the costs would be prohibitive.

Due to the presence of relatively impermeable soils, a program of in-situ soil remediation would most likely be cost prohibitive and of dubious benefit. In addition, due to the low production of the site's monitoring wells, it is apparent that ground water extraction would be of minimal benefit.

In our opinion, a program of passive in-situ bioremediation in the existing Monitoring Well MW-1 might be of benefit and reasonable cost. Passive in-situ bioremediation involves stimulating the native soil bacteria to utilize the petroleum hydrocarbon contaminants as a food source for energy and to produce additional cell mass. Ground water extraction and/or control would not be conducted. Nutrients, including oxygen and possibly nitrogen and phosphorus, are introduced to the zone of contamination. The advantages of this method are its relative low cost, it can occur in-situ, and it does not rely on ground water extraction. It will be necessary to perform a feasibility evaluation of this, and possibly other methods of remediation, before a decision is made to proceed.

We also recommend paving of the former underground storage tank excavation backfill, to reduce the direct infiltration of water to the residual contaminated sediments.

IX LIMITATIONS

This report has been prepared according to generally accepted geologic and environmental practices. No other warranty, either expressed or implied as to the methods, results, conclusions or professional advice provided is made. It should be recognized that certain limitations are inherent in the evaluation of subsurface conditions, and that certain conditions may not be detected during an investigation of this type. If you wish to reduce the level of uncertainty associated with this study, we should be contacted for additional consultation.

The analysis, conclusions and recommendations contained in this report are based on site conditions as they existed at the time of our investigation; review of previous reports relevant to the site conditions; and laboratory results from an outside analytical laboratory.

Changes in the information or data gained from any of these sources could result in changes in our conclusions or recommendations. If such changes do occur, we should be advised so that we can review our report in light of those changes.

****

REFERENCES

Alameda County Flood Control and Water Conservation District, June, 1988, "Geohydrology and Ground Water Quality Overview of the East Bay Plain Area, Alameda County, California", 205 (j) report prepared under contract to the California Regional Water Quality Control Board, San Francisco Bay Region.

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Hoexter Consulting, Inc, "Quarterly Ground Water Sampling Reports for 1970 Seminary Avenue, Oakland, California", dated February 24, 1992, May 29, 1992, and August 31, 1992.

....., "Proposed Subsurface Investigation (Work Plan), Former Grimit Auto and Repair, STID 553, 1970 Seminary Avenue, Oakland, California", December 17, 1993.

Kaldveer Associates, Inc. "Soil and Ground Water Testing Report, 1970 Seminary Avenue, Oakland, California", September 28, 1990.

NET / National Environmental Testing, Inc, "Project 0380", December 5, 1989.

..... "Grimit Auto, Oakland, Job 1319, June 5, 1991", analytical test results.

Petro Tech, "Underground Tank Removal, Invoice 0380", November 28, 1989.

....."Clean-up Effort Related to Waste Oil Excavation, Job 1319", letter dated May 21, 1991.

Radbruch, Dorothy H, 1969, "Aerial and Engineering Geology of the Oakland East Quadrangle, California", USGS GQ-769, Scale 1:24,000.

United States Geological Survey, Oakland East Quadrangle, 1959 photorevised 1968 and 1973, 7.5' Topographic Map Series, Scale 1:24,000.

TABLE 1

GROUND WATER ELEVATION DATA
(All Measurements in Feet)

Well Number	Well Top Elevation (2)	Depth to Water	Relative Ground Water Elevation (2)
MW-1			
8/6/90	37.0	21.5	15.5
1/28/92		21.0	16.0
4/27/92		20.95	16.05
8/10/92		22.20	14.8
2/11/94		15.93 (3)	21.07
2/28/94		13.85 (4)	23.15
MW-2			
2/11/94	36.40	14.16 (3)	22.24
2/28/94		16.01 (4)	20.39
MW-3			
2/11/94	36.94	6.97 (3)	29.97
2/28/94		7.74 (4)	29.20

Notes:

(1) N/A = Not Applicable
(2) City of Oakland datum
(3) Well under pressure when locking cap removed; water level may not have been stabilized
(4) Depth to water was measured over a 120 minute period; indicated depths are final, stabilized readings

TABLE 2

SUMMARY OF ANALYTICAL TEST RESULTS - SOIL

(Results reported in parts per million, mg/kg) (1)

Sample	TPH Gasoline	Benzene	Toluene	Xylenes	Ethyl-benzene	Oil and Grease
MW-2						
10.5-11.0	910	ND	0.76	6.1	4.2	38
16.0-16.5	ND	ND	0.022	ND	ND	ND
20.5-21.0						
25.5-26.0 (2)	ND	ND	ND	ND	ND	ND
MW-3						
10.5-11.0	ND	ND	0.020	ND	ND	ND
20.5-21.0	1.2	0.17	0.047	0.085	ND	ND

Notes:

(1) ND = non-detect
(2) Composite

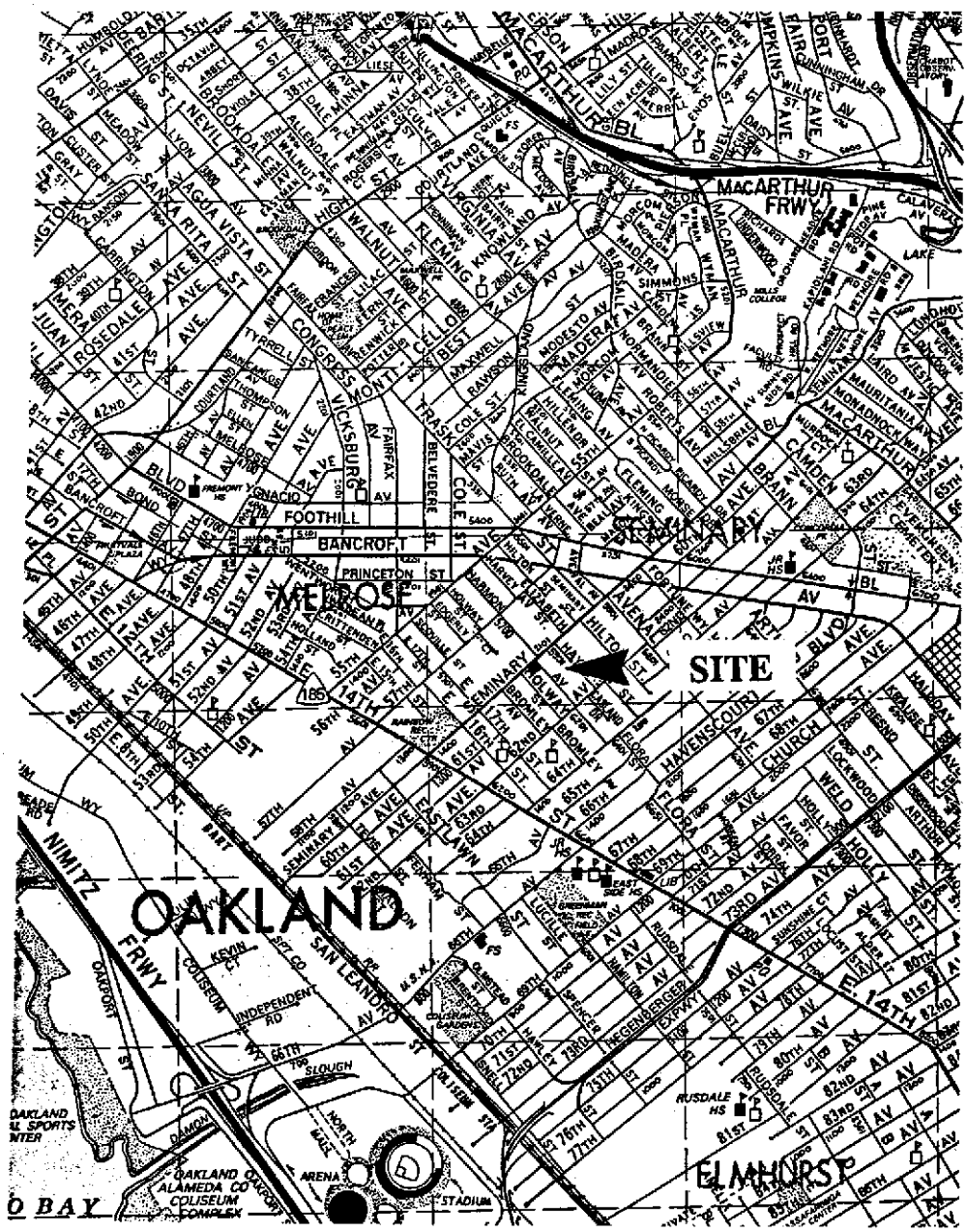
TABLE 3

SUMMARY OF ANALYTICAL TEST RESULTS - GROUND WATER
(Results reported in parts per million, mg/l) (1)

Well and Date	TPH Gasoline	Benzene	Toluene	Xylenes	Ethyl-benzene	Oil & Grease
MW-1						
8/6/90 (2)	54	3.5	3.2	9.4	1.9	7.6
1/28/92 (3)	2,000	7.4	17.0	120.0	28.0	75 (5)
4/27/92 (3)	500	3.4	6.4	45.0	10.0	440 (6)
4/27/92 (4)	175	4.2	4.4	14.6	3.2	N/A
8/10/92 (3)	170	4.2	4.2	15.0	3.3	120 (6)
2/11/94 (3)	1,800	ND	5.1	23.0	5.2	16
MW-2						
2/11/94 (3)	0.130	0.022	0.0011	0.0073	0.0052	ND
MW-3						
2/11/94 (3)	ND	ND	ND	ND	ND	ND
Irrigation Well						
2/11/94	ND	ND	ND	ND	ND	ND

Notes:

(1) ND - non-detect; N/A - not applicable
(2) Kaldveer Associates report, September, 1990
(3) Sequoia Analytical Laboratory
(4) Applied Remediation Laboratory
(5) Gravimetric Method
(6) Infrared Method



ALAMEDA COUNTY

1991 *Thomas Guide.*

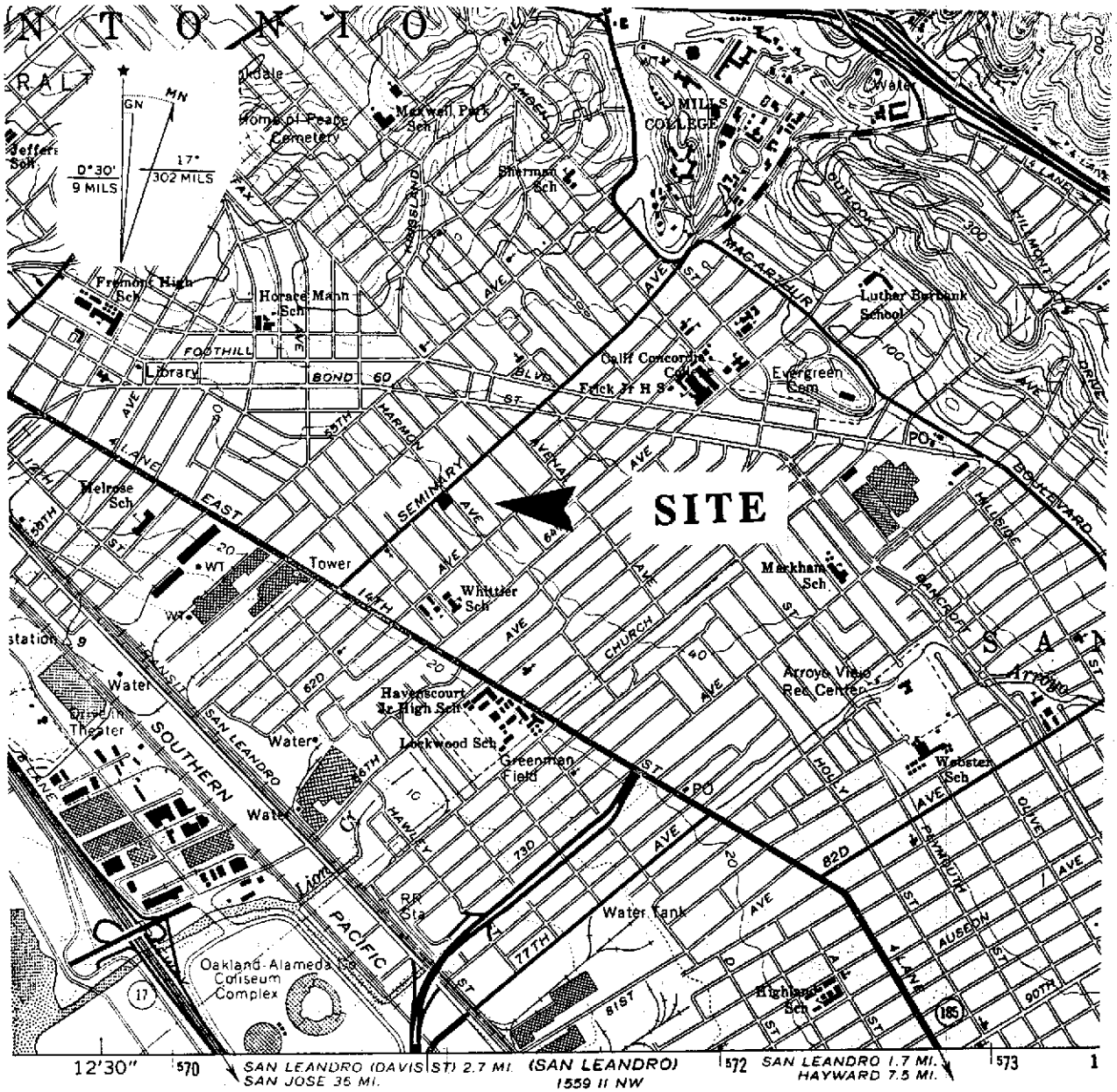
0 ¼ ½ ¾ 1 MILES
0 1 2 5 1 KILOMETERS

HOEXTER CONSULTING
Geology
Engineering Geology
Environmental Studies

LOCATION MAP

1970 Seminary Avenue
Oakland, California

Project No.	Date	Figure
E-10-1-019	March, 1994	1



Base: Oakland East 7.5" Quad, 1959 photorev. 1968, 1973, USGS

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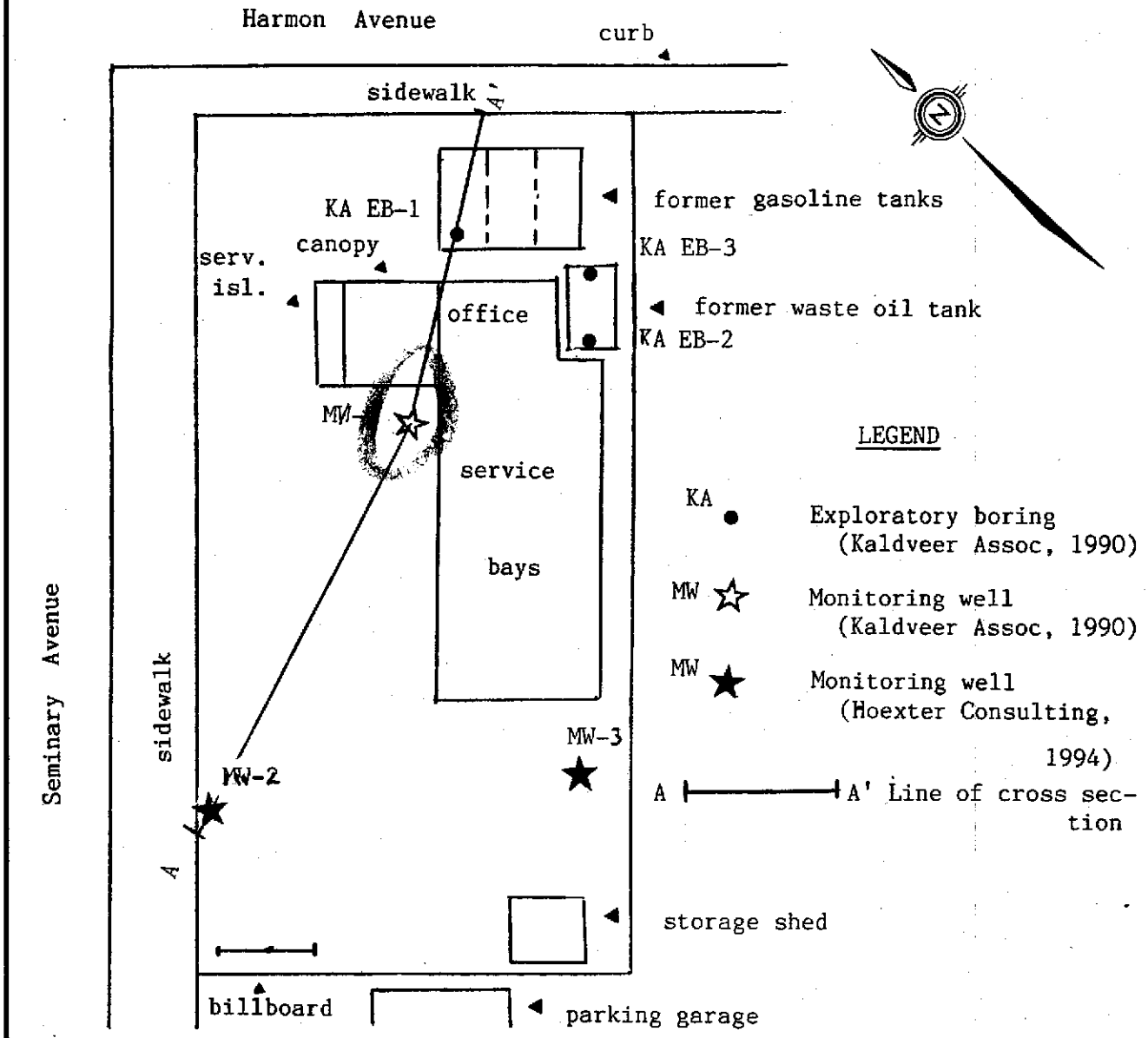
Engineering Geology
Environmental Studies

TOPOGRAPHIC MAP

1970 Seminary Avenue
Oakland, California

Project No.	Date	Figure 2
E-10-1-019	March, 1994	



Base: Field sketch, 10/25/93

HOEXTER CONSULTING
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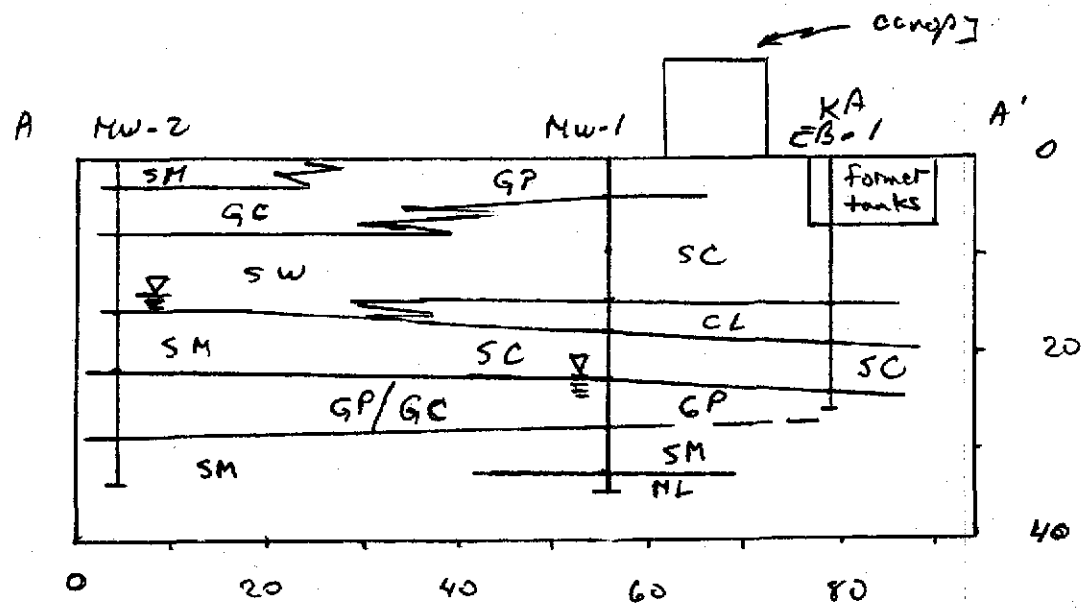
Engineering Geology
Environmental Studies

SITE PLAN

1970 Seminary Avenue
Oakland, California

Project No.	Date	Figure 3
E-10-1-019	March, 1994	

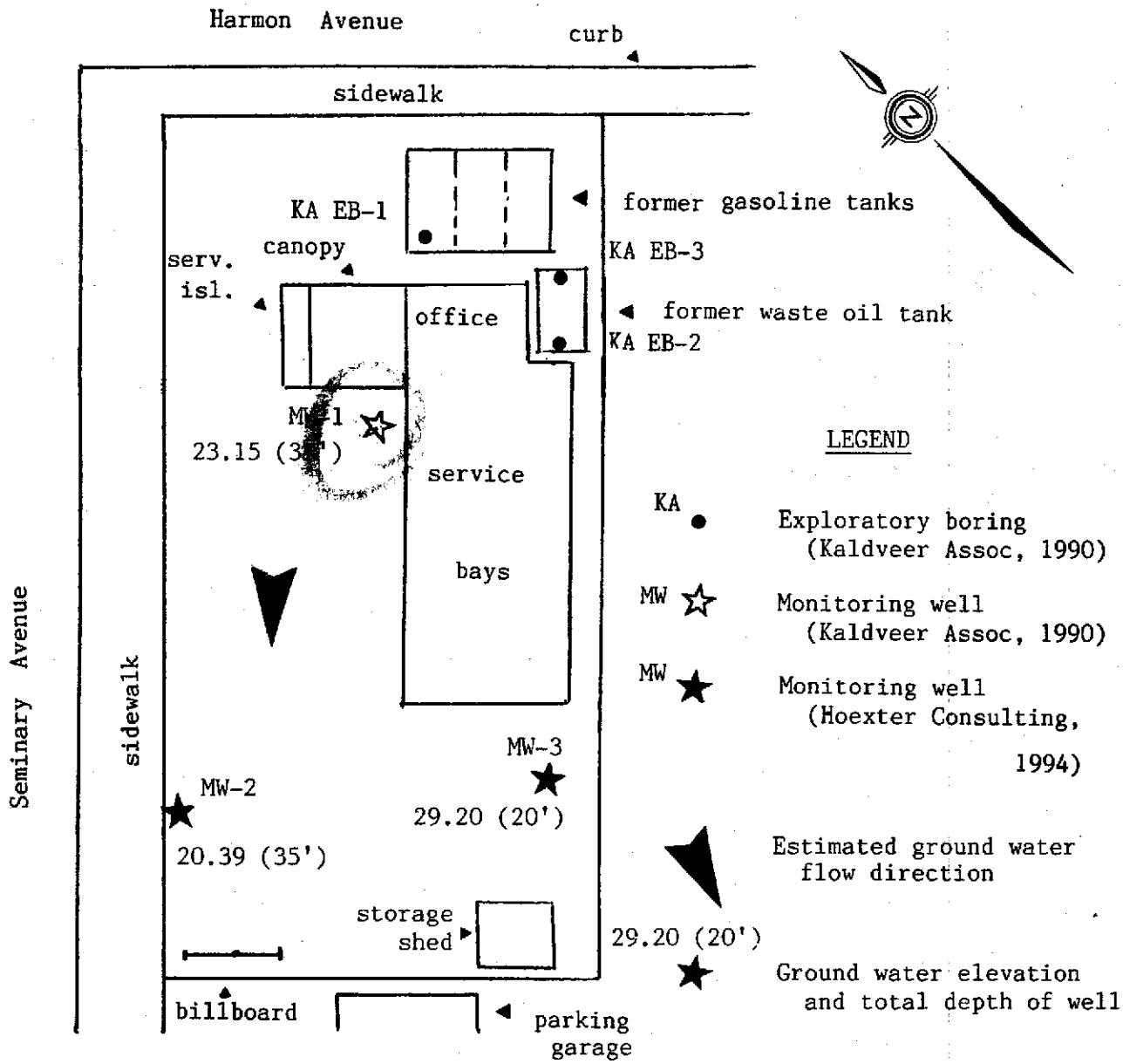


▽ Initial ground water

Vertical = horizontal scale

See figure 3 for location of section

HOEXTER CONSULTING **Geology** **Engineering Geology** **Environmental Studies**	CROSS SECTION A-A' 1970 Seminary Avenue Oakland, California	
	Project No. E-10-1-019	**Date** March, 1994
		Figure 4



Date of measurement: 2/28/94

Base: Field sketch, 10/25/93

20 0 20 40

APPROXIMATE SCALE IN FEET

HOEXTER CONSULTING
Geology
Engineering Geology
Environmental Studies

GROUND WATER DATA

1970 Seminary Avenue
Oakland, California

Project No.	Date	Figure 5
E-10-1-019	March, 1994	

APPENDIX A

MONITORING WELL PERMIT
EXPLORATORY BORING LOGS
AND EXPLANATION

ALAMEDA COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT
5997 PARKSIDE DRIVE • PLEASANTON, CALIFORNIA 94588 • (510) 484-2600

18 January 1994

Hoexter Consulting
734 Torreya Court
Palo Alto, CA 94303

Gentlemen:

Enclosed is drilling permit 94024 for a monitoring well construction project at 1970 Seminary Avenue in Oakland for Doyle Grimit.

Please note that permit condition A-2 requires that a well construction report be submitted after completion of the work. The report should include drilling and completion logs, location sketch and permit number.

If you have any questions, please contact Wyman Hong at extension 235 or me at extension 233.

Very truly yours,

Craig A. Mayfield

Craig A. Mayfield
Water Resources Engineer III

WH:mm
Enc.

ZONE 7 WATER AGENCY

5997 PARKSIDE DRIVE PLEASANTON, CALIFORNIA 94588 VOICE (510) 484-2600
FAX (510) 462-3914

RECEIVED
JAN 19 1994
ZONE 7, ACFC&WCD

DRILLING PERMIT APPLICATION

FOR APPLICANT TO COMPLETE

LOCATION OF PROJECT 1970 Seminary Ave
Oakland CA

CLIENT
Name Doyle Grimit
Address 14366 Lark St. Voice 510 357-5133
City San Leandro CA Zip 94578

APPLICANT
Name HOEXTER CONSULTING, INC
DAVID F. HOEXTER Fax 415-494-2505
Address 734 Torreya Ct. Voice 415-494-2505
City Palo Alto CA Zip 94303

TYPE OF PROJECT

Well Construction		Geotechnical Investigation	
Cathodic Protection	___	General	___
Water Supply	___	Contamination	___
Monitoring	X	Well Destruction	___

PROPOSED WATER SUPPLY WELL USE
Domestic ___ Industrial ___ Other ___
Municipal ___ Irrigation ___

DRILLING METHOD:
Mud Rotary ___ Air Rotary ___ Auger X
Cable ___ Other ___

DRILLER'S LICENSE NO. 265556 C-61, C-57

WELL PROJECTS

Drill Hole Diameter	6	in.	Maximum Depth	35	ft.
Casing Diameter	2	in.			
Surface Seal Depth	15	ft.	Number	2	

GEOTECHNICAL PROJECTS

Number of Borings	___		Maximum Depth	___	ft.
Hole Diameter	___	in.			

ESTIMATED STARTING DATE 1/24/94
ESTIMATED COMPLETION DATE 1/24/94

I hereby agree to comply with all requirements of this permit and Alameda County Ordinance No. 73-68. * please inform me if you require notification -

APPLICANT'S SIGNATURE [signature] Date 1/12/94
CA - CEG - 1158

FOR OFFICE USE

PERMIT NUMBER 94024
LOCATION NUMBER ___

PERMIT CONDITIONS

Circled Permit Requirements Apply

(A.) GENERAL
1. A permit application should be submitted so as to arrive at the Zone 7 office five days prior to proposed starting date.
2. Submit to Zone 7 within 60 days after completion of permitted work the original Department of Water Resources Water Well Drillers Report or equivalent for well Projects, or drilling logs and location sketch for geotechnical projects.
3. Permit is void if project not begun within 90 days of approval date.

(B.) WATER WELLS, INCLUDING PIEZOMETERS
1. Minimum surface seal thickness is two inches of cement grout placed by tremie.
2. Minimum seal depth is 50 feet for municipal and industrial wells or 20 feet for domestic and irrigation wells unless a lesser depth is specially approved. Minimum seal depth for monitoring wells is the maximum depth practicable or 20 feet.

C. GEOTECHNICAL. *Backfill bore hole with compacted cuttings or* heavy bentonite and upper two feet with compacted material. In areas of known or suspected contamination, tremied cement grout shall be used in place of compacted cuttings.

D. CATHODIC. Fill hole above anode zone with concrete placed by tremie.

E. WELL DESTRUCTION. See attached.

Approved Wyman Hong Date 14 Jan 94
Wyman Hong

91992

PROJECT: 1970 Seminary Avenue, Oakland, California | BORING NO: Explanation

DATE DRILLED/LOGGED BY

TYPE OF BORING/DIAMETER

SURFACE ELEVATION

HAMMER WEIGHT

DESCRIPTION OF MATERIALS:

SAMPLES

DEPTH IN FT. | SAMPLE | NUMBER - DIAMETER | BLOWS/FT. | PID - PPM | GROUND WATER LEVEL | OTHER TESTS | WELL COMPLETION

PID = Photoionizaton Detector

Driven sample interval (5.5-7.0'), indicating number of blows per last 12" of drive

14

Approximate depth of contact between soil/rock types

Ground water level

Explanation of well completion symbols:

- Slotted well casing
- Cement grout
- Sand
- Bentonite
- Native materials

5.0
7.0
8.0

End Plug

Total depth of boring = 25.0'

5 10 15 20 25 30

JOB NO: E-10-1-019

HOEXTER CONSULTING, INC.

FIGURE: A-0

PROJECT: 1970 Seminary Avenue, Oakland, California

BORING NO: MW-1 *

DATE DRILLED/ LOGGED BY 8/3/90/ * Kaldveer Assoc.

TYPE OF BORING/DIAMETER 8"HSA

SURFACE ELEVATION 37.00

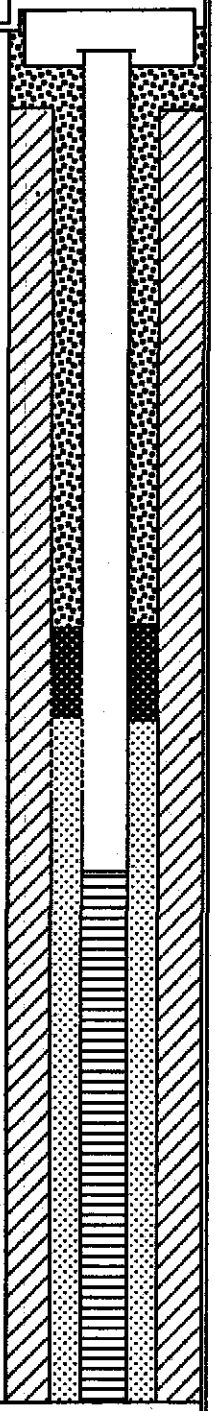
HAMMER WEIGHT 140 lb.

DESCRIPTION OF MATERIALS:

SAMPLES

DEPTH IN FT.	SAMPLE	NUMBER - DIAMETER	BLOWS/FT.	PID-PPM	GROUND WATER LEVEL	OTHER TESTS
Asphalt (2")						
GP: Sandy gravel, light brown, dry angular gravel to 1/2" diameter; fine to med. grained sand, large sandstone "cobbles"				No odor		
5						
SC: Sandy clay, light brown, dry, very stiff, "patches" of red, yellow, black, some fine to coarse angular gravel to 1/4" diam, med. to coarse grained sand, some asphalt (?) and chert fragments			31	No odor		
grades to damp						
10			52			
increasing gravel					▽ - sta-bilized 2/28/94	
15			30	No odor		
CL: silty clay, reddish brown, gray mottled, damp, very stiff, some coarse grained sand						
SM: clayey silty sand, light brown, black mottled, moist, stiff, fine-grained sand, some fine angular gravel						
20			16	No odor		
GP: sandy gravel, grayish-green with brown, saturated, dense, fine to coarse angular gravel to 1/4" diameter, fine to coarse sand, some clay binder						
25			56	Strong odor petrol. hydrocarb	▽ - initial	
SM: clayed silty sand, brown, moist to saturated, dense, fine-grained,						
30				No odor		

WELL COMPLETION



JOB NO: E-10-1-019

HOEXTER CONSULTING, INC.

FIGURE: A-1/1

PROJECT: 1970 Seminary Avenue, Oakland, California | BORING NO: MW-1cont.

DATE DRILLED/LOGGED BY

TYPE OF BORING/DIAMETER

SURFACE ELEVATION

HAMMER WEIGHT

DESCRIPTION OF MATERIALS:

SAMPLES

DEPTH IN FT.	SAMPLE	NUMBER - DIAMETER	BLOWS/FT.	PID - PPM	GROUND WATER LEVEL	OTHER TESTS	WELL COMPLETION
			46				
				No odor			
35			18				

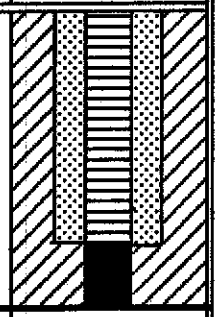
water transmission along fractures

ML: sandy clayey silt, brown, damp, stiff, sand fine-grained

TD=35.0 drilled, 36.5 sampled

Well completed with 2" diameter 0.020 slot casing, schedule 40, 1/12 washed sand filter pack, bentonite pellet seal, and cement grout surface seal

*** Well installed by Kaldveer Associates**



JOB NO: E-10-1-019

HOEXTER CONSULTING, INC.

FIGURE: A-1/2

PROJECT: 1970 Seminary Avenue, Oakland, California | **BORING NO:** MW-2

DATE DRILLED/LOGGED BY 1/28/94/DFH

TYPE OF BORING/DIAMETER 8"HSA

SURFACE ELEVATION 36.40

HAMMER WEIGHT 140 lb.

DESCRIPTION OF MATERIALS:

SAMPLES

DEPTH IN FT.	SAMPLE	NUMBER - DIAMETER	BLOWS/FT.	PID - PPM	GROUND WATER LEVEL	OTHER TESTS
5			26	ND		No odor
10			28	85/60		Odor
15			19	3/5	initial and sta-bilized 2/28/94	No odor
20			11	9/7		No odor
25			25	ND/8		No odor
30						

Asphalt (2")

SM: gravelly silty fine sand, brown, med. dense, moist

SM: silty fine sand, light brown, moist

GC: clayey gravel, yellow-brown, med. dense, slightly moist

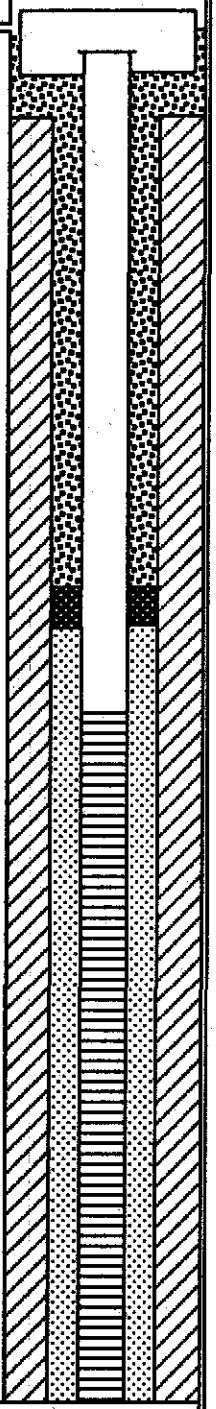
SW: clayey gravelly sand, olive-green-brown, moist, med. dense

driller reports small amount water

SM: silty fine sand, light green-brown, loose to med. dense, very moist, Mn. stains

gravel interbeds 23-30' (based on drilling)

WELL COMPLETION



JOB NO: E-10-1-019

HOEXTER CONSULTING, INC.

FIGURE: A-2/1

PROJECT: 1970 Seminary Avenue, Oakland, California | **BORING NO:** MW-2 cont.

DATE DRILLED/LOGGED BY

TYPE OF BORING/DIAMETER

SURFACE ELEVATION

HAMMER WEIGHT

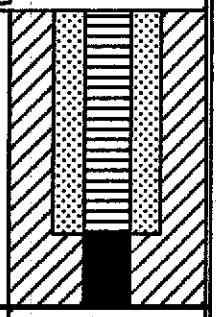
DESCRIPTION OF MATERIALS:

SAMPLES

DEPTH IN FT.	SAMPLE	NUMBER - DIAMETER	BLOWS/FT.	PID - PPM	GROUND WATER LEVEL	OTHER TESTS	WELL COMPLETION
			56	90/10		slight odor	
No water at completion	35		28	60/5		no odor	

TD=35.0 drilled, 36.5 sampled

Completed well with 2" diameter 0.020 slot casing; RMC Lonestar 2/12 washed Monterey lapis lustre sand; bentonite pellet seal; and RMC Lonestar Type I-II Portland Cement



JOB NO: E-10-1-019

HOEXTER CONSULTING, INC.

FIGURE: A-2/2

PROJECT: 1970 Seminary Avenue, Oakland, California | **BORING NO:** MW-3

DATE DRILLED/LOGGED BY 1/28/94/DFH

TYPE OF BORING/DIAMETER 8"HSA

SURFACE ELEVATION 36.94

HAMMER WEIGHT 140 lb.

DESCRIPTION OF MATERIALS:

SAMPLES

DEPTH IN FT.	SAMPLE	NUMBER - DIAMETER	BLOWS/FT.	PID-PPM	GROUND WATER LEVEL	OTHER TESTS	WELL COMPLETION
Asphalt (2")							
SM: gravelly silty fine sand, dark brown, moist							
grades light brown							
GW: silty sandy gravel, light brown, slightly moist							
5			25	ND		odor	
				40/30		sl. odor	
CL: Gravelly sandy clay, brown, blue-gray on fractures and "pin-holes", very stiff, moist					stabilized 2/28/94		
10			24	28/8			
CL: gravelly silty clay, brown, moist, very stiff							
15			19	3/4	initial	No odor	
Pulled back augers: water in boring; hydrocarbon odor; decided to complete well to 20'							
20			10	30/20		Sl. odor	
TD=20.0' drilled, 21.5' sampled							
Completed well with 2" diameter 0.020 slot casing; RMC Lonestar 2/12 washed Monterey lapis lustre sand; bentonite pellet seal; and RMC Lonestar Type I-II Portland Cement							
25							
30							

JOB NO: E-10-1-019

HOEXTER CONSULTING, INC.

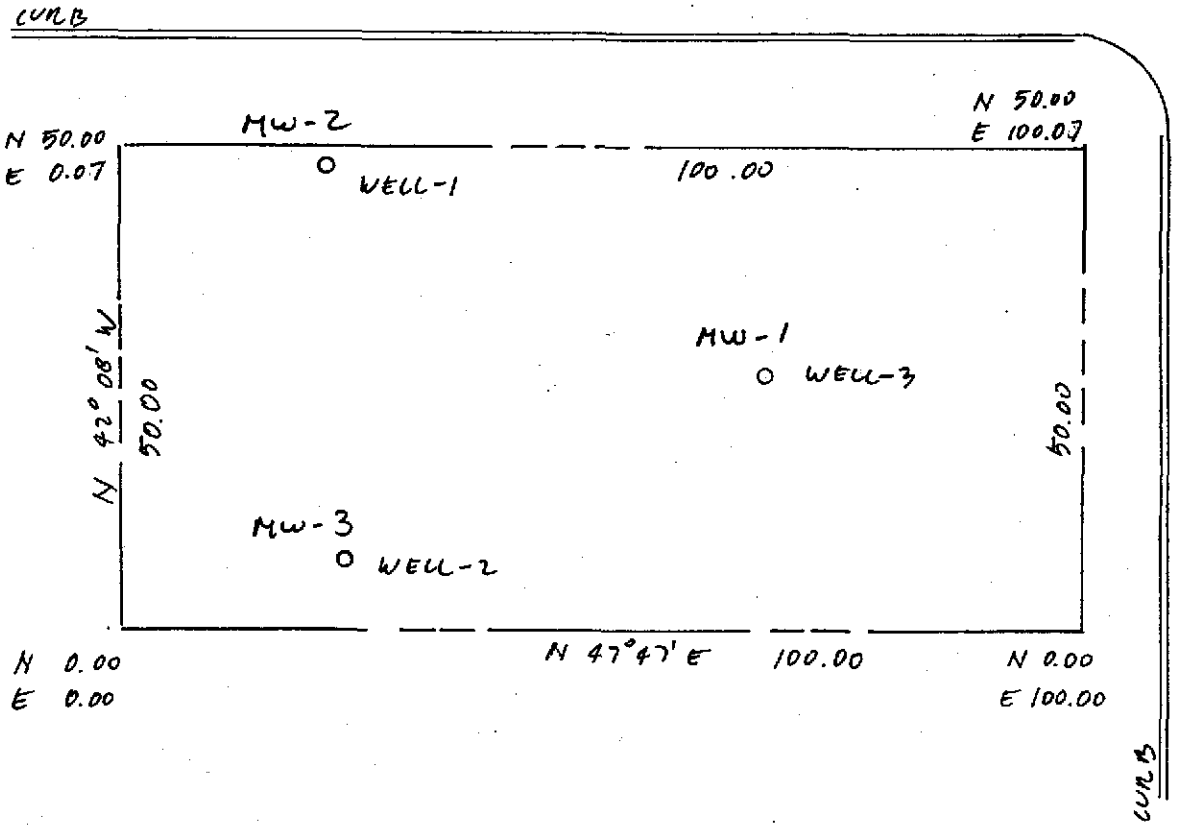
FIGURE: A-3

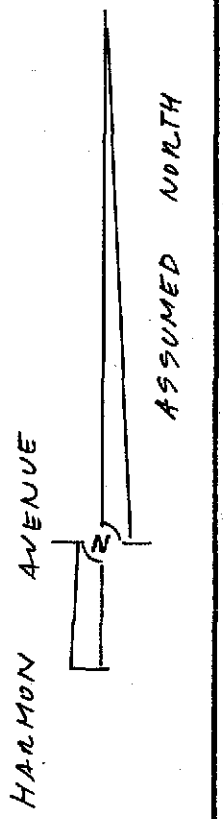
APPENDIX B

WELL ELEVATION SITE SURVEY

E-10-1-019

SEMINARY AVENUE





WELL NO	N	E	RIM EL.	P.V.C. PIPE EL.
1	48.75	21.25	36.703	36.402
2	7.26	22.82	37.296	36.940
3	26.69	66.31	37.312	36.996

* MW designation / DFH 3/21/94

LICENSED LAND SURVEYOR
ANDREAS P. DEAK
NO. 4739
STATE OF CALIFORNIA

ELEVATIONS ON MONITORING WELLS AT HIGHEST POINT.

DATE FEB 11 1999
SCALE 1" = 20'
SURVEY DEAK
PLAT DEAK
APN 38-3211-1-4
JOB NO.

CLIENT: HOEXTER CONSULTING

ANDREAS DEAK
LICENSED LAND SURVEYOR
2116 BUENA VISTA AVENUE ALAMEDA CA 94501
PHONE: 865-4289

APPENDIX C

CHAINS OF CUSTODY AND ANALYTICAL TEST RESULTS - SOIL

CHAIN-OF-CUSTODY RECORD

Project Number	Project Name
E-10-1-019	1970 Seminary

Sampler's Name (printed): DAVID F. HOEXTER

Boring Number	Date	Time	Soil	Water	Sample Location or Depth	Sample Number	Number/Type of Containers	Analytical Tests: TPH-G/BTEX	Analytical Tests: TPH-D & M 5520 C&F	Remarks
MW-2	1/28/94		X		10.5' - 11.0'		1-2"ss	X	X	9401977 -01
"	↓		↓		16.0' - 16.5'		↓	X	X	-02
EB-4/MW-3					10.5 - 11.0			X	X	EB-4 converted to MW-3 -03
"					20.5 - 21.0			X	X	-04
MW-2					20.5 - 21.0			X	X	composite -05
"					25.5 - 26.0			X	X	composite

Relinquished by: (Signature)	Date/Time	Received by: (Signature)
[signature]	1/31/94 10:40	
Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Relinquished by: (Signature)	Date/Time	Received for Laboratory by: (Signature)
		[signature] 10:45 1/31/94

Ship To: Sequoia Analytical
680 Chesapeake Dr
Redwood City CA 94063

Attention: Peggy Penner / Receiving
Phone No: 415-364-9600

Requested Turnaround Time: Normal - 10dy

Contact: DAVID F. HOEXTER

Phone: 415-494-2505 (Phone/FAX)

Remarks: + oil & grease / total recoverable oil by IR

Hoexter Consulting
Engineering Geology
734 Torreya Court
Palo Alto, CA 94303

SEQUOIA ANALYTICAL

680 Chesapeake Drive • Redwood City, CA 94063
(415) 364-9600 • FAX (415) 364-9233

Hoexter Consulting Engr Geology	Client Project ID:	E-10-1-019, 1970 Seminary	Sampled:	Jan 28, 1994
734 Torreya Court	Sample Matrix:	Soil	Received:	Jan 31, 1994
Palo Alto, CA 94303	Analysis Method:	EPA 5030/8015 Mod./8020	Reported:	Feb 14, 1994
Attention: David F. Hoexter	First Sample #:	4AG7701		

TOTAL PURGEABLE PETROLEUM HYDROCARBONS with BTEX DISTINCTION

Analyte	Reporting Limit mg/kg	Sample I.D. 4AG7701 MW-2 10.5-11'	Sample I.D. 4AG7702 MW-2 16-16.5'	Sample I.D. 4AG7703 MW-3 10.5-11'	Sample I.D. 4AG7704 MW-3 20.5-21'	Sample I.D. 4AG7705 MW-2 20.5-21' MW-2 25.5-26'
Purgeable Hydrocarbons	1.0	910	N.D.	N.D.	1.2	N.D.
Benzene	0.0050	N.D.	N.D.	N.D.	0.17	N.D.
Toluene	0.0050	0.76	0.022	0.020	0.047	N.D.
Ethyl Benzene	0.0050	4.2	N.D.	N.D.	N.D.	N.D.
Total Xylenes	0.0050	6.1	N.D.	N.D.	0.085	N.D.
Chromatogram Pattern:		Gas	--	--	Gas	--

Quality Control Data

Report Limit Multiplication Factor:	25	1.0	1.0	1.0	1.0
Date Analyzed:	2/4/94	2/4/94	2/4/94	2/4/94	2/4/94
Instrument Identification:	GCHP-18	GCHP-18	GCHP-18	GCHP-18	GCHP-18
Surrogate Recovery, %: (QC Limits = 70-130%)	285	75	78	118	114

Purgeable Hydrocarbons are quantitated against a fresh gasoline standard.
Analytes reported as N.D. were not detected above the stated reporting limit.

SEQUOIA ANALYTICAL

Peggy A. Penner
Project Manager

SEQUOIA ANALYTICAL

680 Chesapeake Drive • Redwood City, CA 94063
(415) 364-9600 • FAX (415) 364-9233

Hoexter Consulting Engr Geology	Client Project ID:	E-10-1-019, 1970 Seminary	Sampled:	Jan 28, 1994
734 Torreya Court	Matrix Descript:	Soil	Received:	Jan 31, 1994
Palo Alto, CA 94303	Analysis Method:	EPA 418.1 (I.R. with clean-up)		
Attention: David F. Hoexter	First Sample #:	4AG7701	Analyzed:	Feb 10, 1994
			Reported:	Feb 14, 1994

TOTAL RECOVERABLE PETROLEUM HYDROCARBONS

Sample Number	Sample Description	Petroleum Oil mg/kg (ppm)
4AG7701	MW-2 10.5-11'	38
4AG7702	MW-2 16-16.5'	N.D.
4AG7703	MW-3 10.5-11'	N.D.
4AG7704	MW-3 20.5-21'	N.D.
4AG7705	MW-2 20.5-21' MW-2 25.5-26.0'	N.D.

Detection Limits:	**15**

Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL

Peggy A. Penner
Project Manager

SEQUOIA ANALYTICAL
680 Chesapeake Drive • Redwood City, CA 94063
(415) 364-9600 • FAX (415) 364-9233

Hoexter Consulting Engr Geology	Client Project ID:	E-10-1-019, 1970 Seminary
734 Torreya Court	Matrix:	Soil
Palo Alto, CA 94303		
Attention: David F. Hoexter	QC Sample Group: 4AG7701-05	Reported: Feb 14, 1994

QUALITY CONTROL DATA REPORT

ANALYTE	Benzene	Toluene	Ethyl Benzene	Xylenes	Total Recov. Petroleum Hyd.
Method:	EPA 8020	EPA 8020	EPA 8020	EPA 8020	EPA 418.1
Analyst:	E. Cunanan	E. Cunanan	E. Cunanan	E. Cunanan	K. Hynes
MS/MSD Batch#:	4B07002	4B07002	4B07002	4B07002	4AG7501
Date Prepared:	2/4/94	2/4/94	2/4/94	2/4/94	2/10/94
Date Analyzed:	2/4/94	2/4/94	2/4/94	2/4/94	2/10/94
Instrument I.D.#:	GCHP-18	GCHP-18	GCHP-18	GCHP-18	N/A
Conc. Spiked:	0.20 mg/kg	0.20 mg/kg	0.20 mg/kg	0.60 mg/kg	230 mg/kg
Matrix Spike % Recovery:	90	95	100	102	87
Matrix Spike Duplicate % Recovery:	95	95	100	100	89
Relative % Difference:	5.4	0.0	0.0	2.0	2.3
LCS Batch#:	-	-	-	-	-
Date Prepared:	-	-	-	-	-
Date Analyzed:	-	-	-	-	-
Instrument I.D.#:	-	-	-	-	-
LCS % Recovery:	-	-	-	-	-
% Recovery Control Limits:	55-145	47-149	47-155	56-140	60-140

SEQUOIA ANALYTICAL

Peggy A. Penner
Project Manager

Please Note:
The LCS is a control sample of known, interferent free matrix that is analyzed using the same reagents, preparation, and analytical methods employed for the samples. The matrix spike is an aliquot of sample *fortified with known quantities of specific compounds and subjected* to the entire analytical procedure. If the recovery of analytes from the matrix spike does not fall within specified control limits due to matrix interference, the LCS recovery is to be used to validate the batch.

APPENDIX D

CHAINS OF CUSTODY, WELL SAMPLING DATA, AND ANALYTICAL TEST RESULTS - WATER

HOEXTER CONSULTING

Groundwater Sampling Field Log

Project Name/ No: Seminary / E-10-1-019
Client: D. Grimit
Project Manager: D. Hoexter
Sampler: D. Hoexter, J. Forsythe
Casing Diameter: 2 inch ____ 3 inch ____ 4 inch X 6 inch ____ Other: ____

Lab I.D.: ____
Date: 2/11/94
Sample Location/I.D.: Irrig. Well
Start Time: ____

Depth of Well (feet): ±80'
Depth to Water (feet): unknown / 20' assumed
Sample Depth (feet): ____

Calculated Purged Volume: 156 gal.
Actual Purged Volume 156±

60' wtr → 39.2 gal.

Field Measurements

Time	Cum	Volume (gal.)	pH (units)	E.C. (umhos/cm)	Temperature Degrees F	Color (visual)	Other
0914	39	39	7.39	798	58.7	clear	
0952	78	39	7.12	723	61.2		
0958	117	39	7.08	700	59.9		
1005	156	39	7.11	713	60.6		

Purge Method

____ 2" Bladder Pump ____ Bailer ____ Well Wizard X Dedicated
X Submersible Pump ____ Cenetrifugal Pump ____ Dipper ____ Other
____ Pneumatic Displacement Pump

Sample Method

____ 2" Bladder Pump ____ Bailer (Teflon) ____ Well Wizard X Dedicated
____ Surface Sampler ____ Dipper ____ Fultz Pump X Other sub. pump

Well Integrity: OK - active irrigation well for residence
Remarks: Sampled / purged well from continuous hose discharge. No water level

Signature: [signature]

Volumes Per Unit Length Selected Well Casing Diameters

Well Casing I.D. (inches)	Volume Per Unit Length Gal/ft	Cubic Ft/ft	L/M	L/Ft
1.5	0.0918	0.0123	1.140	0.3475
2.0	0.1632	0.0218	2.027	0.6178
3.0	0.3672	0.0491	4.560	1.3900
4.0	0.6528	0.0873	8.107	2.4710
6.0	1.4690	0.1963	18.240	5.5600

Conversion Factors

To Convert	Into	Mulitply
Ft. of Water	Lbs/sq.in.	0.4335
Lbs/Sq. inch	Ft. of Water	2.3070
Cubic feet	Gallons	7.4800
Gallons	Liters	3.7850
Feet	Meters	0.30048
Inches	Centimeters	2.5400

CHAIN-OF-CUSTODY RECORD

Project Number	Project Name
E-10-1-019	Seminary

Sampler's Name (printed): J. Forsythe, D. Hoexter

Boring Number	Date	Time	Soil	Water	Sample Location or Depth	Sample Number	Number/Type of Containers	Analytical Tests: TPH-G/BTEX	Remarks
									9402881
Irrigation	2/11/94	10:10		✓			3-40ml VOA	X	Bubble in bottle 1 - analyze 2 of 3 -01

Relinquished by: (Signature)	Date/Time	Received by: (Signature)
C. Forsythe	2/11/94 5:10	
Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Relinquished by: (Signature)	Date/Time	Received for Laboratory by: (Signature)
		2/11/94 17:10

Ship To: Sequoia Analytical
680 Chesapeake Dr.
Redwood City CA 94063
Attention: Peggy Poulos / receiving
Phone No: 415-364-9600

Requested Turnaround Time: Normal - 10 dy
Contact: DAVID F. HOEXTER
Phone: 415-494-2505 ph+fax
Remarks:

Hoexter Consulting
Engineering Geology
734 Torreya Court
Palo Alto, CA 94303

SEQUOIA ANALYTICAL

680 Chesapeake Drive • Redwood City, CA 94063
(415) 364-9600 • FAX (415) 364-9233

Hoexter Consulting Engrg Geol.	Client Project ID:	Seminary/E-10-1-019	Sampled:	Feb 11, 1994
734 Torreya Court	Sample Matrix:	Water	Received:	Feb 11, 1994
Palo Alto, CA 94303	Analysis Method:	EPA 5030/8015 Mod./8020	Reported:	Feb 25, 1994
Attention: David F. Hoexter	First Sample #:	4B88101		

TOTAL PURGEABLE PETROLEUM HYDROCARBONS with BTEX DISTINCTION

Analyte	Reporting *Limit* µg/L	Sample *I.D.* 4B88101 IRRIG WELL
Purgeable Hydrocarbons	50	N.D.
Benzene	0.50	N.D.
Toluene	0.50	N.D.
Ethyl Benzene	0.50	N.D.
Total Xylenes	0.50	N.D.
Chromatogram Pattern:		--

Quality Control Data

Report Limit Multiplication Factor:	1.0
Date Analyzed:	2/17/94
Instrument Identification:	GCHP-7
Surrogate Recovery, %: (QC Limits = 70-130%)	76

Purgeable Hydrocarbons are quantitated against a fresh gasoline standard.
Analytes reported as N.D. were not detected above the stated reporting limit.

SEQUOIA ANALYTICAL

Suzanne Chin
Project Manager

SEQUOIA ANALYTICAL

680 Chesapeake Drive • Redwood City, CA 94063
(415) 364-9600 • FAX (415) 364-9233

Hoexter Consulting Engrg Geol.
734 Torreya Court
Palo Alto, CA 94303
Attention: David F. Hoexter

Client Project ID: Seminary/E-10-1-019
Matrix: Water
QC Sample Group: 4B88101

Reported: Feb 25, 1994

QUALITY CONTROL DATA REPORT

ANALYTE	Benzene	Toluene	Ethyl Benzene	Xylenes
Method:	EPA 8020	EPA 8020	EPA 8020	EPA 8020
Analyst:	A. Maralit	A. Maralit	A. Maralit	A. Maralit
MS/MSD Batch#:	4B78404	4B78404	4B78404	4B78404
Date Prepared:	-	-	-	-
Date Analyzed:	2/17/94	2/17/94	2/17/94	2/17/94
Instrument I.D.#:	GCHP-7	GCHP-7	GCHP-7	GCHP-7
Conc. Spiked:	10 µg/L	10 µg/L	10 µg/L	30 µg/L
Matrix Spike % Recovery:	93	96	97	97
Matrix Spike Duplicate % Recovery:	95	99	98	97
Relative % Difference:	2.1	3.1	1.0	0.0
LCS Batch#:	-	-	-	-
Date Prepared:	-	-	-	-
Date Analyzed:	-	-	-	-
Instrument I.D.#:	-	-	-	-
LCS % Recovery:	-	-	-	-
% Recovery Control Limits:	71-133	72-128	72-130	71-120

Please Note:
The LCS is a control sample of known, interferent free matrix that is analyzed using the same reagents, preparation, and analytical methods employed for the samples. The matrix spike is an aliquot of sample fortified with known quantities of specific compounds and subjected to the entire analytical procedure. If the recovery of analytes from the matrix spike does not fall within specified control limits due to matrix interference, the LCS recovery is to be used to validate the batch.

SEQUOIA ANALYTICAL

Suzanne Chin
Project Manager

HOEXTER CONSULTING

Groundwater Sampling Field Log

Project Name/ No: 1970 Seminary / E-10-1 -019
Client: D. Grimit
Project Manager: D. F. Hoexter
Sampler: J. Forsythe
Casing Diameter: 2 inch X 3 inch ____ 4 inch ____ 6 inch ____ Other: ____

Lab I.D.: ____
Date: 2/11/94
Sample Location/I.D.: MW-1
Start Time: ____

Depth of Well (feet): 35
Depth to Water (feet): 15.93 / 18.80 ft. sample collection
Sample Depth (feet): ____

19.07' wtr → 3.11 gal/ft

Calculated Purged Volume: 12.8
Actual Purged Volume 12.8 ±

Field Measurements

Time	Cum	Volume (gal.)	pH (units)	E.C. (umhos/cm)	Temperature Degrees F	Color (visual)	Other
13:30	3.2	3.2 ±	6.95	1095	64.4	v. cloudy	
	6.4	3.2	6.84	1088	61.8		
	9.6	3.2	6.73	1085	60.7		
	12.8	3.2	6.76	1083	60.2		

Purge Method

____ 2" Bladder Pump X Bailer *(1) ____ Well Wizard ____ Dedicated
____ Submersible Pump ____ Cenetrifugal Pump ____ Dipper ____ Other
____ Pneumatic Displacement Pump

Sample Method

____ 2" Bladder Pump X Bailer (Teflon)(1) ____ Well Wizard ____ Dedicated
____ Surface Sampler ____ Dipper ____ Fultz Pump ____ Other

Well Integrity: OK
Remarks: Moderate odor, slight sheen, no floating product
(1) Dedicated disposable teflon

Signature: J. Forsythe / DTH

Volumes Per Unit Length Selected Well Casing Diameters

Well Casing I.D. (inches)	Volume Per Unit Length Gal/ft	Cubic Ft/ft	L/M	L/Ft
1.5	0.0918	0.0123	1.140	0.3475
2.0	0.1632	0.0218	2.027	0.6178
3.0	0.3672	0.0491	4.560	1.3900
4.0	0.6528	0.0873	8.107	2.4710
6.0	1.4690	0.1963	18.240	5.5600

Conversion Factors

To Convert	Into	Mulitply
Ft. of Water	Lbs/sq.in.	0.4335
Lbs/Sq. inch	Ft. of Water	2.3070
Cubic feet	Gallons	7.4800
Gallons	Liters	3.7850
Feet	Meters	0.30048
Inches	Centimeters	2.5400

HOEXTER CONSULTING

Groundwater Sampling Field Log

Project Name/ No: 1970 Seminary / E-04-019
Client: D. Grimit
Project Manager: D. Hoexter
Sampler: J. Forsythe
Casing Diameter: 2 inch X 3 inch ____ 4 inch ____ 6 inch ____ Other: ____

Lab I.D.: ____
Date: 2/11/94
Sample Location/I.D.: 176-2
Start Time: ____

Depth of Well (feet): 35
Depth to Water (feet): 14.16 / 26.67 depth to wtr. following sample collection
Sample Depth (feet): ____

Calculated Purged Volume: 14.2
Actual Purged Volume 14±

20.84' wtr → 3.4 gal/vol.

Field Measurements

Time	Cum	Volume (gal.)	pH (units)	E.C. (umhos/cm)	Temperature Degrees °F	Color (visual)	Other
1105	3.4	3.4±	7.05	1035	61.6	sl. cloudy	
	6.8	3.4	6.94	1094	63.1		
	10.8	3.4	6.87	1076	63.3		
	14.2	3.4	6.93	1085	63.0		

Purge Method

____ 2" Bladder Pump X Bailer - disp. teflon ____ Well Wizard ____ Dedicated
____ Submersible Pump ____ Cenetrifugal Pump ____ Dipper ____ Other
____ Pneumatic Displacement Pump

Sample Method

____ 2" Bladder Pump X Bailer (Teflon) ____ Well Wizard ____ Dedicated
____ Surface Sampler ____ Dipper ____ Fultz Pump ____ Other

Well Integrity: OK - wtr. level ref. high point on 2" PVC
Remarks: no odor, no sheen, no floating product

Signature: J. Forsythe /0714

Volumes Per Unit Length Selected Well Casing Diameters

Well Casing I.D. (inches)	Volume Per Unit Length Gal/ft	Cubic Ft/ft	L/M	L/Ft
1.5	0.0918	0.0123	1.140	0.3475
2.0	0.1632	0.0218	2.027	0.6178
3.0	0.3672	0.0491	4.560	1.3900
4.0	0.6528	0.0873	8.107	2.4710
6.0	1.4690	0.1963	18.240	5.5600

Conversion Factors

To Convert	Into	Mulitply
Ft. of Water	Lbs/sq.in.	0.4335
Lbs/Sq. inch	Ft. of Water	2.3070
Cubic feet	Gallons	7.4800
Gallons	Liters	3.7850
Feet	Meters	0.30048
Inches	Centimeters	2.5400

HOEXTER CONSULTING

Groundwater Sampling Field Log

Project Name/ No: E-10-1019, Seminary (#20)
Client: D. Grimit
Project Manager: D. Hoexter
Sampler: J. Forsythe
Casing Diameter: 2 inch X 3 inch ____ 4 inch ____ 6 inch ____ Other: ____

Lab I.D.: ____
Date: 2/11/94
Sample Location/I.D.: MW-3
Start Time: ____

Depth of Well (feet): 20
Depth to Water (feet): 6.97 / 17.32 ft. sample collection
Sample Depth (feet): ____

Calculated Purged Volume: ____
Actual Purged Volume ____

13.03' wtr → 2.13 gal/vol. **Field Measurements**

Time	Cum	Volume (gal.)	pH (units)	E.C. (umhos/cm)	Temperature Degrees C	Color (visual)	Other
1240	2.2	2.2±	7.04	1087	61.2	sl. cloudy	
	4.4	2.2	6.99	1102	64.5		
	6.6	2.2	7.09	1110	66.8		
	8.8	2.2	7.06	1112	65.2		

Purge Method

____ 2" Bladder Pump X Bailer - disp. tether ____ Well Wizard ____ Dedicated
____ Submersible Pump ____ Cenetrifugal Pump ____ Dipper ____ Other
____ Pneumatic Displacement Pump

Sample Method

____ 2" Bladder Pump X Bailer (Teflon) ____ Well Wizard ____ Dedicated
____ Surface Sampler ____ Dipper ____ Fultz Pump ____ Other

Well Integrity: OK
Remarks: No odor, no sheen, no floating product

Signature: J. Forsythe / DFH

Volumes Per Unit Length Selected Well Casing Diameters

Well Casing I.D. (inches)	Volume Per Unit Length Gal/ft	Cubic Ft/ft	L/M	L/Ft
1.5	0.0918	0.0123	1.140	0.3475
2.0	0.1632	0.0218	2.027	0.6178
3.0	0.3672	0.0491	4.560	1.3900
4.0	0.6528	0.0873	8.107	2.4710
6.0	1.4690	0.1963	18.240	5.5600

Conversion Factors

To Convert	Into	Multiply
Ft. of Water	Lbs/sq.in.	0.4335
Lbs/Sq. inch	Ft. of Water	2.3070
Cubic feet	Gallons	7.4800
Gallons	Liters	3.7850
Feet	Meters	0.30048
Inches	Centimeters	2.5400

CHAIN-OF-CUSTODY RECORD

Project Number	Project Name
E-10-1-019	Seminary

Sampler's Name (printed): J. Forsythe, D. Hoexter

Boring Number	Date	Time	Soil	Water	Sample Location or Depth	Sample Number	Number/Type of Containers	TPH-G	BTEX SM 5520 C/F						Remarks
MW-1	2/11/94	3:35		"			3-40ml	X							9402882-01
				"			1-1000ml		X						
MW-2	"	2:55		"			3-40ml	X							-02
				"			1-1000ml		X						
MW-3	"	3:15		"			3-40ml	X							-03
				"			1-1000ml		X						

Relinquished by: (Signature)	Date/Time	Received by: (Signature)
C. Forsythe	2/11/94 5:10	
Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Relinquished by: (Signature)	Date/Time	Received for Laboratory by: (Signature) 17 10 2/11/94

Ship To: Sequoia Analytical
686 Chesapeake Dr.
Redwood City CA 94063

Attention: Peggy Penner / Reviving
Phone No: 415-364-9600

Requested Turnaround Time: Normal - 10 dy

Contact: David F. Hoexter

Phone: 415-494-2505 ph/fax

Remarks: * oil & grease / total rec. petroleum oil by IR

Hoexter Consulting
Engineering Geology
734 Torreya Court
Palo Alto, CA 94303

SEQUOIA ANALYTICAL

680 Chesapeake Drive • Redwood City, CA 94063
(415) 364-9600 • FAX (415) 364-9233

Hoexter Consulting Engr. Geol.	Client Project ID:	Seminary/E-10-1-019	Sampled:	Feb 11, 1994
734 Torreya Court	Sample Matrix:	Water	Received:	Feb 11, 1994
Palo Alto, CA 94303	Analysis Method:	EPA 5030/8015 Mod./8020	Reported:	Feb 25, 1994
Attention: David F. Hoexter	First Sample #:	4B88201		

TOTAL PURGEABLE PETROLEUM HYDROCARBONS with BTEX DISTINCTION

Analyte	Reporting Limit µg/L	Sample I.D. 4B88201 MW-1	Sample I.D. 4B88202 MW-2	Sample I.D. 4B88203 MW-3
Purgeable Hydrocarbons	50	1,800,000	130	N.D.
Benzene	0.50	N.D.	22	N.D.
Toluene	0.50	5,100	1.1	N.D.
Ethyl Benzene	0.50	5,200	5.2	N.D.
Total Xylenes	0.50	23,000	7.3	N.D.
Chromatogram Pattern:		Weathered Gas	Gas	--

Quality Control Data

Report Limit Multiplication Factor:	10,000	1.0	1.0
Date Analyzed:	2/18/94	2/18/94	2/16/94
Instrument Identification:	GCHP-6	GCHP-6	GCHP-18
Surrogate Recovery, %: (QC Limits = 70-130%)	90	95	110

Purgeable Hydrocarbons are quantitated against a fresh gasoline standard.
Analytes reported as N.D. were not detected above the stated reporting limit.

SEQUOIA ANALYTICAL

Suzanne Chin
Project Manager

SEQUOIA ANALYTICAL

680 Chesapeake Drive • Redwood City, CA 94063
(415) 364-9600 • FAX (415) 364-9233

Hoexter Consulting Engr. Geol.	Client Project ID:	Seminary/E-10-1-019	Sampled:	Feb 11, 1994
734 Torreya Court	Matrix Descript:	Water	Received:	Feb 11, 1994
Palo Alto, CA 94303	Analysis Method:	EPA 418.1 (I.R. with clean-up)		
Attention: David F. Hoexter	First Sample #:	4B88201	Analyzed:	Feb 23, 1994
			Reported:	Feb 25, 1994

TOTAL RECOVERABLE PETROLEUM HYDROCARBONS

Sample Number	Sample Description	Detection Limit mg/L (ppm)	Petroleum Oil mg/L (ppm)
4B88201	MW-1	10	16
4B88202	MW-2	5.0	N.D.
4B88203	MW-3	10	N.D.

Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL

Suzanne Chin
Project Manager

SEQUOIA ANALYTICAL

680 Chesapeake Drive • Redwood City, CA 94063
(415) 364-9600 • FAX (415) 364-9233

Hoexter Consulting Engr. Geol.	Client Project ID:	Seminary/E-10-1-019
734 Torreya Court	Matrix:	Water
Palo Alto, CA 94303		
Attention: David F. Hoexter	QC Sample Group: 4B88201-02	Reported: Feb 25, 1994

QUALITY CONTROL DATA REPORT

ANALYTE	Benzene	Toluene	Ethyl Benzene	Xylenes
Method:	EPA 8020	EPA 8020	EPA 8020	EPA 8020
Analyst:	A. Maralit	A. Maralit	A. Maralit	A. Maralit
MS/MSD Batch#:	4B95511	4B95511	4B95511	4B95511
Date Prepared:	-	-	-	-
Date Analyzed:	2/18/94	2/18/94	2/18/94	2/18/94
Instrument I.D.#:	GCHP-6	GCHP-6	GCHP-6	GCHP-6
Conc. Spiked:	10 µg/L	10 µg/L	10 µg/L	30 µg/L
Matrix Spike % Recovery:	94	98	99	97
Matrix Spike Duplicate % Recovery:	83	88	90	87
Relative % Difference:	12	11	9.5	11
LCS Batch#:	-	-	-	-
Date Prepared:	-	-	-	-
Date Analyzed:	-	-	-	-
Instrument I.D.#:	-	-	-	-
LCS % Recovery:	-	-	-	-
% Recovery Control Limits:	71-133	72-128	72-130	71-120

Please Note:
The LCS is a control sample of known, interferent free matrix that is analyzed using the same reagents, preparation, and analytical methods employed for the samples. The matrix spike is an aliquot of sample fortified with known quantities of specific compounds and subjected to the entire analytical procedure. If the recovery of analytes from the matrix spike does not fall within specified control limits due to matrix interference, the LCS recovery is to be used to validate the batch.

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Hoexter Consulting Engr. Geol.	Client Project ID:	Seminary/E-10-1-019	
734 Torreya Court	Matrix:	Water	
Palo Alto, CA 94303			
Attention: David F. Hoexter	QC Sample Group: 4B88203		Reported: Feb 25, 1994

QUALITY CONTROL DATA REPORT

ANALYTE	Benzene	Toluene	Ethyl Benzene	Xylenes
Method:	EPA 8020	EPA 8020	EPA 8020	EPA 8020
Analyst:	R. Geckler	R. Geckler	R. Geckler	R. Geckler
MS/MSD Batch#:	4B83001	4B83001	4B83001	4B83001
Date Prepared:	-	-	-	-
Date Analyzed:	2/16/94	2/16/94	2/16/94	2/16/94
Instrument I.D.#:	GCHP-18	GCHP-18	GCHP-18	GCHP-18
Conc. Spiked:	10 µg/L	10 µg/L	10 µg/L	30 µg/L
Matrix Spike % Recovery:	97	78	98	97
Matrix Spike Duplicate % Recovery:	110	100	100	103
Relative % Difference:	13	25	2.0	6.0
LCS Batch#:	-	-	-	-
Date Prepared:	-	-	-	-
Date Analyzed:	-	-	-	-
Instrument I.D.#:	-	-	-	-
LCS % Recovery:	-	-	-	-
% Recovery Control Limits:	71-133	72-128	72-130	71-120

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Hoexter Consulting Engr. Geol.	Client Project ID:	Seminary/E-10-1-019
734 Torreya Court	Matrix:	Liquid
Palo Alto, CA 94303		
Attention: David F. Hoexter	QC Sample Group: 4B88201-03	Reported: Feb 25, 1994

QUALITY CONTROL DATA REPORT

ANALYTE	Total Recoverable Petroleum Hydrocarb.
Method:	EPA 418.1
Analyst:	K. Hynes

MS/MSD Batch#:	Blank
Date Prepared:	2/23/94
Date Analyzed:	2/23/94
Instrument I.D.#:	N/A
Conc. Spiked:	7.2 mg/L
Matrix Spike % Recovery:	84
Matrix Spike Duplicate % Recovery:	84
Relative % Difference:	0.0

LCS Batch#:	-
Date Prepared:	-
Date Analyzed:	-
Instrument I.D.#:	-
LCS % Recovery:	-

% Recovery Control Limits:	60-140

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