Atlantic Richfield Company
(a BP affiliated company)

P.O. Box 1257
San Ramon, CA 94583
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3 February 2009

Re: Monitoring Well Installation and Dual-Phase Extraction Pilot Testing Work Plan
Former BP Station # 11109
4280 Foothill Boulevard
Oakland, California
ACEH Case #RO0000426

"I declare, that to the best of my knowledge at the present time, that the information and/or recommendations contained in the attached document are true and correct."

Submitted by:

Paul Supple
Environmental Business Manger

Monitoring Well Installation and
Dual-Phase Extraction Pilot Testing Work Plan
Former BP Station No. 11109
4280 Foothill Boulevard, Oakland, California
ACEH Case No. RO0000426

Prepared for

Mr. Paul Supple
Environmental Business Manager
Atlantic Richfield Company
P.O. Box 1257
San Ramon, California 94583

Prepared by

BROADBENT & ASSOCIATES, INC.
ENGINEERING, WATER RESOURCES & ENVIRONMENTAL

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3 February 2009

Project No. 06-88-646

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BROADBENT & ASSOCIATES, INC
ENVIRONMENTAL. WATER RESOURCES & ENGINEERING

3 February 2009

Project No. 06-88-646

Atlantic Richfield Company
P.O. Box 1257
San Ramon, CA 94583
Submitted via ENFOS

Attn.: Mr. Paul Supple

Re: Monitoring Well Installation and Dual-Phase Extraction Pilot Testing Work Plan at Former BP Service Station #11109, 4280 Foothill Boulevard, Oakland, California (ACEH Case #RO0000426)

Dear Mr. Supple:

Broadbent & Associates, Inc. (BAI) is pleased to present this Monitoring Well Installation and Dual-Phase Extraction Pilot Testing Work Plan for the Former BP Station No. 11109, located at 4280 Foothill Boulevard, Oakland, California (Site). BAI prepared this work plan in response to the 5 December 2008 letter request from Mr. Paresh Khatri of Alameda County Environmental Health Services (ACEH). This work plan includes the proposed scope of work for monitoring well installation and dual-phase extraction pilot testing with a proposed completion schedule.

Should you have questions or require additional information, please do not hesitate to contact us at (530) 566-1400.

Sincerely,
BROADBENT & ASSOCIATES, INC.

Thomas A. Venus, P.E.
Senior Engineer

Robert H. Miller, P.G., C.HG.
Principal Hydrogeologist

PROFESSIONAL GEOLOGIST
ROBERT H. MILLER
No. 561
CERTIFIED HYDROGEOLOGIST
EXP. 4-30-10
STATE OF CALIFORNIA

Enclosures

cc: Mr. Paresh Khatri, Alameda County Environmental Health (Submitted via ACEH ftp site)
Ms. Shelby Lathrop, Conoco Phillips, 76 Broadway, Sacramento, CA 95818
Electronic copy uploaded to GeoTracker

MONITORING WELL INSTALLATION AND
DUAL-PHASE EXTRACTION PILOT TESTING WORK PLAN
Former BP Station No. 11109
4280 Foothill Boulevard, Oakland, California
ACEH Fuel Leak Case No. RO000426

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DUAL-PHASE EXTRACTION PILOT TESTING WORK PLAN
Former BP Station No. 11109
4280 Foothill Boulevard, Oakland, California
ACEH Fuel Leak Case No. RO000426

1.0 INTRODUCTION

Broadbent & Associates, Inc. (BAI) has prepared this *Monitoring Well Installation and Dual-Phase Extraction Pilot Testing Work Plan* for the Former BP Station No. 11109, located at 4280 Foothill Boulevard, Oakland, California (Site). This work plan was prepared in partial response to the 5 December 2008 directive letter request from Mr. Paresh Khatri of Alameda County Environmental Health Services (ACEH). In addition to requesting a work plan for soil and ground-water characterization and vapor phase or dual-phase extraction (DPE) pilot testing, the directive letter also requested the preparation of a preferential pathway study for incorporation within the work plan. As ACEH is aware by our release signature request, BAI has sought from the California Department of Water Resources (DWR) copies of nearby confidential well records. The requested well records have not been received from the DWR yet. BAI has received offsite subsurface water and sanitary sewer plans from the East Bay Municipal Utility District. However, BAI has not received subsurface gas and electric plans from Pacific Gas & Electric Company, nor storm drain plans from the City of Oakland. BAI shall endeavor to acquire this data in time to incorporate them into the Soil & Water Investigation with DPE Feasibility Study Report which will result from implementation of this work plan. A copy of this directive letter is provided within Appendix A. This work plan has also been prepared for the benefit of Stratus Environmental, Inc. (Stratus), who will be performing the scope of work provided herein, under the direction of BAI and BP.

This work plan includes the proposed scope of work for monitoring well installation and dual-phase extraction pilot testing and a completion schedule. Monitoring well installation is to be performed in the area of well MW-5 in the southern corner of the property. MW-5 is located in an area containing elevated hydrocarbon concentrations, but the top of the screen interval is often submerged. The monitoring/recovery wells proposed to be installed will be appropriately screened across the water table. Finally, pilot testing activities are to be performed to assist with evaluation of DPE as a potentially viable remediation technology to address soil and ground-water contamination at the Site.

2.0 SITE BACKGROUND

The Site is currently an operating service station located on the north corner of Foothill Boulevard and High Street in a mixed commercial and residential area of Oakland, California. The Site features include a station building containing three service bays (converted into a convenience store) and four pump islands with a canopy and concrete drive slab. Existing underground storage tanks (USTs) include three double-wall fiberglass gasoline tanks (10,000 gallons each) and one double-wall fiberglass waste oil tank (1,000 gallon). The three 10,000-gallon USTs store regular, plus, and super unleaded gasoline and were reportedly installed in 1991. The waste oil tank was reportedly installed in 1989 or 1990 (EMCON, 12/27/1994). The Site was operated by Mobil Oil Corporation (Mobil) as Mobil Service Station No.10-H69 since at least the early 1970's. BP acquired the station from Mobil on 1 May 1989 (BP 1990) and operated the station under the BP brand. BP sold the station in 1994 to Tosco, which was

acquired by ConocoPhillips who operated a 76-branded station for some time. Currently, the station operates under an independent brand. The ACEH-assigned Fuel Leak Case number for the Site is RO0000426 / GeoTracker Global ID No. T0600100217.

A church borders the Site to the northeast. Single-family residences border the Site to the northwest. The paved recreation courts and playing field of Fremont High School are located across High Street to the southeast. A Chevron-branded gasoline service station is located across Foothill Boulevard (4265 Foothill Boulevard) to the southwest of the Site. Chevron Gasoline Station No. 9-0076 is an active leaking UST case (ACEH Fuel Leak Case No. RO0000427 / GeoTracker Global ID No. T0600100339). A former Shell-branded gasoline service station was previously located at 4411 Foothill Boulevard across Foothill Boulevard and High Street to the south of the Site. This former Shell station is an active leaking UST case also (ACEH Fuel Leak Case No. RO0000415 / GeoTracker Global ID No. T0600101065). This southern corner of the intersection of Foothill Boulevard and High Street is presently developed into a small strip mall with shops and restaurants. The reader is referred to the recently submitted *Initial Site Conceptual Model* (BAI, 11/7/2008) for a summary of past environmental investigations and remediation activities conducted at the Site.

3.0 GEOLOGY

3.2 Regional Geology

According to the *East Bay Plain Groundwater Basin Beneficial Use Evaluation Report* (California Regional Water Quality Control Board – San Francisco Bay Region/SFRWQCB, June 1999), the Site is located within the Oakland Sub-Area of the East Bay Plain of the San Francisco Basin. The Oakland Sub-Area contains a sequence of alluvial fans. The alluvial fill thickness ranges from 300 to 700 feet deep. There are no well-defined aquitards such as estuarine mud. The largest and deepest wells in this sub-area historically pumped one to two million gallons per day at depths greater than 200 feet. Overall, sustainable yields are low due in part to low recharge potential. The Merritt sand in West Oakland was an important part of the early water supply for the City of Oakland. It is shallow (up to 60 feet), but before the turn of the last century, septic systems contaminated the water supply wells.

Throughout most of the Alameda County portion of the East Bay Plain, from Hayward north to Albany, water level contours show that the general direction of ground-water flow is from east to west or from the Hayward Fault to the San Francisco Bay. Ground-water flow direction generally correlates to topography. Flow direction and velocity are also influenced by buried stream channels that typically are oriented in an east to west direction. In the southern end of the study area however, near the San Lorenzo Sub-Area, the direction of flow may not be this simple. According to information presented in *East Bay Plain Groundwater Basin Beneficial Use Evaluation Report*, the small set of water level measurements available seemed to show that the ground water in the upper aquifers may be flowing south, with the deeper aquifers, the Alameda Formation, moving north. The nearest natural drainage is Peralta Creek, located approximately 1,500 feet west of the Site. Peralta Creek flows generally north to south at its closest distance from the Site.

3.2 Topography

The Site is situated at an approximate elevation of 42 feet above mean sea level. The Site is relatively flat, but slopes slightly to the southwest, consistent with the local topography.

3.3 Stratigraphy

Soils underlying the Site have been consistently characterized as interbedded layers of sandy clay or silty clay, clayey silt, clayey sand, and clayey gravel with occasional sand or gravelly sand. The presence of these soils, usually of low to very low permeability, complicate plans and limit available technologies for remediation at this Site. Copies of available lithologic soil boring logs and well construction details are provided within Appendix B. Previously constructed geologic cross-sections are provided within Appendix B also.

4.0 MONITORING WELL INSTALLATION

4.1 Proposed Well Installation Locations

To adequately characterize the extent of separate-phase hydrocarbons (i.e. free product, FP) in the vicinity of existing ground-water monitoring well MW-5, BAI proposes to have Stratus install three ground-water monitoring wells, with the potential for future use as recovery wells, in the immediate vicinity of existing ground-water monitoring well MW-5. The proposed ground-water monitoring wells are to be identified as MW-10, MW-11 and MW-12. Well MW-10 is proposed to be located approximately 15 feet south of existing well MW-5, closer to the property boundary in the down-gradient direction. Well MW-11 is proposed to be located approximately 50 feet roughly northwest of existing well MW-5. Well MW-12 is proposed to be located approximately 40 feet roughly east of existing well MW-5. The locations of proposed wells MW-10, MW-11 and MW-12 should create an effective capture zone in the vicinity of the downgradient corner of the Site which is known in well MW-5 to contain FP. The proposed locations for these new wells are shown on Drawing 2.

4.2 Soil Borings

The borings for wells MW-10, MW-11, and MW-12 will be completed under the supervision of a Stratus field geologist with the use of a drill rig equipped with 10-inch diameter hollow-stem augers. The borings will be advanced to a total depth of approximately 30 feet below ground surface (bgs) using a hollow-stem auger drilling rig. Continuous core soil samples will be collected from the soil borings using an 18-inch California-modified split-spoon sampler for lithologic description (per Unified Soil Classification System). Soil samples for chemical analyses will be retained and submitted to the analytical laboratory at five foot intervals, the capillary fringe, and at zones of detected subsurface contamination (precluding the saturated zone). Field screening for hydrocarbons will include visual and olfactory observations and portable photo-ionization detector (PID) measurements.

Each soil sample collected for chemical analysis will be covered at each end with Teflon sheeting, capped with plastic end caps, labeled, and placed in a chilled cooler for preservation. Sample labels will include the boring number, sample name, sample depth interval, sampling

date and time, analytical methods, and sampler's initials. Samples will be transported under chain-of-custody protocol to Calscience Environmental Laboratory (Garden Grove), a California state-certified analytical laboratory.

Soil samples will be analyzed for the following: Gasoline Range Organics (C6-C12) by EPA Method 8015B; and Benzene, Toluene, Ethylbenzene, and Total Xylenes (BTEX), tert-Amyl methyl ether (TAME), tert-Butyl alcohol (TBA), Di-isopropyl ether (DIPE), 1,2-Dibromo-methane (EDB), 1,2-Dichloroethane (1,2-DCA), Ethanol, Ethyl-tert-butyl ether (ETBE), and Methyl tert-butyl ether (MTBE) by EPA Method 8260B.

4.3 Monitoring Well Construction

Proposed monitoring wells MW-10, MW-11 and MW-12 will be constructed of four-inch diameter, threaded Schedule 40 PVC factory slotted casing and blank casing, installed down the center of the boring within the augers. Slotted casing (0.020 inch slots) shall be installed from total depth of the boring to approximately seven feet below ground surface, with blank casing installed from approximately seven ft bgs to approximately 0.5 ft bgs. Sorted silica sand (#3) shall be placed in the annular space from total depth to approximately six ft bgs. A bentonite plug approximately two feet thick shall be placed above the sand pack. A neat cement grout shall be placed above the bentonite to approximately 0.5 ft bgs. The well head shall be completed with a locking security plug and covered with a traffic-rated well vault. The surface completion shall be finished with neat cement and graded to drain away from the well head.

4.4 Well Development

The proposed wells should be developed no sooner than 48 hours after well installation but no more than one week after well installation. The well development process will consist of carefully surging and bailing the well to remove fine-grained sediments from the well and sand filter pack. A minimum of three and a maximum of ten wetted casing volumes of ground water will be removed until relatively silt-free water is obtained and water quality parameters have stabilized. Periodic measurements of the water quality parameters including pH, temperature, conductivity, and observed turbidity will be recorded during the development to establish baseline values for ground water. Water generated during development activities will be handled according to BP protocols and procedures.

4.5 Well Surveying

After well development, all monitoring wells associated with the Site will be surveyed. A California-licensed Professional Land Surveyor will be subcontracted to survey the well heads for top of casing elevation with respect to mean sea level, and for lateral position using Northing's and Easting's per NAD'88. Surveying should be scheduled for completion within two weeks of well completion. A stamped written report and electronic deliverable (i.e. AutoCAD file meeting GeoTracker specifications) shall be submitted following surveying activities.

4.6 Well Sampling

The wells will be sampled no sooner than 48 hours after well development. The sampling procedure for the wells consists of first measuring the water level and depth to bottom, and checking for the presence of separate phase hydrocarbons (free product) using an electronic oil-water interface probe. If the well does not contain free product, it will be purged of approximately three wetted casing volumes of water (or until dewatered) using a centrifugal pump, gas displacement pump, or bailer. During purging, temperature, pH, and electrical conductivity will be monitored to document that these parameters have stabilized prior to collecting samples. After purging, water levels will be allowed to partially (at least 80%) recover. Ground-water samples will be collected using a dedicated disposable bailer, placed into appropriate containers, labeled, logged onto chain-of-custody records, and transported on ice to the laboratory. Sample labels will include sample name, sampling time and date, analytical methods, and sampler's initials. If the well contains free product, it will not be sampled and free product will be removed according to California Code of Regulations, Title 23, Division 3, Chapter 16, Section 2655, UST Regulations. Ground-water samples will be analyzed for the following: GRO by EPA Method 8015B and BTEX, TAME, TBA, DIPE, EDB, 1,2-DCA, Ethanol, ETBE, and MTBE using EPA Method 8260B.

5.0 DUAL-PHASE EXTRACTION PILOT TESTING

5.1 Description of DPE Pilot Testing Activities

A DPE unit with a liquid-ring pump and a thermal oxidizer will be mobilized to the Site to facilitate pilot testing activities. Air and water will be extracted from selected recovery wells using an approximate one-inch diameter stinger lowered into each well. Extracted ground water and soil vapors will be directed to a water knockout tank. Processor air will be treated by the thermal oxidizer prior to discharge while ground water will be transferred to an on-site holding tank, temporarily accumulated, until transportation for disposal/treatment at an appropriate facility. Based on historical ground-water contaminant concentrations and location relative to the former UST complex, pilot testing activities will be performed on wells MW-5, MW-10, MW-11, and MW-12. Pilot testing activities will include individual well step tests, individual well constant rate tests, followed by a combined multiple well evaluation test.

The stinger depth in each well will be set at approximately two feet below static ground-water levels for testing activities. It is anticipated that the depth of the stinger will need to be adjusted during each extraction test in order to maximize recovery of soil vapors. Once ground water has been dewatered to the end of the stinger, the applied vacuum will be incrementally increased as a means to evaluate the optimal extraction rate (maximum air flow rate) during the step test. A PID will be used to record concentrations of recovered vapors during the step test. A step test is not anticipated to exceed six hours in duration consisting of various applied vacuum for one to two hour periods. After the optimum extraction flow rate from the step test has been determined, an up to 12 hour constant-rate DPE pilot test will be performed on the extraction well to observe influence, if any, in adjacent observation wells, and to observe the sustainability of recovered hydrocarbon vapors.

Individual well DPE testing (step and constant) is not expected to exceed 12 hours for each well. This is also dependent upon ability to run the test equipment prior to 7 a.m. or after 7 p.m. However, individual extractions may be terminated early based on observed conditions and decreased vapor extraction recovery rates. If hourly PID readings decrease to values below 250 parts per million volume (ppmv) and adjustment of the stinger depth does not influence PID readings for two to three continuous hours, the individual DPE constant rate extraction may be terminated after notification and discussion with BAI.

After individual well DPE testing activities have been completed, a multiple well DPE step and constant-rate test using a combination of the three on-site test wells will be performed (MW-10, MW-11, and MW-12). Accordingly, it is requested that additional supplies be available at the Site to accommodate a multiple extraction event (e.g., stingers and hoses). The multiple well extraction pilot test will be performed following the same protocol as the individual DPE pilot tests conducted on wells MW-5, MW-10, MW-11, and MW-12, and shall not exceed 12 hours in duration.

Pilot testing activities are not expected to exceed seven working days in duration. Early termination (i.e., prior to five days) of this DPE pilot test may be warranted based on field observations and decreased recovery rates. However, it is requested that BAI personnel be contacted prior to early termination of the DPE testing.

5.2 Vapor and Ground-Water Sample Collection

Vapor and ground-water samples will be collected after the first hour and every three to four hours after the initial hour of operation during each constant rate extraction. For example, if an extraction is performed for 12 hours, samples will be collected at one hour, three hours, six hours, nine hours, and twelve hours. Not all collected samples will be submitted for analysis. It is anticipated that a minimum of three vapor and three ground-water samples will be submitted for laboratory analysis for each test. Submitted samples will likely include the one hour sample, an approximate mid-point sample, and the approximate end-point sample of each extraction.

Collected samples will be submitted promptly under chain-of-custody protocol to Calscience Environmental Laboratories, Inc. in Garden Grove, California (CA-ELAP #1230, NELAP #03220CA). Submitted samples will be analyzed for GRO by EPA Method 8015M and BTEX and MTBE by EPA Method 8260B. Ground-water samples will also be analyzed for TBA, DIPE, ETBE, TAME and Ethanol by EPA Method 8260B.

5.3 Calculations of Contaminant Mass Removal

The contaminant mass recovered from both the gas-phase and liquid-phase process streams shall be calculated on a total and well-by-well basis. For the gas-phase, the calculation for contaminant mass removal (in pounds, lbs) will be the calculated removal rate (in lbs/hr) multiplied by time, using the following model equation:

lbs/hr = (“x” ppmv/1,000,000)(“Q” ft^3/min)(“M.W.” lb/lb-mol)(60 min/hr)(lb-mol/379.5 ft^3)

where: “x” is influent concentration in ppmv of GRO or Benzene;
“Q” is the average flow rate in ft^3/min; and

"M.W." is the molecular weight in lb/lb-mol (100.2 for GRO, 78.1 for Benzene).

For the liquid-phase, the calculation for contaminant mass removal (in pounds) will be calculated using the following model equation:

lbs = ("x" µg/L)(gram/1,000,000 µg)(lbs/454 grams)(3.78 L/gal)(gallons pumped)

where: "x" is influent concentration in micrograms per liter of GRO or Benzene.

Gallons of GRO and Benzene removed shall be calculated also by dividing pounds removed of each by the density of GRO (6.2 lbs/gal) and Benzene (7.3 lbs/gal).

5.4 Background Conditions and Observation Well Monitoring

Prior to initiating each DPE extraction, background depth to water level measurements will be recorded for each well associated with the Site, and the hour meter on the DPE equipment will be recorded. Field personnel will record the DPE equipment hour meter reading, applied vacuum, air flow, totalizer reading, and collect an PID reading of recovered vapors on an hourly basis during each DPE step and constant-rate test.

Remaining wells associated with the Site will be used as observation wells during step and constant-rate extraction tests. Periodic monitoring activities in surrounding observation wells will include determining if vacuum influence is observed using Magnehelic gauges (with appropriate sensitivity) installed on each observation well head in addition to recording the depth to ground water. Periodic monitoring activities on observation wells should be conducted on an hourly basis during testing activities.

6.0 PRE-MOBILIZATION ACTIVITIES

Prior to initiating field activities, Stratus will obtain the necessary permits from Alameda County; prepare a site health and safety plan (HASP) for the proposed work; clear the Site for subsurface utilities; and provide 72-hour advance written notification(s) to ACEH (email preferred to paresh.khatri@acgov.org) and BAI (email tvenus@broadbentinc.com or mobile phone 530-588-5887) prior to the start of field activities. The utility clearance will include notifying Underground Service Alert (USA) of the pending work a minimum of 48 hours prior to initiating the subsurface field investigation. In addition, the services of a private underground utility locator will be utilized.

The Site-specific HASP will be prepared for use by personnel implementing the work plan. The HASP will address the proposed soil boring/monitoring well construction and DPE pilot testing scope of work. A copy of the HASP will be available on-site during work. The subcontractor(s) performing field activities will be provided with a copy of the HASP prior to initiating work. A safety tailgate meeting will also be conducted daily to review the Site hazards and work scope.

7.0 DOCUMENTATION AND REPORTING

Upon completion of the work activities described above and after receipt of laboratory analytical data, it is expected that Stratus will submit a data package including the following information at a minimum:

- Brief descriptions of the work performed;
- Copies of the required permits;
- Copies of all field notes;
- Soil boring logs;
- Well construction diagrams;
- Well drillers reports;
- Surveyor's report;
- Tabulated results and measurements; and
- Laboratory analytical reports with copies of chain-of-custody records.

BAI shall use the data and information provided above to prepare a Soil & Water Investigation with DPE Feasibility Study Report. BAI plans to incorporate into this resulting report the requested preferential pathway evaluation unless significant delays are encountered obtaining the requested plans.

8.0 PROPOSED SCHEDULE

The schedule for the above-noted work shall proceed as follows:

- Implementation of Monitoring Well Installation – Upon approval of this work plan, obtaining the necessary permits, and scheduling the required subcontractors;
- DPE Pilot Testing – Upon installation, development, sampling, and surveying of the monitoring/recovery wells, obtaining the necessary permits, and scheduling the required subcontractors;
- Submittal of Soil & Water Investigation with DPE Feasibility Study Report – Within 60 days after receipt of certified field data package following completion of field work, receipt of confidential well records from DWR, and receipt of remaining plans requested from subsurface utility owners/operators.

9.0 CLOSURE

Discovery of hazardous or regulated materials constitutes a changed condition mandating a renegotiation of the scope of work described herein or termination of services. BAI will endeavor to alert the client of matters which, in the opinion of BAI, require immediate attention to protect the public health, safety, and environment. BAI will endeavor to advise the client of matters which should be reported to proper governmental entities. However, the client is solely responsible for reporting such matters and BAI shall not be held liable in the event the proper agency is not notified. Our services will be performed in accordance with the generally accepted practice at the time work commences. Results and recommendations will be based on laboratory results, observations of Stratus field personnel, and the points investigated. No other warranty,

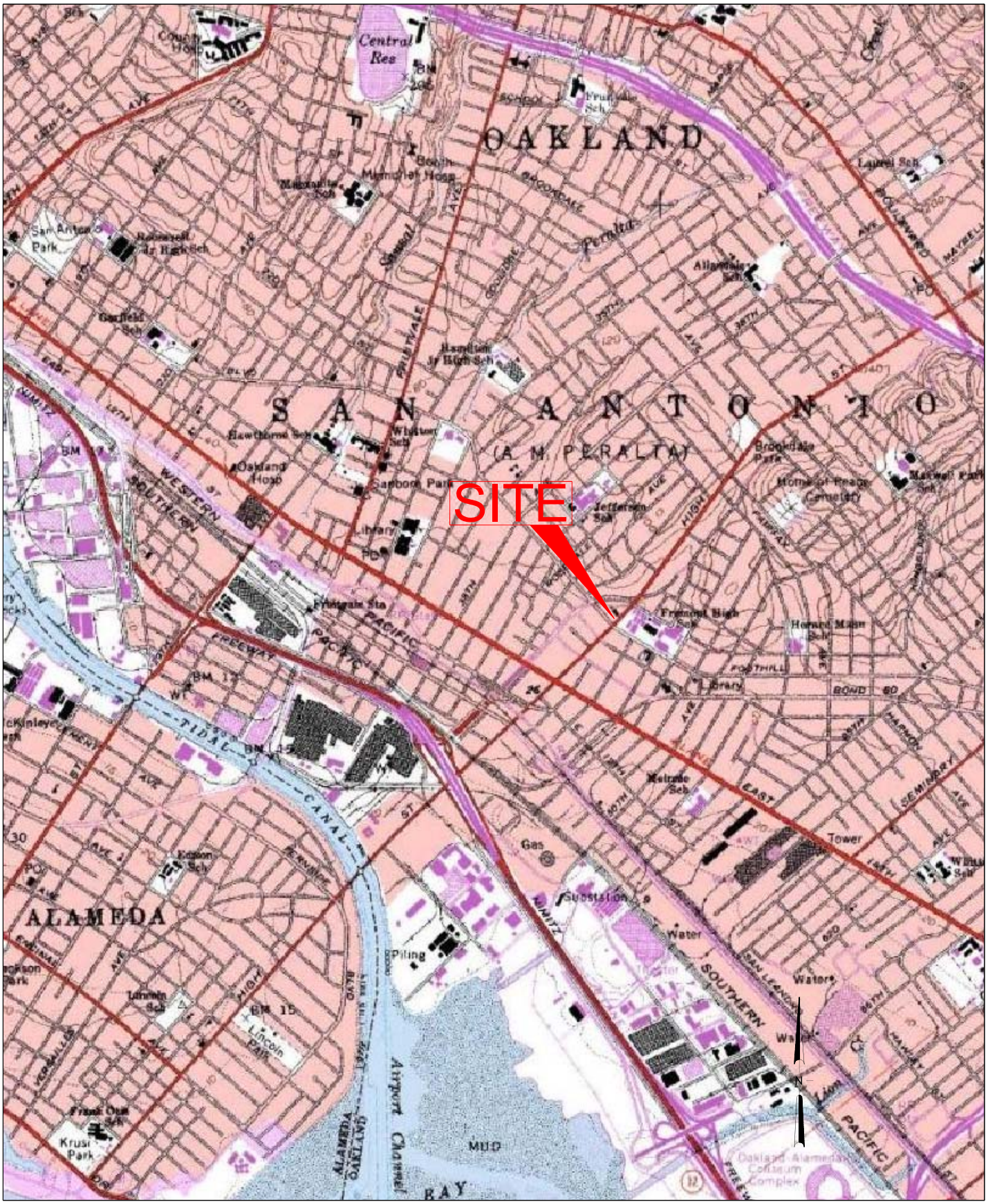
expressed on implied was made. This report has been prepared for the exclusive use of Atlantic Richfield Company.

10.0 REFERENCES

ACEH, 5 December 2008. *Fuel Leak Case No. RO0000426 and GeoTracker Global ID T0600100213, BP #11109, 3201 35th Avenue, Oakland, CA 94619.* Submitted by Mr. Paresh Khatri to Messrs. Paul Supple for Atlantic Richfield Company, Terry Grayson for Conoco Phillips, and Steve Mahoney, Khalid & Romana Usman.

BAI, 7 November 2008. *Initial Site Conceptual Model, Former BP Station #11109, 4280 Foothill Boulevard, Oakland, California; ACEH Case #RO0000426.* Submitted to Messrs. Paul Supple for Atlantic Richfield Company and Mr. Paresh Khatri for ACEH.

California Regional Water Quality control Board, San Francisco Bay Region, Groundwater Committee, June 1999. *East Bay Plain Groundwater Basin Beneficial Use Evaluation Report, Alameda and Contra Costa Counties, CA.*

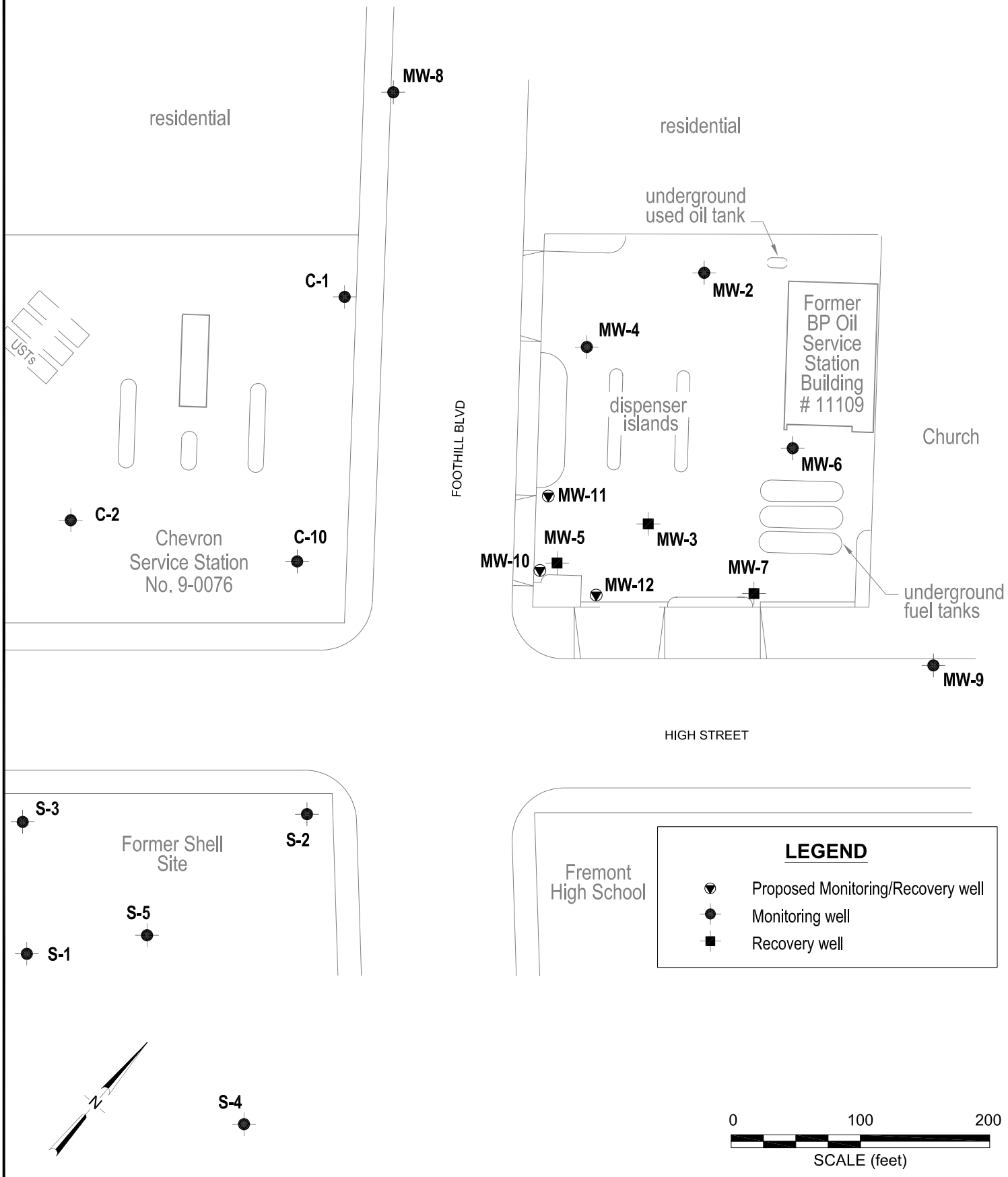


BROADBENT & ASSOCIATES, INC.
ENGINEERING, WATER RESOURCES & ENVIRONMENTAL
1324 Mangrove Ave. Suite 212, Chico, California
Project No.: 06-08-646 Date: 10/31/08

Former BP Station #11109
4280 Foothill Boulevard
Oakland, California

Site Location Map

Drawing
1



BROADBENT & ASSOCIATES, INC. ENGINEERING, WATER RESOURCES & ENVIRONMENTAL 1324 Mangrove Ave. Suite 212, Chico, California Project No.: 06-08-646 Date: 11/7/08	Former BP Station #11109 4280 Foothill Boulevard Oakland, California	Site Layout Plan with Proposed Monitoring/Recovery Well Locations

Drawing
2

APPENDIX A

Recent Regulatory Correspondence

ALAMEDA COUNTY
HEALTH CARE SERVICES
AGENCY
DAVID J. KEARS, Agency Director

ENVIRONMENTAL HEALTH SERVICES
ENVIRONMENTAL PROTECTION
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December 5, 2008

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Terry Grayson
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Khalid & Romana Usman
3670 Ralston Avenue
Hillsborough, CA 94010

Subject: Fuel Leak Case No. RO0000426 and GeoTracker Global ID T0600100217, BP #11109, 4280 Foothill Boulevard, Oakland, CA 94601

Dear Mr. Supple:

Alameda County Environmental Health (ACEH) staff has reviewed the case file for the above-referenced site including the recently submitted document entitled, "Initial Site Conceptual Model," dated November 7, 2008, which was prepared by Broadbent & Associates, Inc. (BAI) for the subject site. The report summarizes the apparent data gaps identified in the Site Conceptual Model (SCM) and proposes a scope of work to address those data gaps.

ACEH generally concurs with the BAI's recommendations and proposed scope of work. However, sufficient detail was not presented to approve the proposed well installations and subsequent pilot testing (interim remedial action). ACEH requests that you address the following technical comments, perform the proposed preferential pathway evaluation, and send us the technical reports described below.

TECHNICAL COMMENTS

1. **Preferential Pathway Study** – BAI proposes to conduct a preferential pathway evaluation at the site. Since free product is still present and groundwater is relatively shallow at the site, a preferential pathway evaluation appears warranted. The purpose of the preferential pathway study is to locate potential migration pathways and conduits and determine the probability of the NAPL and/or plume encountering preferential pathways and conduits that could spread contamination. We request that you perform a preferential pathway study that details the potential migration pathways and potential conduits (wells, utilities, pipelines, etc.) for vertical and lateral migration that may be present in the vicinity of the site.

   Discuss your analysis and interpretation of the results of the preferential pathway study (including the detailed well survey and utility survey requested below) and report your results

in the Soil and Groundwater Investigation Work Plan requested below. The results of your study shall contain all information required by California Code of Regulations, Title 23, Division 3, Chapter 16, §2654(b).

a. Utility Survey

An evaluation of all utility lines and trenches (including sewers, storm drains, pipelines, trench backfill, etc.) within and near the site and plume area(s) is required as part of your study. Please include maps and cross-sections illustrating the location and depth of all utility lines and trenches within and near the site and plume areas(s) as part of your study.

b. Well Survey

The preferential pathway study shall include a well survey of all wells (monitoring and production wells: active, inactive, standby, decommissioned (sealed with concrete), abandoned (improperly decommissioned or lost); and dewatering, drainage, and cathodic protection wells) within a ¼ mile radius of the subject site. As part of your well survey, please perform a background study of the historical land uses of the site and properties in the vicinity of the site. Use the results of your background study to determine the existence of unrecorded/unknown (abandoned) wells, which can act as contaminant migration pathways at or from your site. Please review and submit copies of historical maps, such as Sanborn maps, aerial photographs, etc., when conducting the background study.

2. **Soil and Groundwater Characterization & Vapor Phase and/or DPE Pilot Test** – To adequately characterize the extent of free phase petroleum hydrocarbons in the vicinity of groundwater monitoring well MW-5, BAI proposes to install three groundwater monitoring wells, with the potential for future use as recovery wells, in the immediate vicinity of existing groundwater monitoring well MW-5. Although the scope of work is conceptually acceptable, sufficient detail was not presented in the SCM. The depth and screened intervals of the wells were proposed, but the diameter of the well was not mentioned nor was rationale for the selected well locations adequately detailed.

A vapor phase and/or dual-phase extraction (DPE) pilot test utilizing the existing and newly installed wells would be performed during a 5-day mobile test event. The pilot test has been referred to as an interim remedial measure, thereby precluding the preparation of a formal feasibility study (FS), which would evaluate several cleanup alternatives that would have likelihood for successfully cleaning up the site. Although ACEH encourages the preparation of an FS, it is not a requirement for an interim remedial measure. However, ACEH does require that the proposed pilot test be adequately detailed so that an evaluation can be conducted, as well as include cleanup levels and cleanup goals. At a minimum, the following should be discussed in the work plan.

- Statement of objectives
- Description of site lithology, including intrinsic permeability and soil moisture content in the unsaturated zone, and applicability of proposed remediation alternative.

- Baseline data collected during earlier investigation phases that may be relevant in describing initial conditions.
- Proposed system start-up operating procedures that will be used.
- Proposed time and duration of testing for each well or well(s) and identification of observation wells.
- Frequency of pressure and vacuum measurements taken at blowers and other above ground equipment.
- Pressure and vacuum measurements in recovery wells (before and after balancing flows and in vadose zone monitoring points, if applicable.
- Proposed number of samples to be collected and analyzed for influent and effluent groundwater and gas (vapor).
- Proposed calculations to estimate contaminant mass in the subsurface and recovered contaminant mass in water and gas streams, both total and on a well-by-well basis, if possible.
- Corrective action design in relation to site conditions.

Please prepare a scope of work to address the above-mentioned concerns and submit a work plan due by the date specified below.

NOTIFICATION OF FIELDWORK ACTIVITIES

Please schedule and complete the fieldwork activities by the date specified below and provide ACEH with at least three (3) business days notification prior to conducting the fieldwork.

TECHNICAL REPORT REQUEST

Please submit technical reports to ACEH (Attention: Paresh Khatri), according to the following schedule:

- **February 3, 2009** – Interim Remedial Action Plan
- **April 30, 2009** – Semi-annual Monitoring Report (1st Quarter 2009)
- **October 30, 2009** – Semi-annual Monitoring Report (3rd Quarter 2009)

These reports are being requested pursuant to California Health and Safety Code Section 25296.10. 23 CCR Sections 2652 through 2654, and 2721 through 2728 outline the responsibilities of a responsible party in response to an unauthorized release from a petroleum UST system, and require your compliance with this request.

ELECTRONIC SUBMITTAL OF REPORTS

ACEH's Environmental Cleanup Oversight Programs (LOP and SLIC) require submission of reports in electronic form. The electronic copy replaces paper copies and is expected to be used

for all public information requests, regulatory review, and compliance/enforcement activities. Instructions for submission of electronic documents to the Alameda County Environmental Cleanup Oversight Program FTP site are provided on the attached "Electronic Report Upload Instructions." Submission of reports to the Alameda County FTP site is an addition to existing requirements for electronic submittal of information to the State Water Resources Control Board (SWRCB) GeoTracker website. In September 2004, the SWRCB adopted regulations that require electronic submittal of information for all groundwater cleanup programs. For several years, responsible parties for cleanup of leaks from underground storage tanks (USTs) have been required to submit groundwater analytical data, surveyed locations of monitoring wells, and other data to the GeoTracker database over the Internet. Beginning July 1, 2005, these same reporting requirements were added to Spills, Leaks, Investigations, and Cleanup (SLIC) sites. Beginning July 1, 2005, electronic submittal of a complete copy of all reports for all sites is required in GeoTracker (in PDF format). Please visit the SWRCB website for more information on these requirements (http://www.swrcb.ca.gov/ust/electronic_submittal/report_rqmts.shtml.

PERJURY STATEMENT

All work plans, technical reports, or technical documents submitted to ACEH must be accompanied by a cover letter from the responsible party that states, at a minimum, the following: "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." This letter must be signed by an officer or legally authorized representative of your company. Please include a cover letter satisfying these requirements with all future reports and technical documents submitted for this fuel leak case.

PROFESSIONAL CERTIFICATION & CONCLUSIONS/RECOMMENDATIONS

The California Business and Professions Code (Sections 6735, 6835, and 7835.1) requires that work plans and technical or implementation reports containing geologic or engineering evaluations and/or judgments be performed under the direction of an appropriately registered or certified professional. For your submittal to be considered a valid technical report, you are to present site specific data, data interpretations, and recommendations prepared by an appropriately licensed professional and include the professional registration stamp, signature, and statement of professional certification. Please ensure all that all technical reports submitted for this fuel leak case meet this requirement.

UNDERGROUND STORAGE TANK CLEANUP FUND

Please note that delays in investigation, later reports, or enforcement actions may result in your becoming ineligible to receive grant money from the state's Underground Storage Tank Cleanup Fund (Senate Bill 2004) to reimburse you for the cost of cleanup.

AGENCY OVERSIGHT

If it appears as though significant delays are occurring or reports are not submitted as requested, we will consider referring your case to the Regional Board or other appropriate agency, including the County District Attorney, for possible enforcement actions. California Health and Safety

Code, Section 25299.76 authorizes enforcement including administrative action or monetary penalties of up to $10,000 per day for each day of violation.

If you have any questions, please call me at (510) 777-2478 or send me an electronic mail message at paresh.khatri@acgov.org.

Sincerely,

Paresh C. Khatri
Hazardous Materials Specialist

Donna L. Drogos, PE
Supervising Hazardous Materials Specialist

Enclosure: ACEH Electronic Report Upload (ftp) Instructions

cc: Tom Venus, Broadbent & Associates, 1324 Mangrove Avenue, Suite 212, Chico, CA 95926
Leroy Griffin, Oakland Fire Department, 250 Frank H. Ogawa Plaza, Ste. 3341, Oakland, CA 94612-2032
Donna Drogos, ACEH
Paresh Khatri, ACEH
File

Alameda County Environmental Cleanup Oversight Programs (LOP and SLIC)	**ISSUE DATE:** July 5, 2005
	REVISION DATE: December 16, 2005
	PREVIOUS REVISIONS: October 31, 2005
SECTION: Miscellaneous Administrative Topics & Procedures	**SUBJECT:** Electronic Report Upload (ftp) Instructions

Effective **January 31, 2006**, the Alameda County Environmental Cleanup Oversight Programs (LOP and SLIC) require submission of all reports in electronic form to the county's ftp site. Paper copies of reports will no longer be accepted. The electronic copy replaces the paper copy and will be used for all public information requests, regulatory review, and compliance/enforcement activities.

REQUIREMENTS

- Entire report including cover letter must be submitted to the ftp site as **a single portable document format (PDF) with no password protection**. (Please do not submit reports as attachments to electronic mail.)
- It is **preferable** that reports be converted to PDF format from their original format, (e.g., Microsoft Word) rather than scanned.
- Signature pages and perjury statements **must** be included and have either original or electronic signature.
- **Do not password protect the document**. Once indexed and inserted into the correct electronic case file, the document will be secured in compliance with the County's current security standards and a password. **Documents with password protection will not be accepted**.
- Each page in the PDF document should be rotated in the direction that will make it easiest to read on a computer monitor.
- Reports must be named and saved using the following naming convention:
  RO#_Report Name_Year-Month-Date (e.g., RO#5555_WorkPlan_2005-06-14)

Additional Recommendations

- A separate copy of the tables in the document should be submitted by e-mail to your Caseworker in **Excel** format. These are for use by assigned Caseworker only.

Submission Instructions

1) Obtain User Name and Password:
   a) Contact the Alameda County Environmental Health Department to obtain a User Name and Password to upload files to the ftp site.
      i) Send an e-mail to dehloptoxic@acgov.org
         or
      ii) Send a fax on company letterhead to (510) 337-9335, to the attention of Alicia Lam-Finneke.
   b) In the subject line of your request, be sure to include **"ftp PASSWORD REQUEST"** and in the body of your request, include the **Contact Information, Site Addresses**, and the **Case Numbers (RO# available in Geotracker) you will be posting for**.

2) Upload Files to the ftp Site
   a) Using Internet Explorer (IE4+), go to ftp://alcoftp1.acgov.org
      (i) Note: Netscape and Firefox browsers will not open the FTP site.
   b) Click on File, then on Login As.
   c) Enter your User Name and Password. (Note: Both are Case Sensitive.)
   d) Open "My Computer" on your computer and navigate to the file(s) you wish to upload to the ftp site.
   e) With both "My Computer" and the ftp site open in separate windows, drag and drop the file(s) from "My Computer" to the ftp window.

3) Send E-mail Notifications to the Environmental Cleanup Oversight Programs
   a) Send email to dehloptoxic@acgov.org notify us that you have placed a report on our ftp site.
   b) Copy your Caseworker on the e-mail. Your Caseworker's e-mail address is the entire first name then a period and entire last name at acgov.org. (e.g., firstname.lastname@acgov.org)
   c) The subject line of the e-mail must start with the RO# followed by **Report Upload**. (e.g., Subject: RO1234 Report Upload)

APPENDIX B

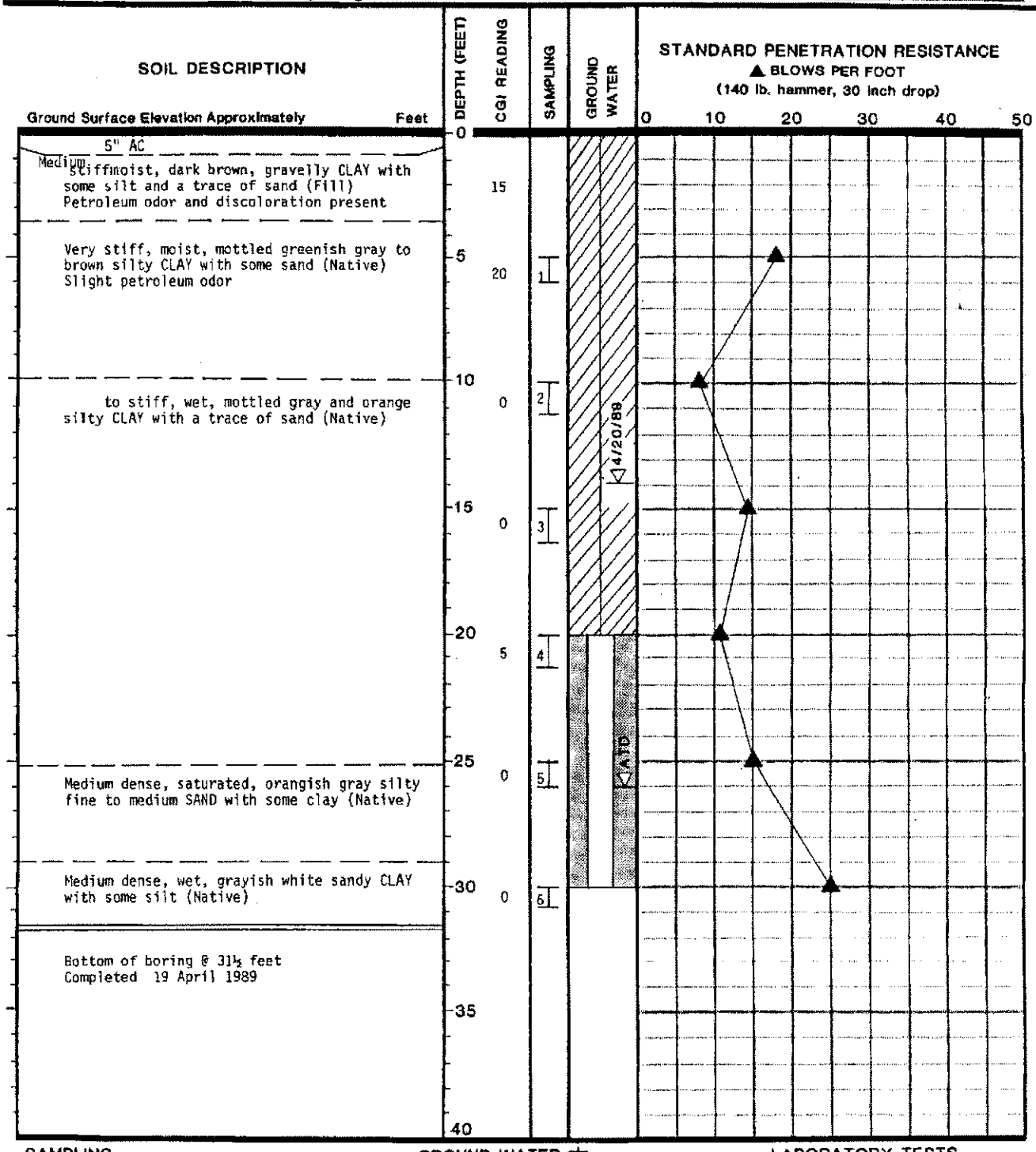
Soil Boring/Monitoring Well Construction Logs
and
Geologic Cross-Sections

RZA

RITTENHOUSE-ZEMAN & ASSOC., INC.
Geotechnical / Hydrogeological Consultants

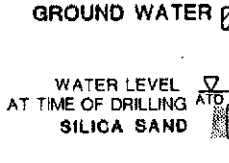
BORING NUMBER B-1 W.O. W-6095

PROJECT NAME Oakland, CA Mobil



SAMPLING
- I 2" OD SPLIT SPOON SAMPLE
- II 3" OD SHELBY SAMPLE
- ⊠ 2.5" ID RING SAMPLE
- B BULK SAMPLE
- ★ SAMPLE NOT RECOVERED

GROUND WATER



LABORATORY TESTS
- ● % WATER CONTENT
- NP NON PLASTIC

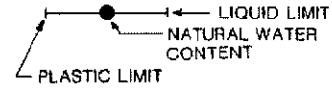
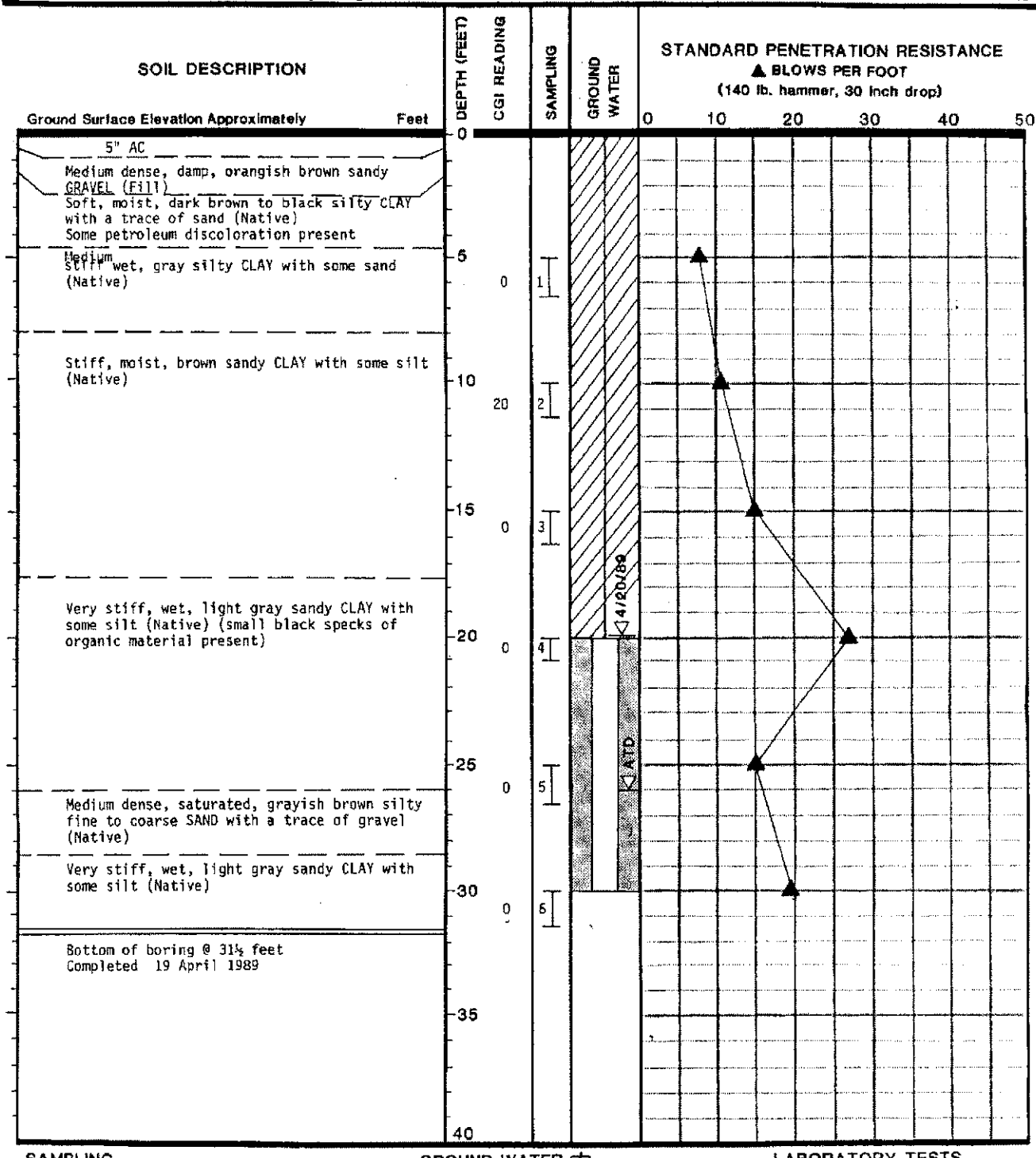


FIGURE 2

RZA

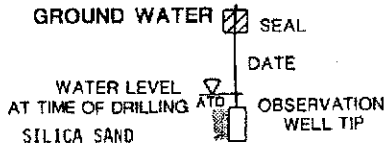
RITTENHOUSE-ZEMAN & ASSOC., INC.
Geotechnical / Hydrogeological Consultants

BORING NUMBER B-2 W.O. W-6095
PROJECT NAME Oakland, CA Mobil



SAMPLING
- 2" OD SPLIT SPOON SAMPLE
- 3" OD SHELBY SAMPLE
- 2.5" ID RING SAMPLE
- B BULK SAMPLE
- * SAMPLE NOT RECOVERED

GROUND WATER



LABORATORY TESTS

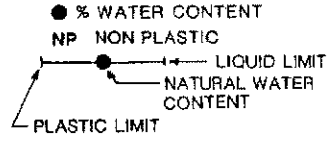


FIGURE 3

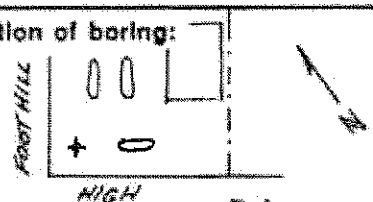
ALTON GEOSCIENCE

LOG OF EXPLORATORY BORING

PROJECT NO. 30-103 DATE 01/29/90
CLIENT Mobil Oil Corporation
LOCATION 4280 Foothill Blvd., Oakland
LOGGED BY B. Nagle DRILLER Bayland

BORING NO. B-3
Sheet 1 of 1

Field location of boring:



Ground Elev. Datum

Drilling method Hollow-stem auger
Hole Dia. 10"

Casing Installation Data 4" perforated (0.020") pipe 32-20', #3 lonestar sand 33-18', bentonite pellets 18-17'; cement seal to surface.

Water Level	6.72	20.28				
Time	11:00	13:51				
Date	1/29/90	2/05/90				

Blow Counts	PID/OVA	Depth	Sample	Soil Group Symbol (USCS)	Litho-graphic Symbol	DESCRIPTION
						3" asphalt; 6" baserock
		2		CL		SILTY CLAY: Black, moist, high plasticity.
	25	4				Appearance of fine to coarse grained sand; color change to dark brown.
3,4,8	50	6		CL		
		8				SILTY CLAY: Mottled olive green/brown, moist, moderate plasticity, stiff; gravels up to ¼".
		10				
10,13,17	40	12		CL		SANDY CLAY: Brown, moist, low plasticity, very stiff; gravels up to ½".
		14				Driller felt auger out of gravels at 13'
6,7,9	40	16				SILTY CLAY: Tan, damp to moist, medium plasticity, stiff, blue-gray staining along occasional rootlets.
		18				
		20		CL		Change to very moist, increase in ½" carbon granules.
5,9,10	25	22				
		24				
4,9,15	50	26				SANDY CLAY: Blue-gray to tan, moist, low plasticity, stiff.
	100 in Shoe	28		CL		Color change to light gray.
5,6,9		30				Top of 32'-33½' sample wet with sandy gravel stringers up to 2".
7,10,14		32		CL		SILTY CLAY: Mottled brown and gray, damp, medium plasticity, very stiff.
						Boring terminated at 33½'. Free ground water encountered at approximately 31'.

ALTON GEOSCIENCE

LOG OF EXPLORATORY BORING

PROJECT NO. 30-103 DATE 01/30/90
CLIENT Mobil Oil Corporation
LOCATION 4280 Foothill Blvd., Oakland
LOGGED BY B. Nagle DRILLER Bayland

BORING NO B-4
Sheet 1 of 1

Field location of boring:

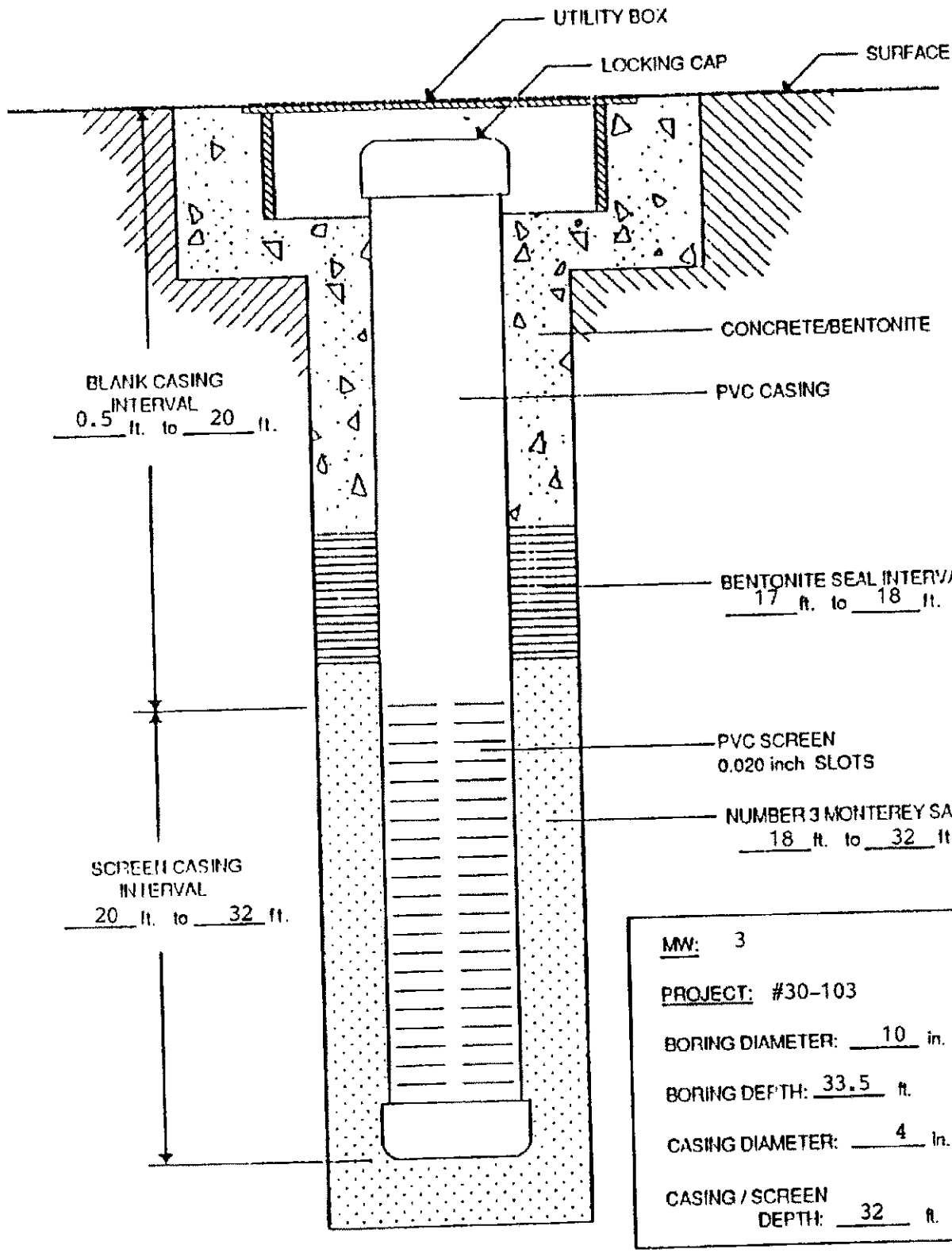
Ground Elev. HIGH Datum

Drilling method Hollow-stem auger
Hole Dia. 10"
Casing Installation Data 4" perforated (0.020") pipe
27-20': #3 lonestar 27-18½, bentonite pellets 18½-17½; neat cement seal 17½ to surface.

Water Level	17.07	16.32				
Time	13:30	13:15				
Date	1/30/90	2/05/90				

Blow Counts	PID / OVA	Depth	Sample	Soil Group Symbol (uscs)	Litho-graphic Symbol	DESCRIPTION
						4" asphalt, 6" baserock
		2				
						SILTY CLAY: Dark brown, damp to moist, high plasticity,
		4				stiff.
4,7,7	20	6				SILTY CLAY: Mottled orange-brown, damp, low plasticity,
						stiff; minor fine sand and angular gravels up to ¼".
		8				
						SANDY CLAY: Light brown, damp, medium plasticity, stiff;
		10				occasional carbon granules.
3,5,7	40					
		12				Driller felt increase in resistance at 13½ feet.
		14				CLAYEY SAND: Brown, moist, medium dense; occasional fine to
						coarse grained gravels up to ¼".
		16				
6,9,11	25					Driller felt smoother drilling at approximately 17'.
		18				
		20	▽			
4,5,13		▼				SANDY CLAY: Light brown, moist, low plasticity, stiff
		22				CLAYEY SAND: Light brown, wet, medium dense.
		24		?—?	?—?	SILTY CLAY: Mottled blue gray and brown, low plasticity,
5,9,12	75	26				very stiff; minor very fine sand.
						Driller needed more pressure to drill at 27'.
		28				
3,7,10	70					CLAYEY SILT: Whiteish gray to tan, moist, low plasticity,
						very stiff; some fine sand.
						Boring terminated at 29½ feet.
						Free ground water encountered at approximately 20 feet.

MONITORING WELL CONSTRUCTION DETAIL



MW: 3

PROJECT: #30-103

BORING DIAMETER: 10 in.

BORING DEPTH: 33.5 ft.

CASING DIAMETER: 4 in.

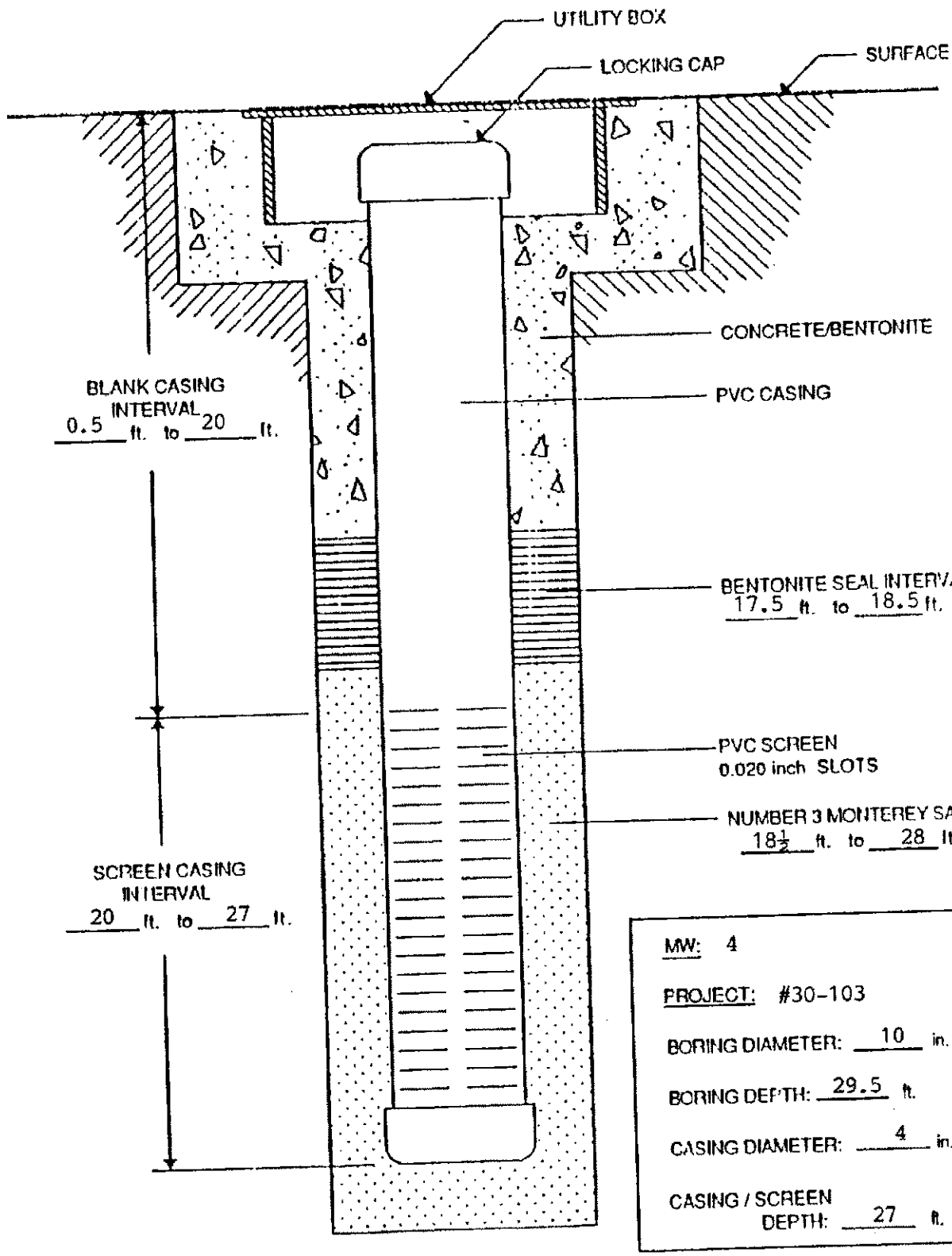
CASING / SCREEN DEPTH: 32 ft.

ALTON GEOSCIENCE
1170 BURNETT AVE., STE S
CONCORD, CA. 94520

NOTE: DRAWING IS NOT TO SCALE

PROJECT #30-103

MONITORING WELL CONSTRUCTION DETAIL



MW: 4

PROJECT: #30-103

BORING DIAMETER: 10 in.

BORING DEPTH: 29.5 ft.

CASING DIAMETER: 4 in.

CASING / SCREEN DEPTH: 27 ft.

ALTON GEOSCIENCE
1170 BURNETT AVE., STE S
CONCORD, CA. 94520

NOTE: DRAWING IS NOT TO SCALE PROJECT #30-103

ALTON GEOSCIENCE
LOG OF EXPLORATORY BORING

PROJECT NO. 30-0248 DATE DRILLED 9/09/91
CLIENT BP Oil Co., Service Station No. 30-0248
LOCATION 4280 Foothill Blvd., Oakland, CA
LOGGED BY B. Nagle APPROVED BY

BORING NO. MW-5
WELL NO. MW-5

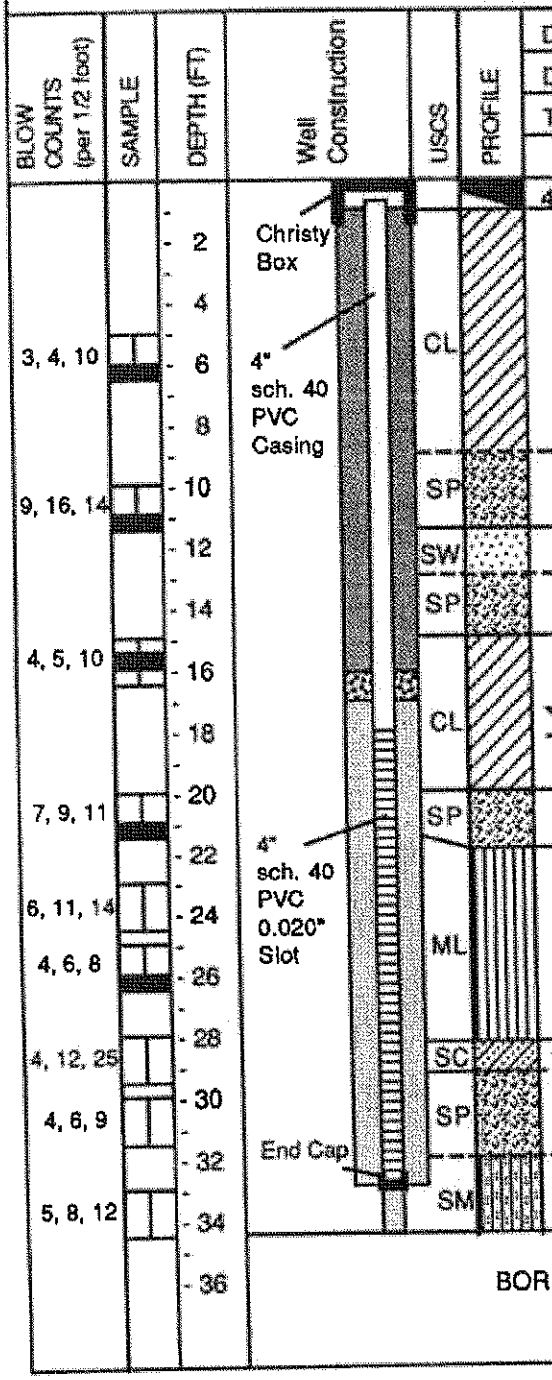
FIELD SKETCH OF BORING LOCATION

(SEE SITE PLAN)

TOP OF CASING ELEVATION 36.55

DRILLING METHOD C.M.E. 55, HSA HOLE DIAM. 10"
SAMPLER TYPE California Modified Split-Spoon Sampler
CASING DATA 4" diameter, Schedule 40 PVC, 18' blank, 15' slotted
DRILLER Soils Exploration

DEPTH TO WATER	18.08'	18.55'	18.66'
DATE	10/03/91	10/15/91	12/16/91
TIME	--	--	--



COMMENTS

4" Asphalt, 2" Road Base

SILTY CLAY: dark brown, damp, moderate plasticity.

SILTY CLAY: dark brown with olive gray mottling, stiff; occasional sand and gravel.

SANDY CLAY: olive green, damp, low plasticity.

GRAVELY SAND: olive green, damp, medium dense.

SAND: olive green, damp, fine grained.

GRAVELY SAND: olive green, damp.

SILTY CLAY: light brown, damp, medium plasticity, stiff; olive green staining along occasional rootlets, minor fine grained sand.

GRAVELY SAND: olive gray to brown to gray, moist, medium dense; hydrocarbon sheen.

CLAYEYSILT: tan, moist, stiff, with minor sands; blue-gray staining along occasional rootlets at 25'.

SAME, firm.

CLAYEY SAND: mottled tan and bluish gray, wet, very stiff.

GRAVELY SAND: gray, wet, loose to medium dense; abundant silty sand lenses.

SILTY SAND: light brown, moist, stiff to very stiff; occasional wet sandy gravel.

BORING TERMINATED AT 34.5 FEET BELOW GRADE.

ALTON GEOSCIENCE
LOG OF EXPLORATORY BORING

PROJECT NO. 30-0248 DATE DRILLED 9/09/91
CLIENT BP Oil Co., Service Station No. 30-0248
LOCATION 4280 Foothill Blvd., Oakland, CA
LOGGED BY B. Nagle APPROVED BY

BORING NO. MW-6
WELL NO. MW-6

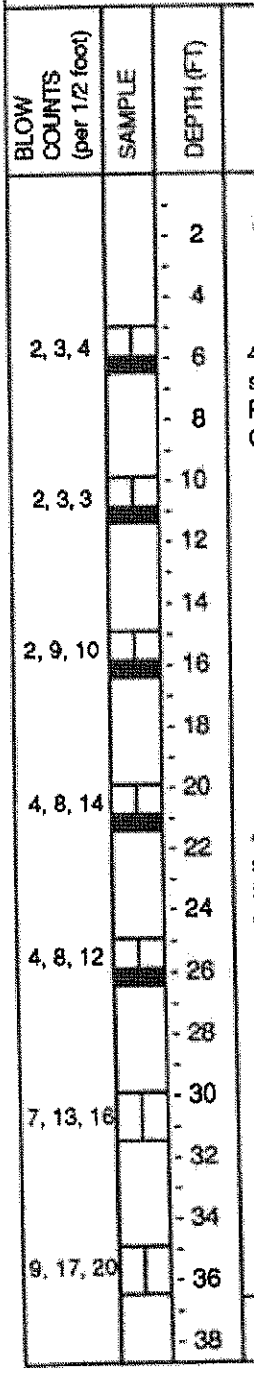
FIELD SKETCH OF BORING LOCATION

(SEE SITE PLAN)

TOP OF CASING ELEVATION

DRILLING METHOD C.M.E. 55, HSA HOLE DIAM. 10"
SAMPLER TYPE California Modified Split-Spoon Sampler
CASING DATA 4" diameter, Schedule 40 PVC, 20' blank, 15' slotted
DRILLER Soils Exploration

DEPTH TO WATER	20.73'	21.20'	21.12'
DATE	10/03/91	10/15/91	12/16/91
TIME	--	--	--



COMMENTS
4" Asphalt, 1" Road Base and Pea Gravel
SILTY CLAY: dark brown, damp.
SILTY CLAY: tan, damp, firm, some sand, occasional gravel. Abundant pea gravel at approximately 7 to 9 feet.
SAND: brown, damp, loose, fine grained, no fines; with thin clay bed.
SILTY SAND: tan, mottled olive green, damp,: occasional gravels to 1/2".
SILTY CLAY: tan, mottled olive green, damp, medium plasticity, stiff.
CLAYEY SAND: tan, damp, medium dense, fine to coarse grained.
SAME: increase in sand content, bluish gray staining at 25.5' to 26'.
SILTY - CLAYEY SAND: light tan, moist, medium dense.
SILTY SAND: tan, wet, medium dense; with occasional gravel lenses.
BORING TERMINATED AT 36.5 FEET BELOW GRADE.

ALTON GEOSCIENCE
LOG OF EXPLORATORY BORING

PROJECT NO. 30-0248 DATE DRILLED 9/09/91
CLIENT BP Oil Co., Service Station No. 30-0248
LOCATION 4280 Foothill Blvd., Oakland, CA
LOGGED BY B. Nagle APPROVED BY

BORING NO. MW-7
WELL NO. MW-7
Page 1 of 1

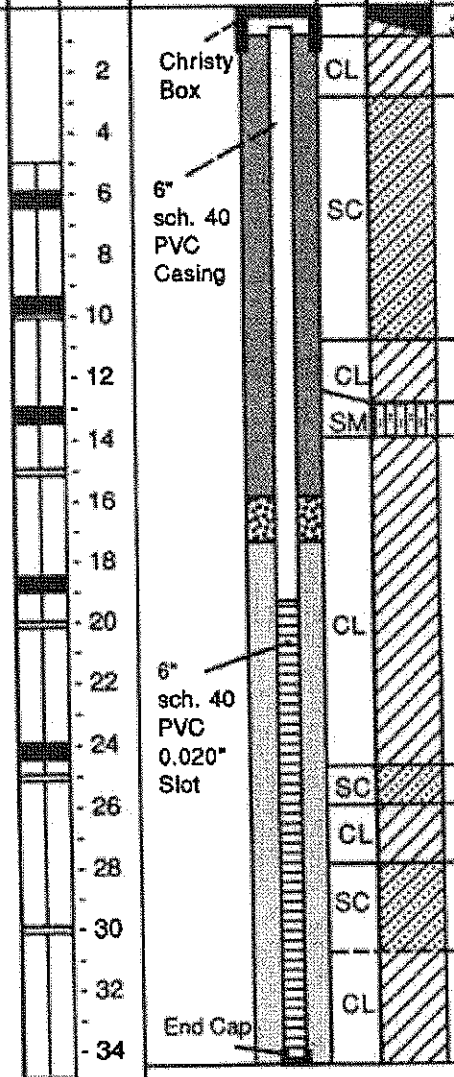
FIELD SKETCH OF BORING LOCATION

(SEE SITE PLAN)

TOP OF CASING ELEVATION

DRILLING METHOD C.M.E. 55, HSA HOLE DIAM. 12"
SAMPLER TYPE Continuous
CASING DATA 6" diameter, Schedule 40 PVC, 19.5 blank, 15 slotted
DRILLER Soils Exploration

DEPTH TO WATER	14.93'	15.16'	15.21'
DATE	10/03/91	10/15/91	12/16/91
TIME	--	--	--



COMMENTS
3" Asphalt, 6" Road Base
SILTY CLAY: dark brown, damp, medium plasticity.
CLAYEY SAND: bluish gray, damp; occasional gravel up to 1" diameter. SAME: brown to bluish gray, damp; abundant gravel, occasional silty clay lens.
SILTY CLAY: mottled bluish gray - orange brown, damp, medium plasticity; stained along rootlets.
SILTY SAND: bluish gray to brown, damp.
SILTY CLAY: mottled bluish gray - orange brown, damp, medium plasticity; stiff. SAME: mottled bluish gray - orange brown, damp, medium plasticity; stiff. SANDY CLAY: mottled bluish gray - olive green, damp, medium plasticity, very stiff. SILTY CLAY: brown, damp, medium plasticity, very stiff. SANDY CLAY: olive green, wet, low plasticity.
CLAYEY SAND: brown, wet, medium dense.
SANDY CLAY: tan, moist to wet, low plasticity.
CLAYEY SAND: tan, wet, medium dense; some orange brown mottling.
SANDY CLAY: tan, moist to wet, low plasticity, stiff; increasing sand at 34', clay fractions along horizontal planes.
BORING TERMINATED AT 34.5 FEET BELOW GRADE.

ALTON GEOSCIENCE
LOG OF EXPLORATORY BORING

PROJECT NO. 30-0248 DATE DRILLED 9/11/91
CLIENT BP Oil Co., Service Station No. 30-0248
LOCATION 4280 Foothill Blvd., Oakland, CA
LOGGED BY B. Nagle APPROVED BY

BORING NO. MW-8
WELL NO. MW-8
Page 1 of 1

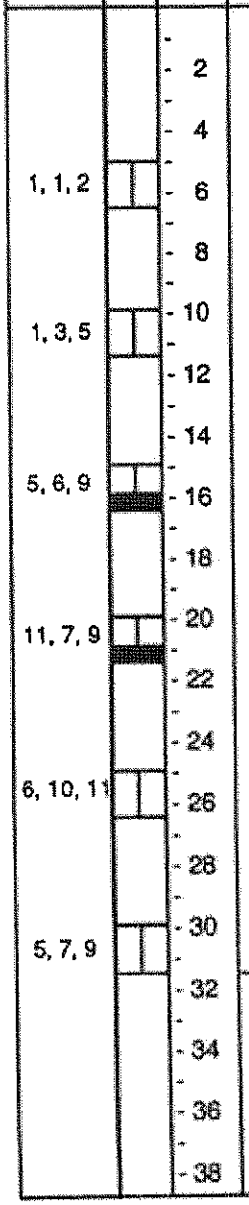
FIELD SKETCH OF BORING LOCATION

(SEE SITE PLAN)

TOP OF CASING ELEVATION

DRILLING METHOD C.M.E. 55, HSA HOLE DIAM. 8"
SAMPLER TYPE California Modified Split-Spoon Sampler
CASING DATA 2" diameter, Schedule 40 PVC, 19' blank, 13' slotted
DRILLER Soils Exploration

DEPTH TO WATER	22.37'	22.70'	22.47'
DATE	10/03/91	10/15/91	12/16/91
TIME	--	--	--



COMMENTS

3" Asphalt, 4" Concrete, 12" Road Base and Pea Gravel

SILTY CLAY: dark brown, damp, moderate plasticity.

SANDY CLAY: mottled light - dark brown, moist, low plasticity, soft; abundant coarse grained sand.

SAME: light brown, moist, firm; fine grained sand.

SILTY CLAY: brown, damp, low plasticity, stiff; abundant coarse grained sand.

CLAYEY GRAVEL: lens.

SILTY CLAY: brown, wet, medium plasticity, stiff; abundant coarse grained sand.

CLAYEY SAND: light brown, wet, medium dense.

SILTY CLAY: light brown, damp, medium plasticity, stiff; occasional coarse grained sand and black rootlets.

BORING TERMINATED AT 31.5 FEET BELOW GRADE.

ALTON GEOSCIENCE
LOG OF EXPLORATORY BORING

PROJECT NO. 30-0248 DATE DRILLED 9/11/91
CLIENT BP Oil Co., Service Station No. 30-0248
LOCATION 4280 Foothill Blvd., Oakland, CA
LOGGED BY B. Nagle APPROVED BY _____

BORING NO. MW-9
WELL NO. MW-9

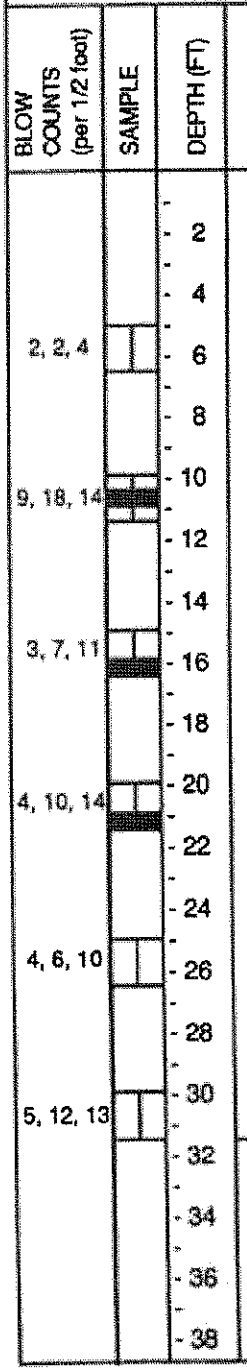
FIELD SKETCH OF BORING LOCATION

(SEE SITE PLAN)

TOP OF CASING ELEVATION _____

DRILLING METHOD C.M.E. 55, HSA HOLE DIAM. 8"
SAMPLER TYPE California Modified Split-Spoon Sampler
CASING DATA 2" diameter, Schedule 40 PVC, 20' blank, 10' slotted
DRILLER Soils Exploration

DEPTH TO WATER	14.12'	14.27'	14.18'
DATE	10/03/91	10/15/91	12/16/91
TIME	--	--	--



COMMENTS

3" Asphalt, 6" Concrete, 12" Road Base and Pea Gravel

SILTY CLAY: dark brown, damp, high plasticity, firm.

SANDY CLAY:dark brown, damp, firm, soft; fine to coarse grained sand.

SANDY GRAVEL: olive green to brown, damp, medium dense; with clay matrix.

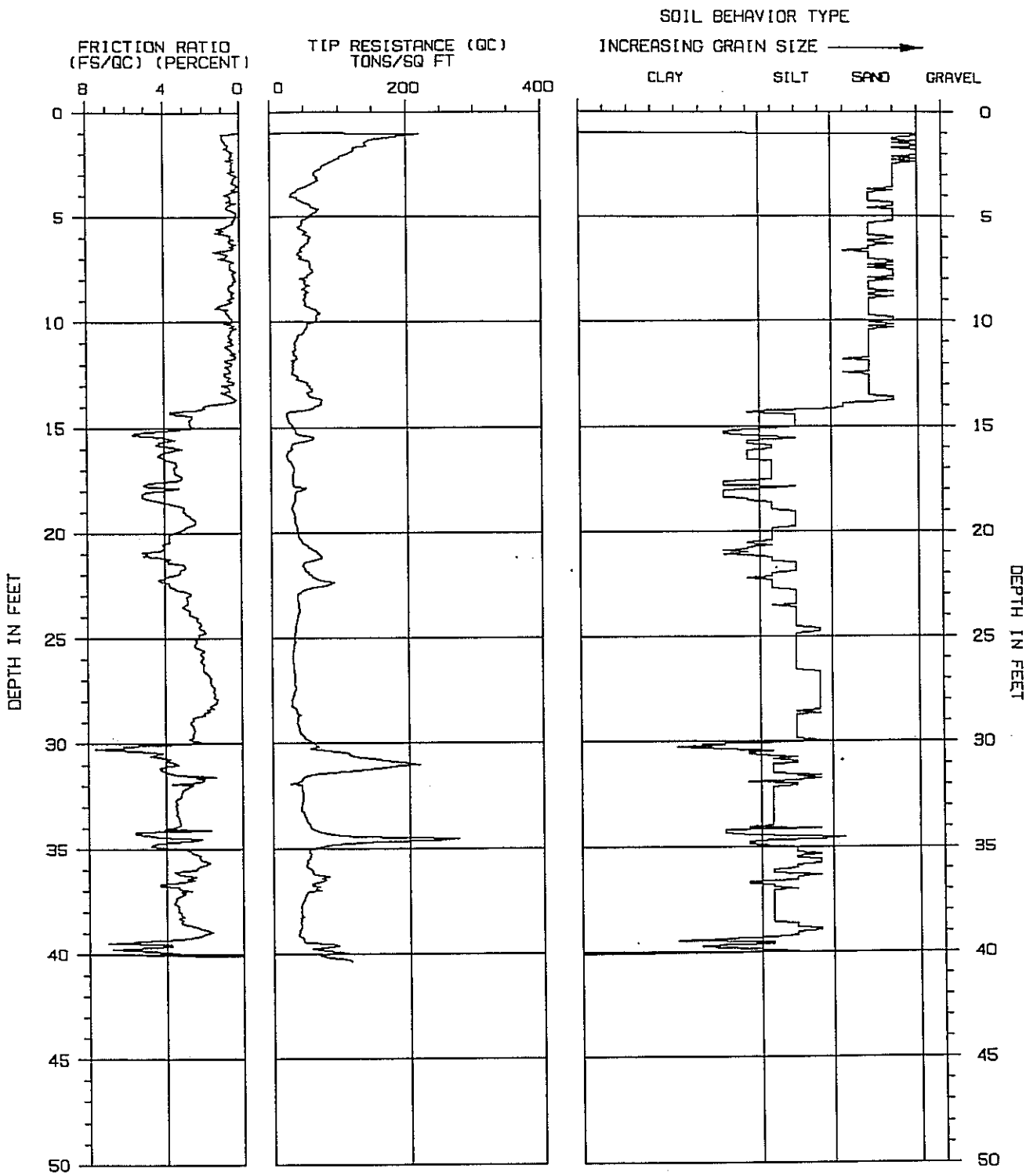
SANDY CLAY: brown, damp, stiff; with abundant gravel. No gravels at 16'.

SAME: very stiff,occasional carbonacious gravels.

SAME: stiff, with orangish brown mottling, SATURATED

SILTY CLAY: brown, damp, medium plasticity, very stiff; minor fine to coarse grained sand.

BORING TERMINATED AT 31.5 FEET BELOW GRADE.



TOP 1.0 FT IS DISTURBED SOIL

TIP RESISTANCE NOT CORRECTED FOR END AREA EFFECT

ASSUMED TOTAL UNIT WT = 115 PCF

ASSUMED DEPTH OF WATER TABLE = 42.0 FT

CONE PENETRATION TEST

SOUNDING NUMBER: 11109-SB1

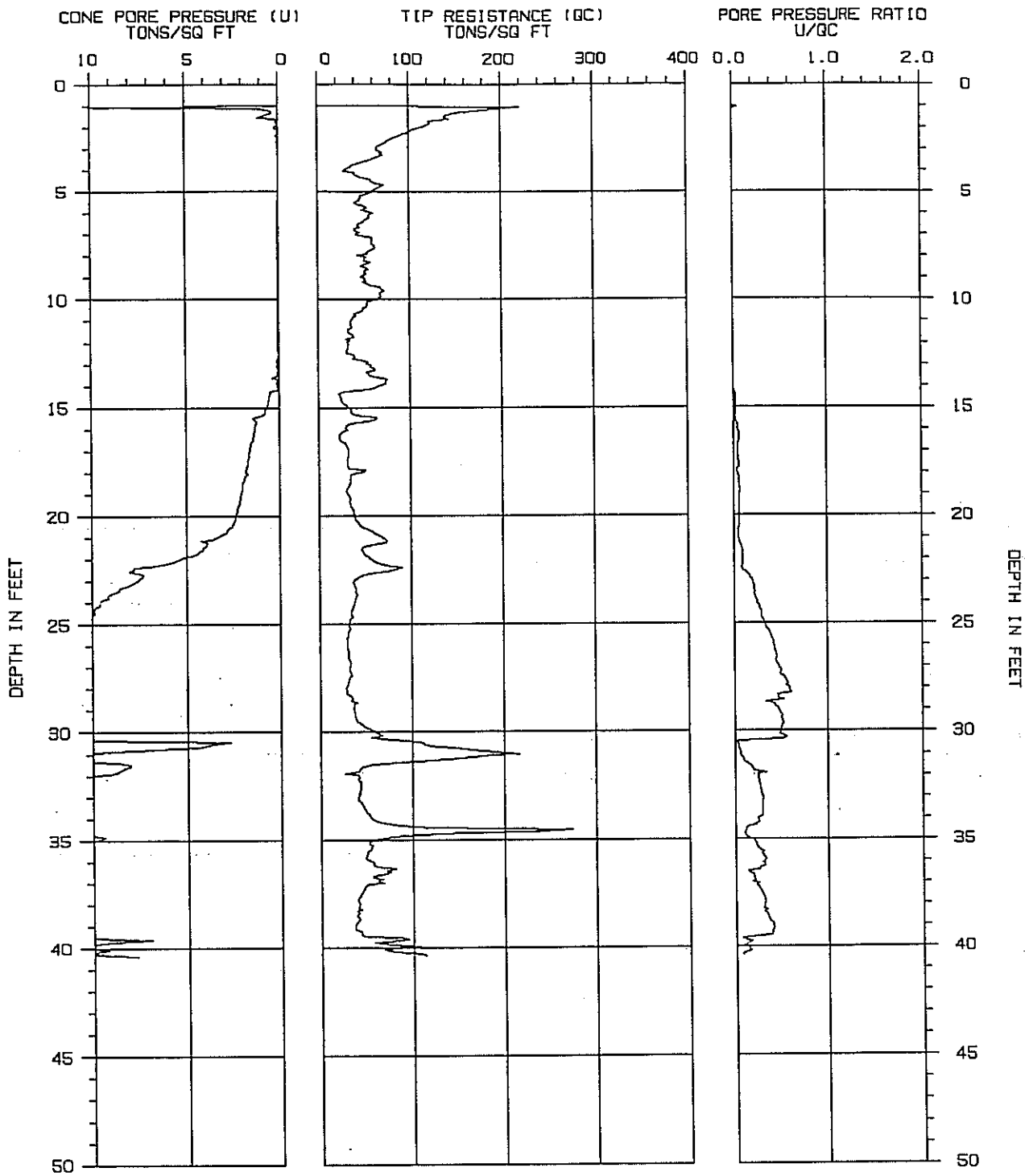
PROJECT NAME : EMCON/TOSCO

PROJECT NUMBER : 95-381-09301

CONE/RIG : 472/RIG#3

DATE/TIME: 10-19-94 12:07

THE EARTH TECHNOLOGY CORPORATION



TOP 1.0 FT IS DISTURBED SOIL

TIP RESISTANCE NOT CORRECTED FOR END AREA EFFECT

CONE PENETRATION TEST

SOUNDING NUMBER: 11109-SB1

PROJECT NAME : EMCON/TOSCO

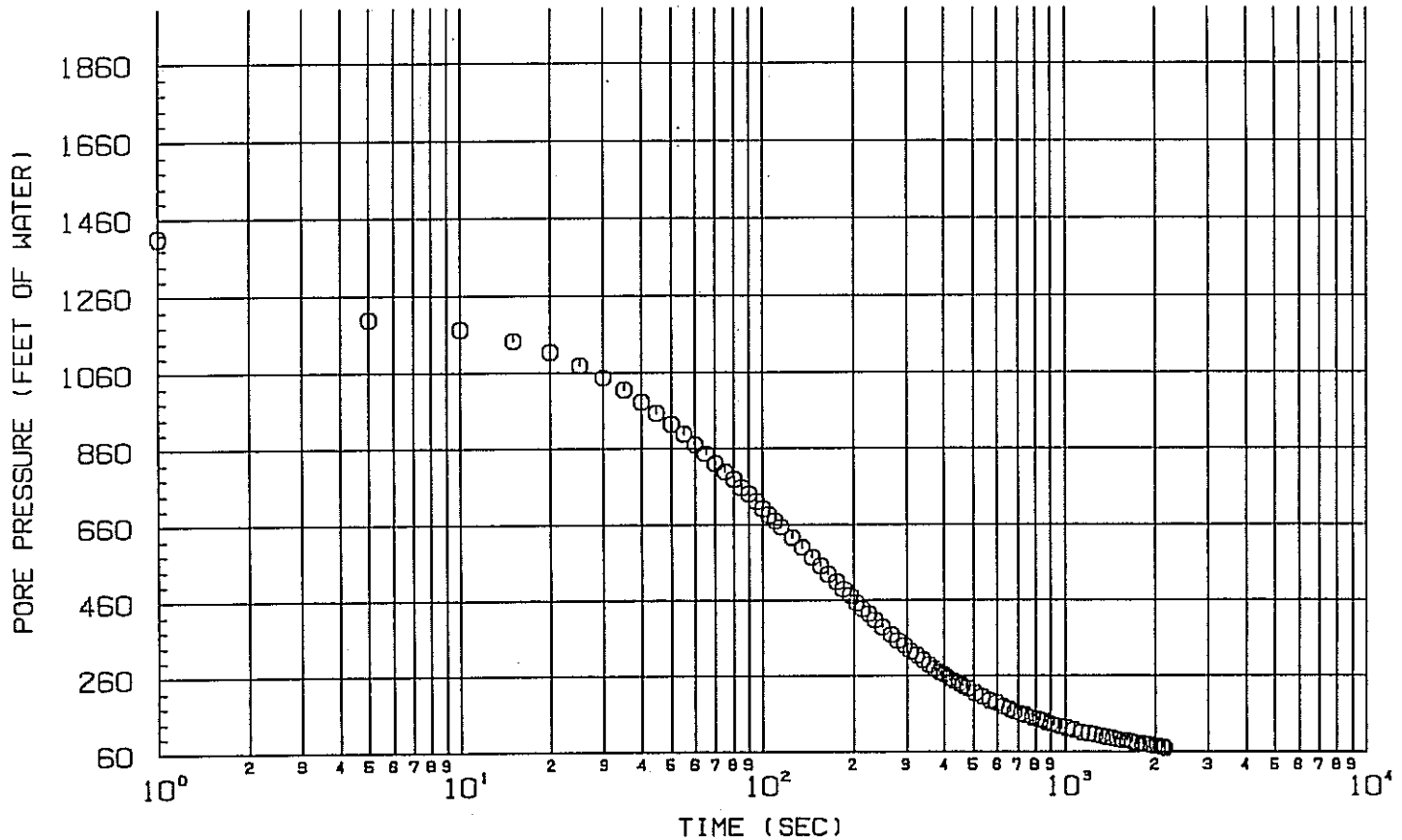
PROJECT NUMBER : 95-381-09301

CONE/RIG : 472/RIG#3

DATE/TIME: 10-19-94 12:07

THE EARTH TECHNOLOGY CORPORATION

PORE PRESSURE DISSIPATION CURVES



DEPTH: ⊙ 30.3 FT

TIP-SENSING PIEZOMETRIC CPT

SOUNDING NUMBER: 11109-SB1

PROJECT NAME : EMCON/TOSCO

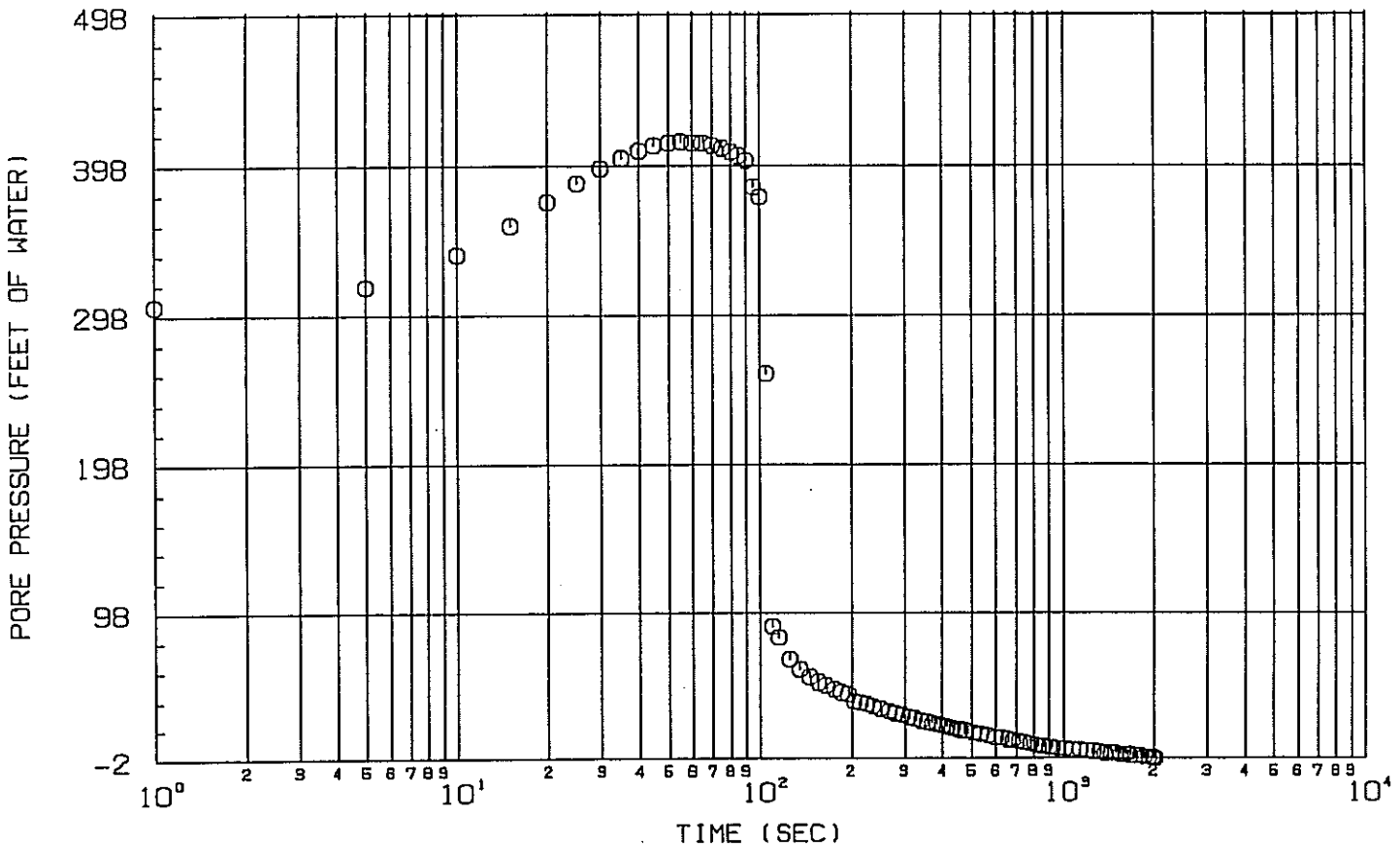
PROJECT NUMBER : 95-381-09301

CONE/RIG : 472/RIG#3

DATE/TIME: 10-19-94 12:07

THE EARTH TECHNOLOGY CORPORATION

PORE PRESSURE DISSIPATION CURVES



DEPTH: ⊙ 40.4 FT

TIP-SENSING PIEZOMETRIC CPT

SOUNDING NUMBER: 11109-SB1

PROJECT NAME : EMCON/TOSCO

PROJECT NUMBER : 95-381-09301

CONE/RIG : 472/RIG#3

DATE/TIME: 10-19-94 12:07

THE EARTH TECHNOLOGY CORPORATION

CONE PENETRATION TEST

SOUNDING : 11109-SB1
PROJECT : EMCON/TOSCO
DATE/TIME: 10-19-94 12:07

PROJECT No.: 95-381-09301
CONE/RIG : 472/RIG#3

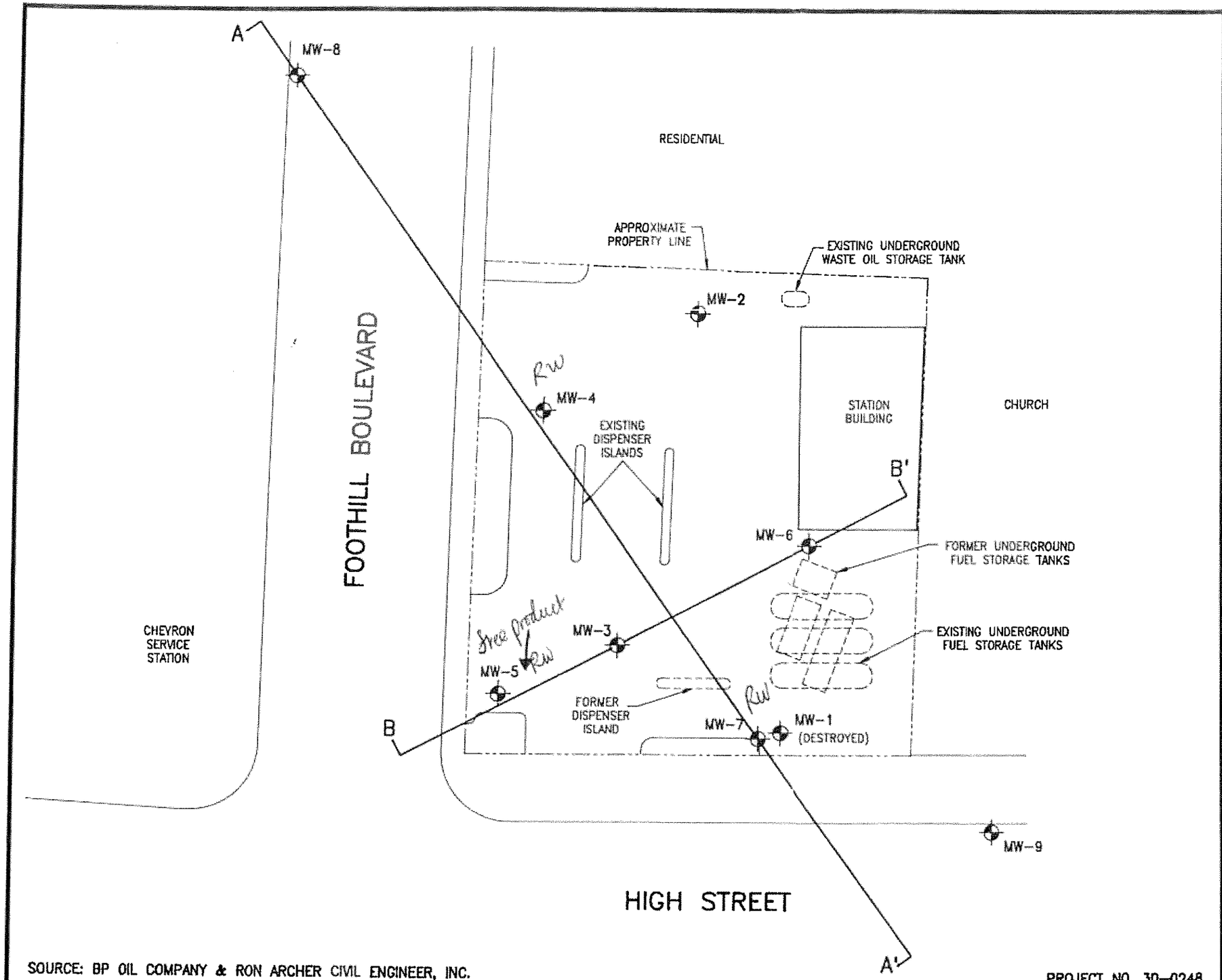
DEPTH (ft)	TIP RESISTANCE (tsf)	NORMALIZED TIP RESISTANCE (tsf)	FRICTION RATIO (%)	CONE PORE PRESSURE (tsf)	SOIL BEHAVIOR TYPE
.49	.0	.0	.00	.00	
.98	.0	.0	.00	.00	
1.48	137.8	285.4	.77	.84	SAND to SILTY SAND
1.97	117.8	229.3	.51	.16	SANDY GRAVEL to SAND
2.46	84.8	156.8	.43	.03	SAND to SILTY SAND
2.95	64.3	113.8	.44	-.04	SAND to SILTY SAND
3.44	62.1	105.8	.31	.01	SAND to SILTY SAND
3.94	30.6	50.4	.79	.02	SAND to SILTY SAND
4.43	58.3	92.9	.56	.02	SAND to SILTY SAND
4.92	58.6	90.8	.25	.03	SAND to SILTY SAND
5.41	45.0	67.9	.66	.03	SAND to SILTY SAND
5.91	54.1	79.5	.50	.03	SAND to SILTY SAND
6.40	49.1	70.5	.53	.03	SAND to SILTY SAND
6.89	46.4	65.1	.69	.03	SAND to SILTY SAND
7.38	58.4	80.1	.48	.03	SAND to SILTY SAND
7.87	53.9	72.4	.26	.03	SAND to SILTY SAND
8.37	51.3	67.7	.62	.04	SAND to SILTY SAND
8.86	51.5	66.6	.33	.04	SAND to SILTY SAND
9.35	59.4	75.4	1.29	.04	SAND to SILTY SAND
9.84	69.3	86.5	.50	.04	SAND to SILTY SAND
10.33	52.4	64.2	.25	.04	SAND to SILTY SAND
10.83	38.0	45.9	.44	.04	SAND to SILTY SAND
11.32	36.4	43.2	.54	.04	SAND to SILTY SAND
11.81	30.8	35.9	.83	.04	SILTY SAND to SANDY SILT
12.30	31.8	36.6	.58	.05	SAND to SILTY SAND
12.80	44.9	50.9	.74	.08	SAND to SILTY SAND
13.29	60.3	67.4	.54	.08	SAND to SILTY SAND
13.78	73.2	80.6	.32	.12	SAND to SILTY SAND
14.27	29.6	32.2	3.71	.47	SANDY SILT to CLAYEY SILT
14.76	27.0	28.9	2.70	.61	SANDY SILT to CLAYEY SILT
15.26	36.1	38.1	5.55	.79	*SANDY CLAY to SILTY CLAY
15.75	35.6	37.1	4.29	1.29	CLAYEY SILT to SILTY CLAY
16.24	22.7	23.4	4.21	1.40	CLAYEY SILT to SILTY CLAY
16.73	30.3	30.8	3.40	1.55	SANDY SILT to CLAYEY SILT
17.22	32.1	32.2	3.29	1.65	SANDY SILT to CLAYEY SILT
17.72	32.5	32.3	5.08	1.77	*SANDY CLAY to SILTY CLAY
18.21	34.7	34.0	5.19	1.88	*SANDY CLAY to SILTY CLAY
18.70	31.2	30.2	3.23	1.99	SANDY SILT to CLAYEY SILT
19.19	34.5	33.0	2.74	2.12	SANDY SILT to CLAYEY SILT
19.69	37.2	35.2	2.77	2.27	SANDY SILT to CLAYEY SILT
20.18	40.6	38.0	3.77	2.40	SANDY SILT to CLAYEY SILT

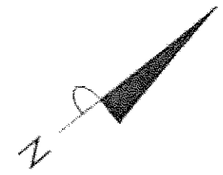
TOP 1.0 FT IS DISTURBED SOIL
*INDICATES OVERCONSOLIDATED OR CEMENTED MATERIAL
ASSUMED TOTAL UNIT WT = 115 PCF
ASSUMED DEPTH OF WATER TABLE = 42.0 FT

SOUNDING : 11109-SB1

DEPTH (ft)	TIP RESISTANCE (tsf)	NORMALIZED TIP RESISTANCE (tsf)	FRICTION RATIO (%)	CONE PORE PRESSURE (tsf)	SOIL BEHAVIOR TYPE
20.67	54.5	50.4	4.00	2.81	*CLAYEY SAND to SANDY CLAY
21.16	73.8	67.5	4.44	4.23	*SANDY CLAY to SILTY CLAY
21.65	47.7	43.1	2.93	4.29	SANDY SILT to CLAYEY SILT
22.15	61.3	54.9	3.96	5.77	*CLAYEY SAND to SANDY CLAY
22.64	62.0	54.9	3.51	7.62	SANDY SILT to CLAYEY SILT
23.13	37.9	33.2	2.91	7.85	SANDY SILT to CLAYEY SILT
23.62	41.2	35.7	2.91	9.01	SANDY SILT to CLAYEY SILT
24.11	37.3	32.0	2.34	9.60	SANDY SILT to CLAYEY SILT
24.61	35.5	30.1	2.06	10.20	SILTY SAND to SANDY SILT
25.10	31.3	26.3	2.49	10.39	SANDY SILT to CLAYEY SILT
25.59	30.9	25.7	1.99	12.16	SANDY SILT to CLAYEY SILT
26.08	30.1	24.8	2.18	13.13	SANDY SILT to CLAYEY SILT
26.57	32.0	26.1	2.03	14.60	SANDY SILT to CLAYEY SILT
27.07	33.0	26.7	1.64	15.89	SILTY SAND to SANDY SILT
27.56	31.9	25.5	1.50	17.35	SILTY SAND to SANDY SILT
28.05	28.9	22.9	1.34	17.00	SILTY SAND to SANDY SILT
28.54	34.1	26.8	2.03	17.82	SANDY SILT to CLAYEY SILT
29.04	37.1	28.8	2.73	17.94	SANDY SILT to CLAYEY SILT
29.53	41.4	31.9	2.58	21.41	SANDY SILT to CLAYEY SILT
30.02	61.7	47.1	2.91	30.43	SANDY SILT to CLAYEY SILT
30.51	112.3	84.9	4.39	3.27	*SANDY CLAY to SILTY CLAY
31.00	215.2	161.2	3.37	11.71	*CLAYEY SAND to SANDY CLAY
31.50	56.6	42.0	3.46	7.95	SANDY SILT to CLAYEY SILT
31.99	42.0	30.9	2.61	10.19	SANDY SILT to CLAYEY SILT
32.48	43.5	31.7	3.23	11.51	SANDY SILT to CLAYEY SILT
32.97	41.8	30.2	3.50	12.18	SANDY SILT to CLAYEY SILT
33.46	46.6	33.4	3.35	13.61	SANDY SILT to CLAYEY SILT
33.96	55.2	39.2	3.51	15.82	SANDY SILT to CLAYEY SILT
34.45	120.6	84.8	4.35	16.97	*CLAYEY SAND to SANDY CLAY
34.94	64.2	44.8	3.87	9.56	SANDY SILT to CLAYEY SILT
35.43	54.4	37.6	2.33	13.44	SANDY SILT to CLAYEY SILT
35.93	50.5	34.6	2.48	16.51	SANDY SILT to CLAYEY SILT
36.42	71.0	48.2	2.93	17.65	SANDY SILT to CLAYEY SILT
36.91	60.9	41.0	3.36	13.34	SANDY SILT to CLAYEY SILT
37.40	44.6	29.8	3.45	11.91	SANDY SILT to CLAYEY SILT
37.89	41.0	27.1	3.35	12.83	SANDY SILT to CLAYEY SILT
38.39	41.4	27.2	3.18	12.73	SANDY SILT to CLAYEY SILT
38.88	38.0	24.7	1.90	14.64	SILTY SAND to SANDY SILT
39.37	43.8	28.3	5.33	17.31	*SANDY CLAY to SILTY CLAY
39.86	77.3	49.4	4.76	10.12	*SANDY CLAY to SILTY CLAY

*INDICATES OVERCONSOLIDATED OR CEMENTED MATERIAL
ASSUMED TOTAL UNIT WT = 115 PCF
ASSUMED DEPTH OF WATER TABLE = 42.0 FT





APPROXIMATE SCALE IN FEET

LEGEND:

GROUND WATER MONITORING WELL

A A' LINE OF HYDROGEOLOGIC CROSS SECTION

SOURCE: BP OIL COMPANY & RON ARCHER CIVIL ENGINEER, INC.

PROJECT NO. 30-0248

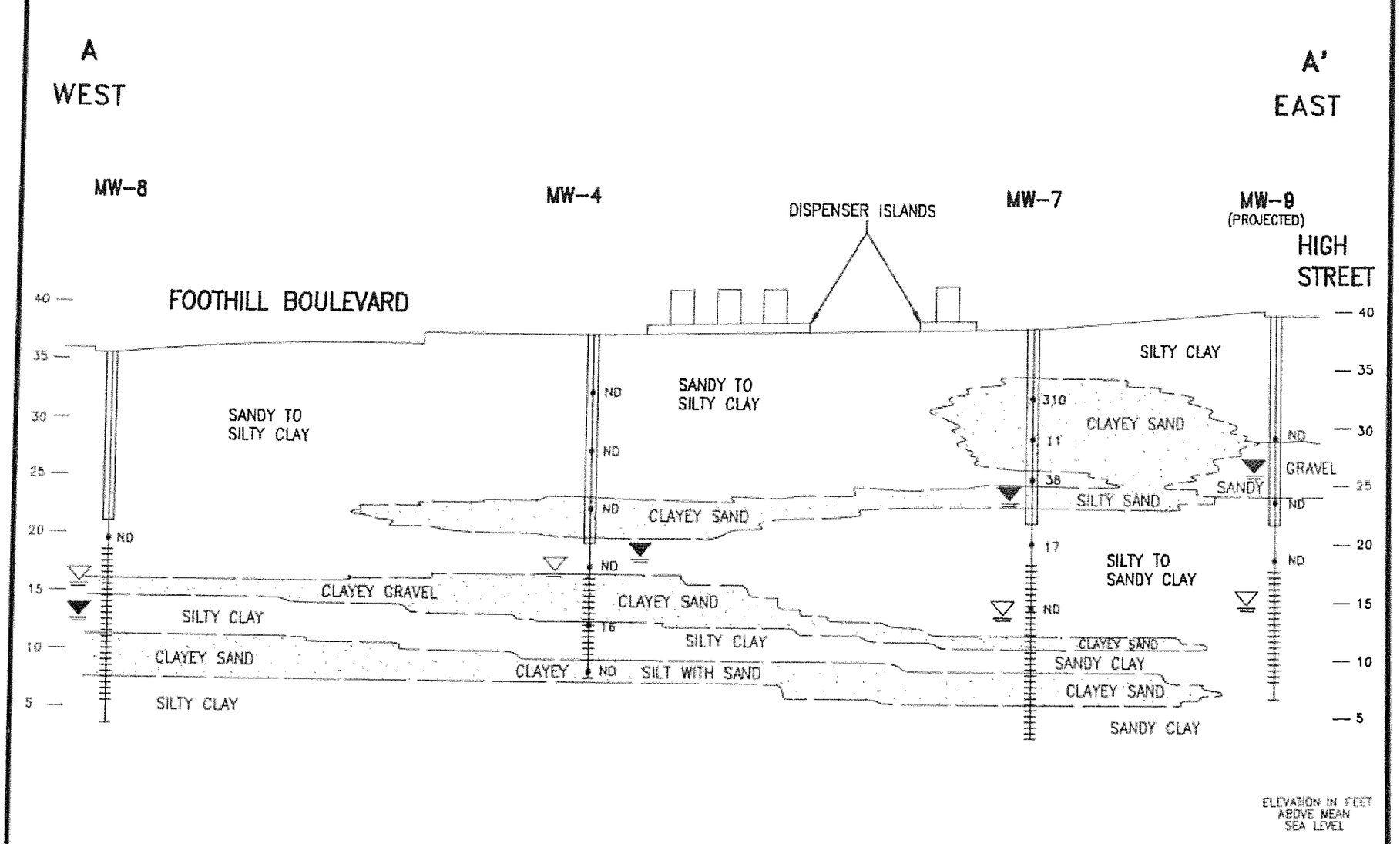
FIGURE 2: SITE PLAN

BP OIL COMPANY
SERVICE STATION NO. 11109
4280 FOOTHILL BOULEVARD
OAKLAND, CALIFORNIA

ALTON GEOSCIENCE
Pleasanton, California

248-SP

3/23/92



PROJECT NO. 30-0248

248-CSA

10
5
0
0 15 30
APPROXIMATE SCALE IN FEET

LEGEND:

- GROUND WATER MONITORING WELL SHOWING SEAL AND SLOTTING
- GEOLOGIC CONTACT
- WATER LEVEL ENCOUNTERED DURING DRILLING
- STABILIZED WATER LEVEL ON OCTOBER 3, 1991
- • 17 SOIL SAMPLE LOCATION AND TOTAL PETROLEUM HYDROCARBONS AS GASOLINE CONCENTRATIONS IN PARTS PER MILLION
- ND NOT DETECTED AT OR ABOVE LABORATORY DETECTION LIMITS

FIGURE 3: HYDROGEOLOGIC CROSS SECTION A-A'

BP OIL COMPANY
SERVICE STATION NO. 11109
4280 FOOTHILL BOULEVARD
OAKLAND, CALIFORNIA

ALTON GEOSCIENCE
1000 Burnett Ave. Ste. 140

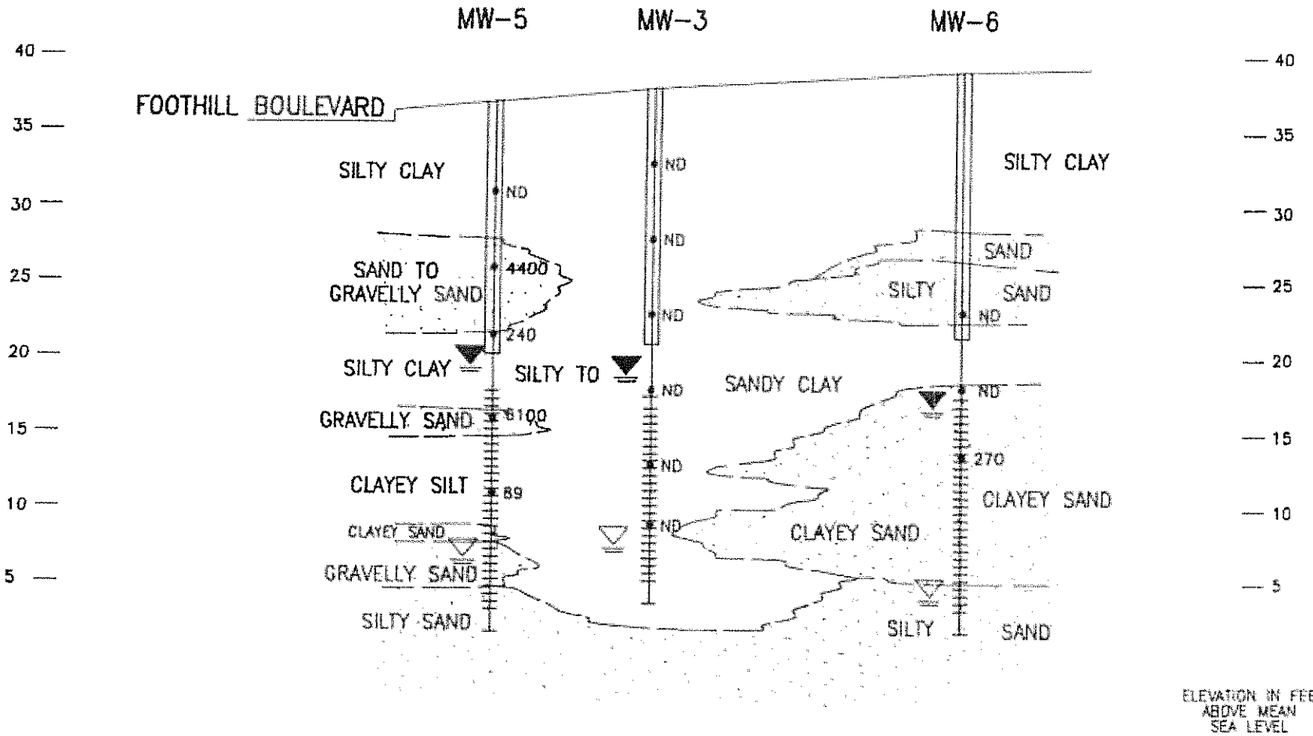
3/23/92

B

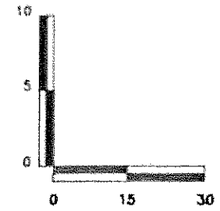
SOUTH

B'

NORTH



ELEVATION IN FEET ABOVE MEAN SEA LEVEL



APPROXIMATE SCALE IN FEET

LEGEND:

- GROUND WATER MONITORING WELL SHOWING SEAL AND SLOTTING
- GEOLOGIC CONTACT
- WATER LEVEL ENCOUNTERED DURING DRILLING
- STABILIZED WATER LEVEL ON OCTOBER 3, 1991
- • 270 SOIL SAMPLE LOCATION AND TOTAL PETROLEUM HYDROCARBONS AS GASOLINE CONCENTRATIONS IN PARTS PER MILLION
- ND NOT DETECTED AT OR ABOVE LABORATORY DETECTION LIMITS

FIGURE 4: HYDROGEOLOGIC CROSS SECTION B–B'

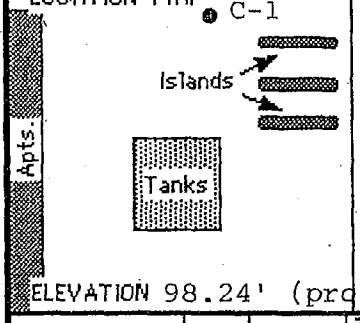
BP OIL COMPANY
SERVICE STATION NO. 11109
4280 FOOTHILL BOULEVARD
OAKLAND, CALIFORNIA

ALTON GEOSCIENCE
Pleasanton, California

PROJECT NO. 30-0248

248-CSB

3/23/92



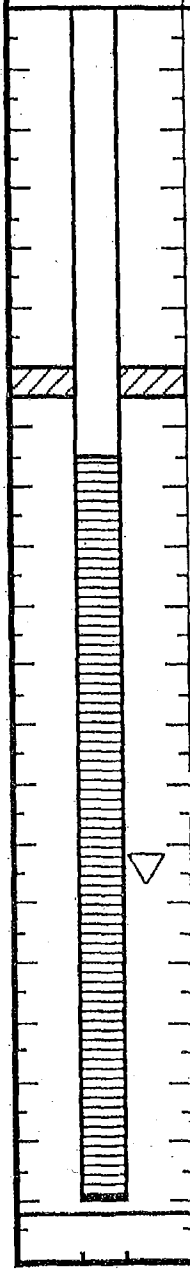
PACIFIC ENVIRONMENTAL GROUP, INC.

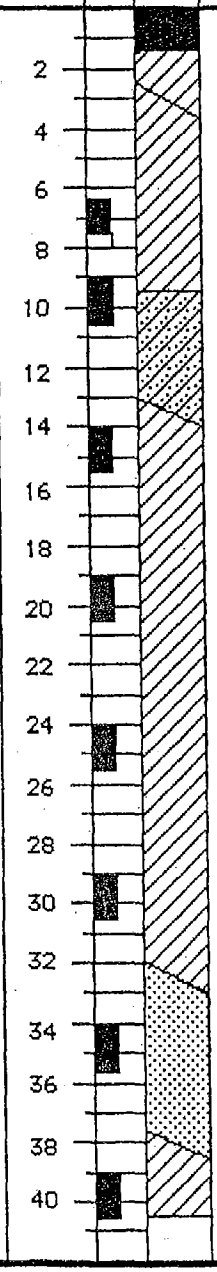
WELL / BORING NO. C-1
PAGE 1 OF 1

PROJECT NO. 120-57.01
LOGGED BY: E.G.
DRILLED BY: BAYLAND
DRILLING METHOD: HSA
SAMPLING METHOD: CAL. MOD.
CASING TYPE: SCH. 40 PVC
SLOT SIZE: 0.020
GRAVEL PACK: CA

CLIENT: G.R. CHEVRON USA
DATE DRILLED: 8-13-87
LOCATION: HIGH AND FOOTHILL
HOLE DIAMETER: 8"
HOLE DEPTH: 40-1/2'
WELL DEPTH: 40'
WELL DIAMETER: 3"

C-A attached at back of report





LITHOLOGY/REMARKS

ASPHALT AND BASEROCK.

CLAY; fill; black; silty; 0-10% fine to coarse sand; disturbed; soft; no product odor.

CLAY; olive; silty; 0-10%fine to medium sand; red to black; FeO stained.
@ 7': 20-30% fine to coarse sand; trace caliche; occasional pores; FeO mottled; stiff; trace fine to coarse gravel; no product odor.

CLAYEY SAND; yellowish brown; 15-25% fines; fine to coarse grained; 0-10% fine to coarse gravel; sub-rounded; no product odor.

CLAY; olive to strong brown; 10-20% fine to medium sand; trace coarse sand; FeO stains; very stiff; wet in root holes; no product odor.

@ 19': 20-30% fine sand intermittently; moderate plasticity; no product odor.

@ 24': 20-30% fine to coarse sand; trace fine gravel; very stiff; moderate plasticity; no product odor.

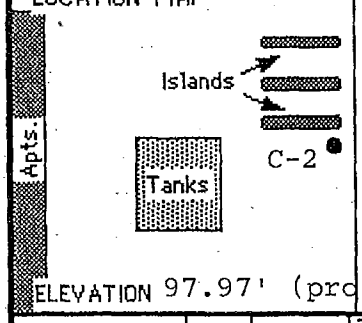
@ 29': light gray; 0-10% fine sand; moderate plasticity; caliche mottle; very stiff; no product odor.

SAND TO CLAYEY SAND; olive to brown; 5-20% fines; fine to coarse grained; 10-25% fine to medium gravel; very dense; faint product odor.

CLAY; strong brown; as above; 20-30% fine sand to coarse gravel; stiff; no product odor.

Bottom of boring at 40-1/2'

LOCATION MAP



ELEVATION 97.97' (project)

PACIFIC ENVIRONMENTAL GROUP, INC.

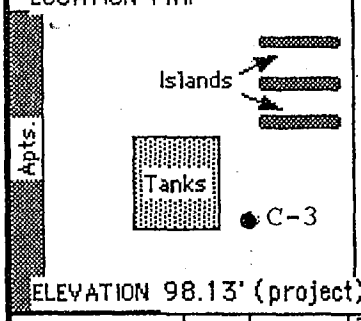
WELL / BORING NO. C-2
PAGE 1 OF 1

PROJECT NO. 120-57.01
LOGGED BY: E.G.
DRILLED BY: BAYLAND
DRILLING METHOD: HSA
SAMPLING METHOD: CAL. MOD.
CASING TYPE: SCH. 40 PVC
SLOT SIZE: 0.020
GRAVEL PACK: CA

CLIENT: G.R. CHEVRON USA
DATE DRILLED: 8-13-87
LOCATION: HIGH AND FOOTHILL
HOLE DIAMETER: 8"
HOLE DEPTH: 40-1/2'
WELL DEPTH: 40'
WELL DIAMETER: 3"

WELL COMPLETION	MOISTURE CONTENT	PENETRATION RESISTANCE (BLOW/FT)	DEPTH (feet)	SAMPLE	GRAPHIC	SOIL TYPE	LITHOLOGY/REMARKS
			0				ASPHALT AND BASEROCK.
			2			CL	CLAY FILL; black; abundant root fragments; silty; 0-10% fine sand; soft; faint product odor.
	Dp	22	4			CL	CLAY; gray;5-15% fine to coarse sand; moderate plasticity; silty; trace fine gravel; stiff; no product odor.
			6				
			8			CL-GC	CLAY TO CLAYEY GRAVEL; strong brown; 30-60% fine to coarse sand and gravel; FeO mottled; sub-rounded to sub-angular; very stiff; strong product odor.
	Dp-Mst	42	10				
			12				
			14			CL	CLAY; Yellowish brown; silty; moderate plasticity; occasional root fragments; FeO mottled; very stiff; 10-20% fine to medium sand; no product odor.
	Mst -Wt	50	16				
			18				
	Mst --Wt	not rec.	20				
			22				@ 24': contains up to 25% fine to coarse sand and fine gravel; faint product odor.
			24				
	Mst --Wt	70	26				
			28				@ 29': Strong product odor.
	Wt	42	30				
			32			SC	CLAYEY SAND; dark yellowish brown; 15-20% fines; fine to medium grained; medium dense; no product odor.
	Wt	24	34				
			36				
			38				CLAY; dark yellowish brown; 15-30% fine to coarse sand; silty; 10-15% fine to medium gravel; very stiff; no product odor.
	Wt	57	40			CL	
							Bottom of Boring at 40-1/2'

LOCATION MAP



ELEVATION 98.13' (project)

PACIFIC ENVIRONMENTAL GROUP, INC.

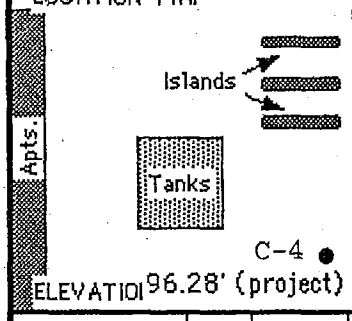
WELL / BORING NO. C-3
PAGE 1 OF 1

PROJECT NO. 120-57.01
LOGGED BY: E.G.
DRILLED BY: BAYLAND
DRILLING METHOD: HSA
SAMPLING METHOD: CAL. MOD.
CASING TYPE: SCH. 40 PVC
SLOT SIZE: 0.020
GRAVEL PACK: CA

CLIENT: G.R. CHEVRON USA
DATE DRILLED: 8-13-87
LOCATION: HIGH AND FOOTHILL
HOLE DIAMETER: 8"
HOLE DEPTH: 40-1/2'
WELL DEPTH: 40'
WELL DIAMETER: 3"

WELL COMPLETION	MOISTURE CONTENT	PENETRATION RESISTANCE (BLOW/FT)	DEPTH (feet)	SAMPLE	GRAPHIC	SOIL TYPE	LITHOLOGY/REMARKS
			0				ASPHALT AND BASEROCK.
			2			CL	CLAY FILL; olive to black; 0-10% fine sand; silty; soft; no product odor.
			4			CL	CLAY; olive; 5-10% fine to coarse sand; slightly silty; stiff; no product odor.
	Dp	P	6				
			8				
	Dp	79	10				@ 9': yellowish brown; 30-40% fine sand to medium gravel; stiff; faint product odor.
			12				
	Dp	36	14				@ 14': yellowish brown; 5-10% fine to medium sand; FeO mottled; trace root fragments; moderate plasticity; no product odor.
			16				
			18				
	Dp	38	20				@ 19': no product odor.
			22				
	Dp	46	24				@ 24': no product odor.
			26				
			28				
	Wt	59	30			GC	CLAYEY GRAVEL; yellowish brown; 20-30% fines; 20% fine to coarse sand; fine to coarse grained; FeO stained; very stiff; no product odor.
			32				
	Wt	25	34			CL	CLAY; olive to yellowish brown; moderate plasticity; FeO stained; 0-5% fine to coarse sand; very stiff; no product odor.
			36				
			38				
	Wt	70	40				Bottom of Boring at 40-1/2'

LOCATION MAP



PACIFIC ENVIRONMENTAL GROUP, INC.

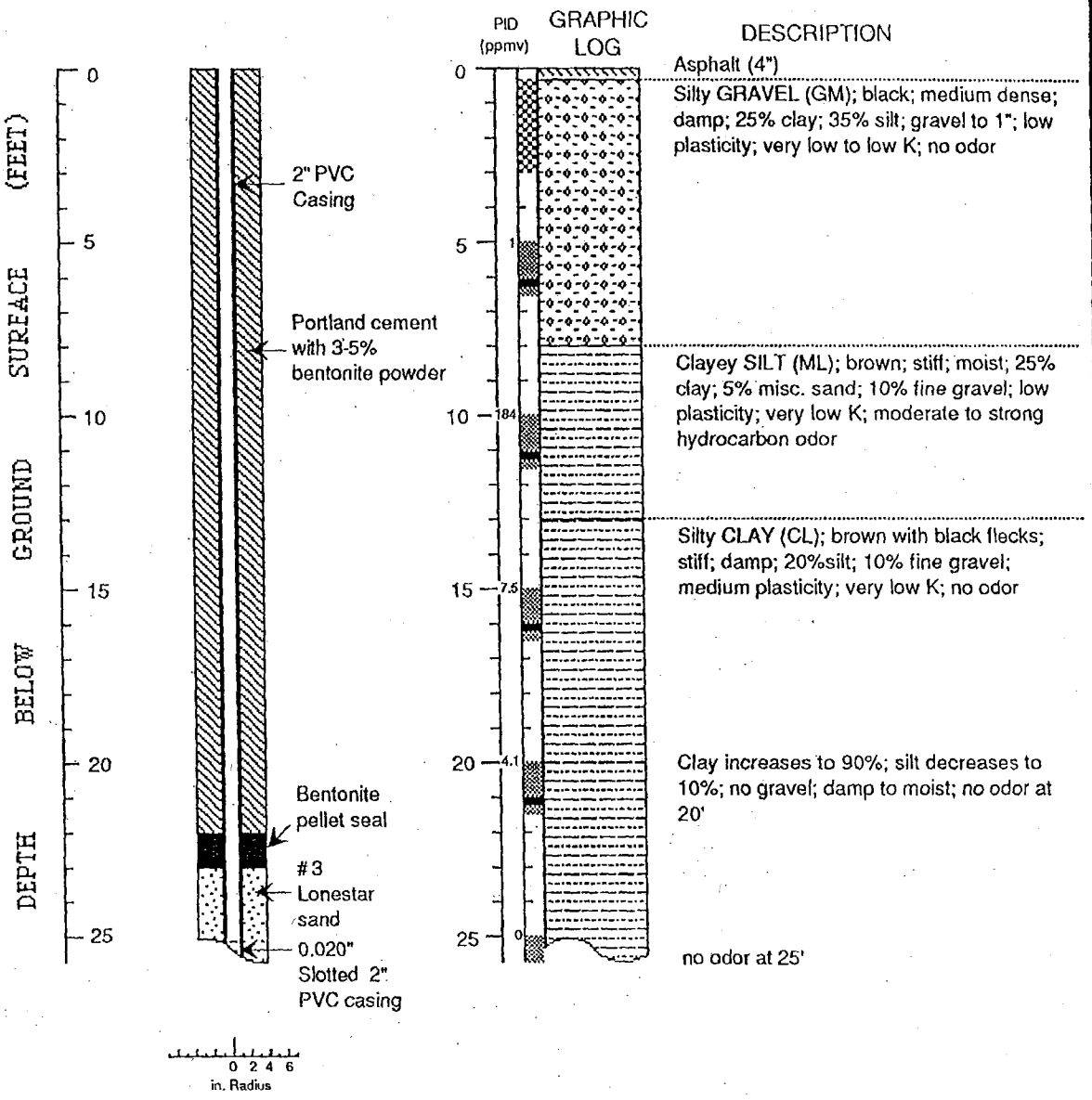
WELL / BORING NO. C-4
PAGE 1 OF 1

PROJECT NO. 120-57.01
LOGGED BY: E.G.
DRILLED BY: BAYLAND
DRILLING METHOD: HSA
SAMPLING METHOD: CAL. MOD.
CASING TYPE: SCH. 40 PVC
SLOT SIZE: 0.020
GRAVEL PACK: CA

CLIENT: G.R. CHEVRON USA
DATE DRILLED: 8-13-87
LOCATION: HIGH AND FOOTHILL
HOLE DIAMETER: 8"
HOLE DEPTH: 40-1/2'
WELL DEPTH: 40'
WELL DIAMETER: 3"

WELL COMPLETION	MOISTURE CONTENT	PENETRATION RESISTANCE (BLOW/FT)	DEPTH (feet)	SAMPLE	GRAPHIC	SOIL TYPE	LITHOLOGY/REMARKS
			2			CL	ASPHALT AND BASEROCK. CLAY; fill; black; silty; 0-10% fine sand; no product odor.
	Dp	P	4			CL	CLAY; olive; 5-10% fine to coarse sand; slighty silty; stiff; damp; no product odor.
	Dp	39	10			SC	CLAYEY SAND; yellowish brown; 20-40% fines; fine to medium grained; FeO stained; trace root fragments; hard; strong product odor.
	Dp	37	14			CL	CLAY; strong brown; slightly silty; moderate plasticity; 10-30% fine sand to medium gravel; hard; no product odor.
	Dp	49	20				@ 19': no product odor.
	Dp	N/A	24				@ 24': decrease sand; no product odor.
	Mst -Wt	41	30				@ 29': olive; 0-10% fine to medium sand; hard; no product odor.
	Mst -Wt	80	34				@ 34': yellowish brown; 20-25% fine to medium sand; silty; hard; no product odor.
	Mst -Wt	>32	40				@ 39': olive; 0-10% fine to medium sand; slightly silty; hard; no product odor. Bottom of Boring at 40-1/2'

Well C-5 (BH-E)



EXPLANATION

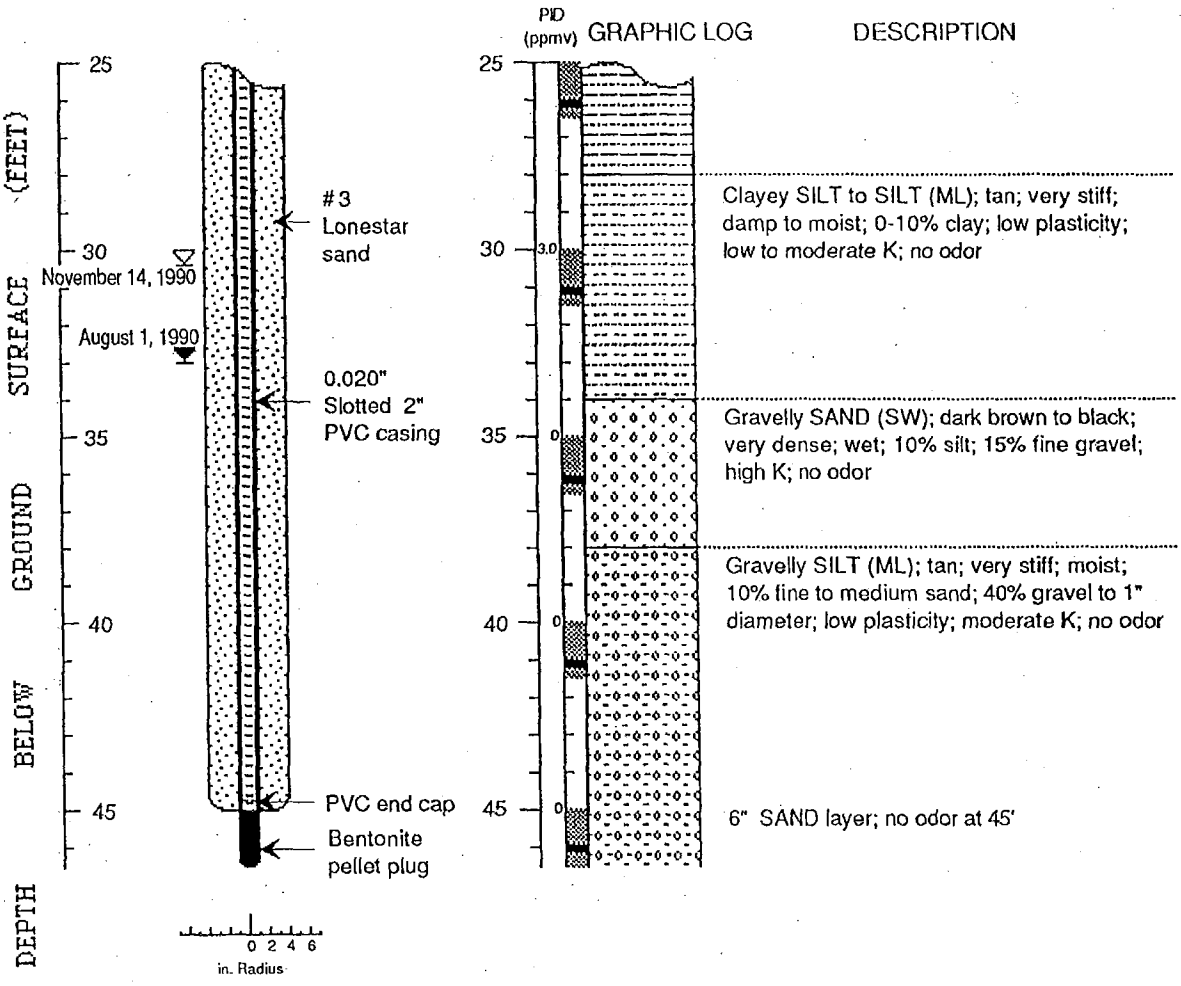
- Water level during drilling (date)
- Water level (date)
- Contact (dotted where approx.)
- Uncertain contact
- Location of recovered drive sample
- Location of drive sample sealed for chemical analysis
- Cutting sample
- K = Estimated hydraulic conductivity

Logged by:	Robert E. Kitay
Supervisor:	James W. Carmody; RG 4872
Drilling Company:	Soils Exploration Services, Vacaville, CA
Driller:	Russ Ellis
Drilling Method:	Hollow stem auger
Date Drilled:	August 1, 1990
Well Head Completion:	2" locking well-plug with traffic-rated vaul
Type of sampler:	Split barrel (2" ID)
Ground surface elevation:	35.83 feet above mean sea level

Well Construction and Boring Log Details - Well C-5 (BH-E)

Chevron Service Station #9-0076
Oakland, California

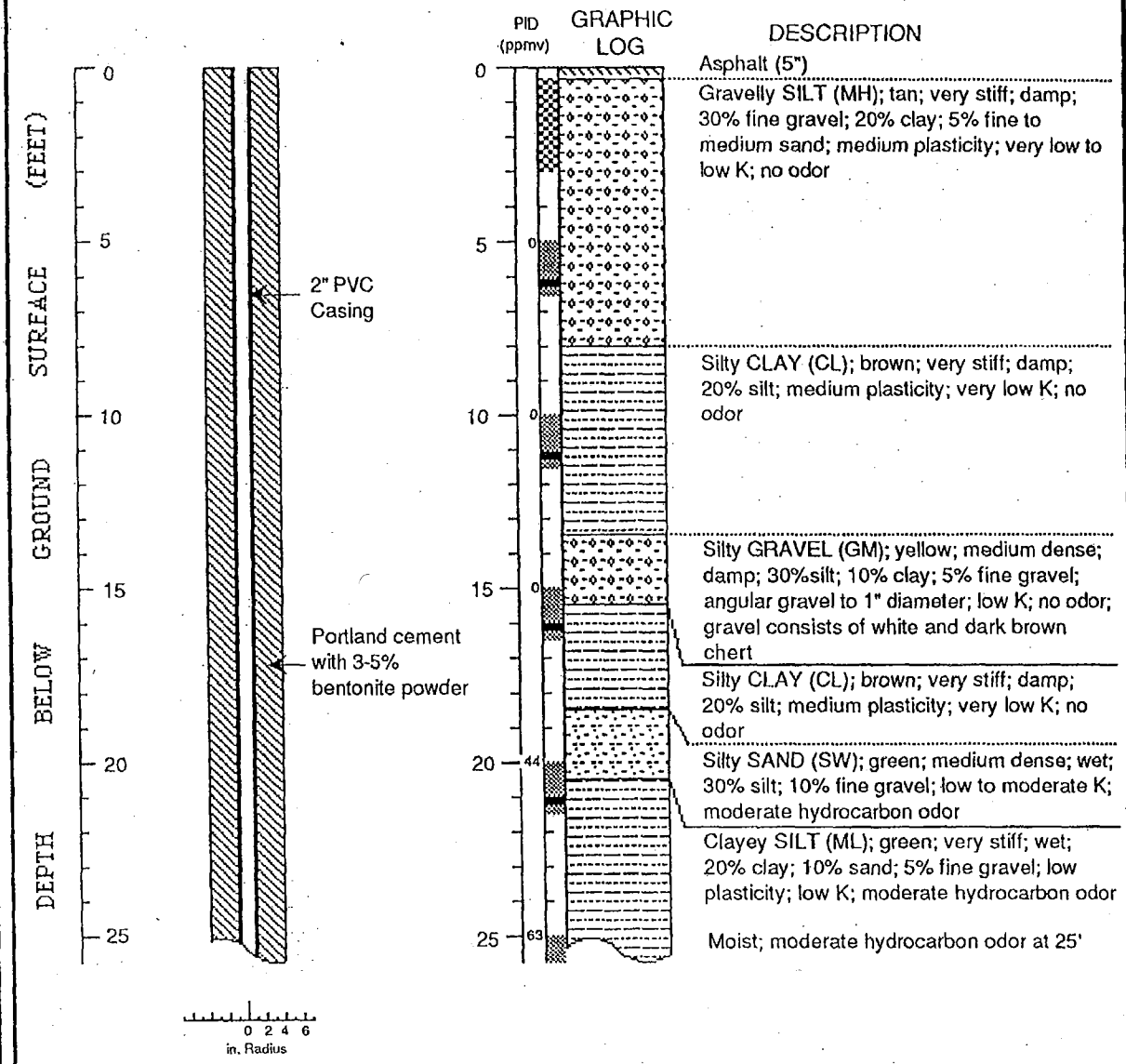
WELL C-5 (BH-E) (cont.)



Well Construction and Boring Log Details - Well C-5 (BH-E)

Chevron Service Station #9-0076
Oakland, California

Well C-6 (BH-F)



EXPLANATION

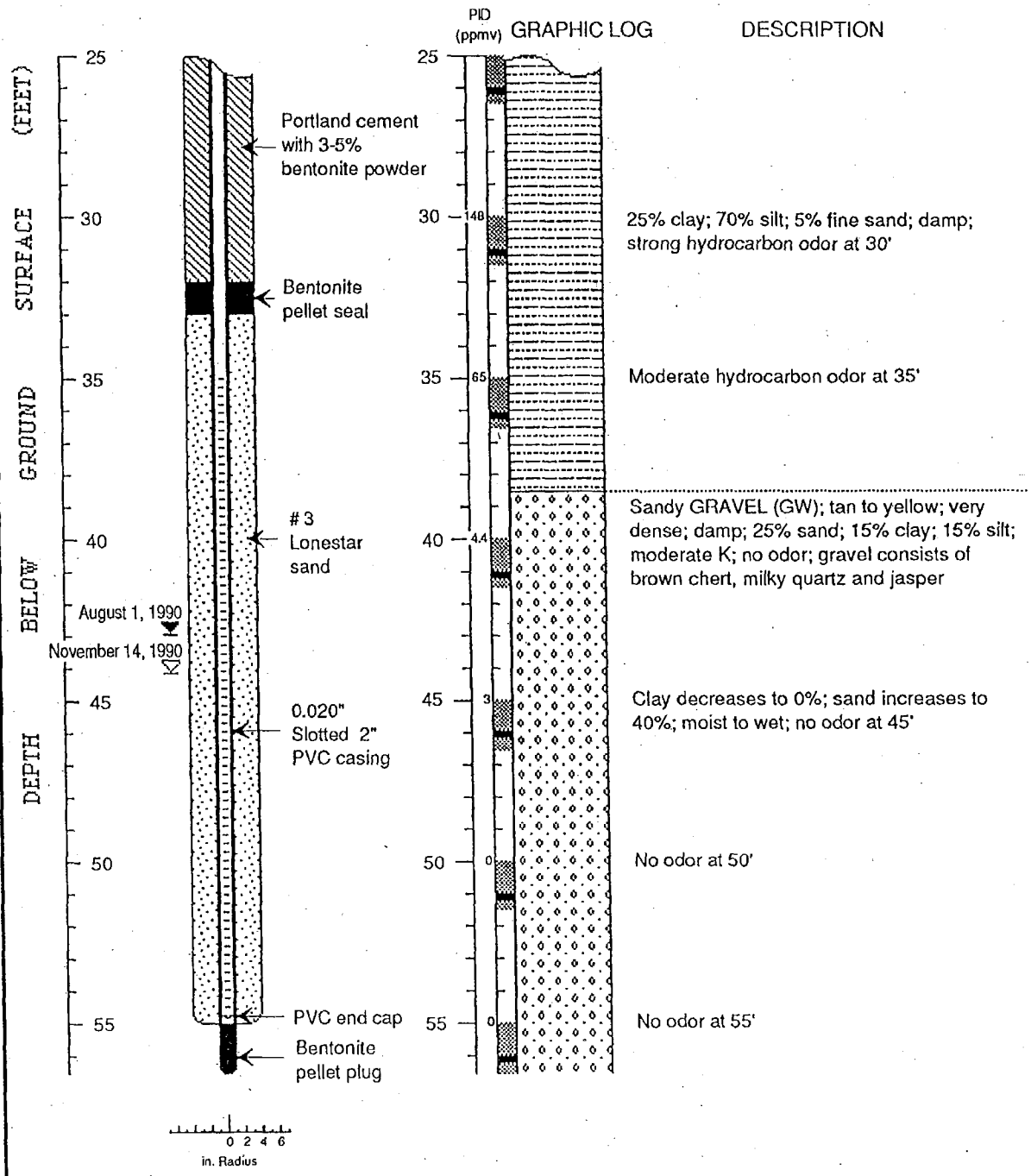
- Water level during drilling (date)
- Water level (date)
- Contact (dotted where approx.)
- Uncertain contact
- Location of recovered drive sample
- Location of drive sample sealed for chemical analysis
- Cutting sample
- K = Estimated hydraulic conductivity

Logged by:	Robert E. Kitay
Supervisor:	James W. Carmody; RG 4872
Drilling Company:	Soils Exploration Services, Vacaville, CA
Driller:	Russ Ellis
Drilling Method:	Hollow stem auger
Date Drilled:	August 1, 1990
Well Head Completion:	2" locking well-plug with traffic-ratted vault
Type of sampler:	Split barrel (2" ID)
Ground surface elevation:	

Well Construction and Boring Log Details - Well C-6 (BH-F)

Chevron Service Station #9-0076
Oakland, California

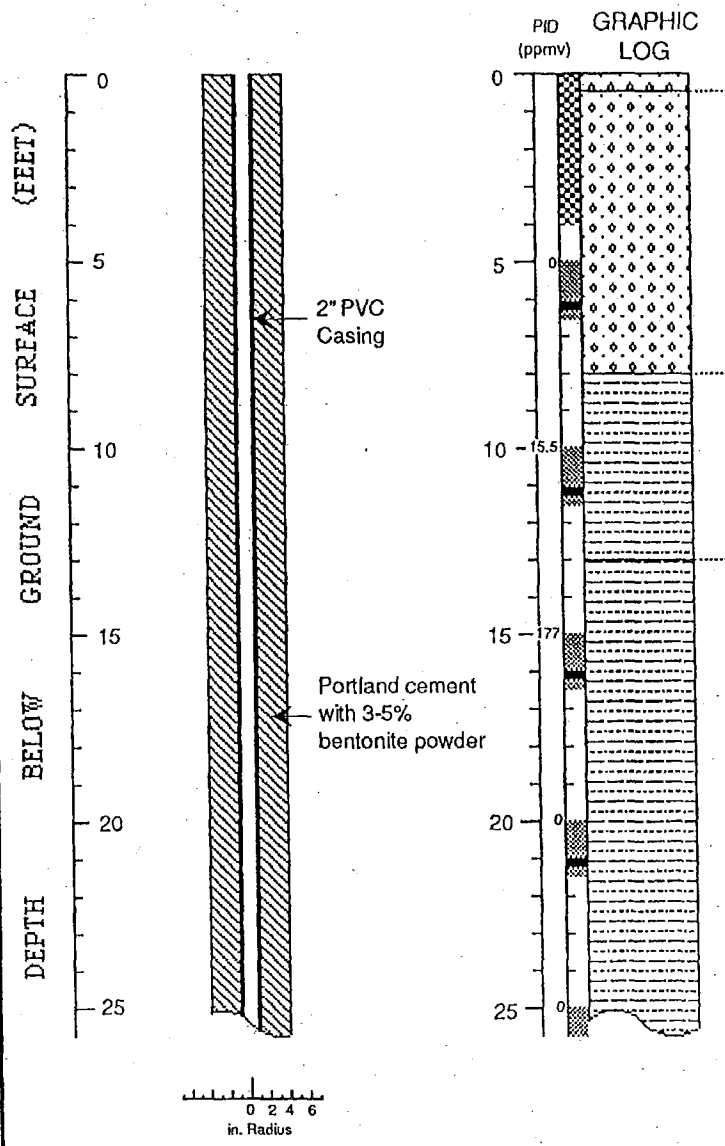
WELL C-6 (BH-F) (cont.)



Well Construction and Boring Log Details - Well C-6 (BH-F)

Chevron Service Station #9-0076
Oakland, California

Well C-7 (BH-G)



DESCRIPTION
Topsoil (6")
Sandy GRAVEL (GW); light brown mottled red-brown; medium dense; damp; 20% sand; 10% silt; gravel to 1" diameter; very high K; no odor; FeO staining
Clayey SILT (MH); olive; very stiff; damp; 10% clay; 5-10% fine sand; medium plasticity; low K; no odor
Silty CLAY (CL); brown; very stiff; damp to moist; 35% silt; 5% fine sand; medium plasticity; very low K; strong hydrocarbon odor
Wet; no odor at 20'
Clay increases to 85%; silt decreases to 10%; medium to high plasticity; no odor at 25'

EXPLANATION

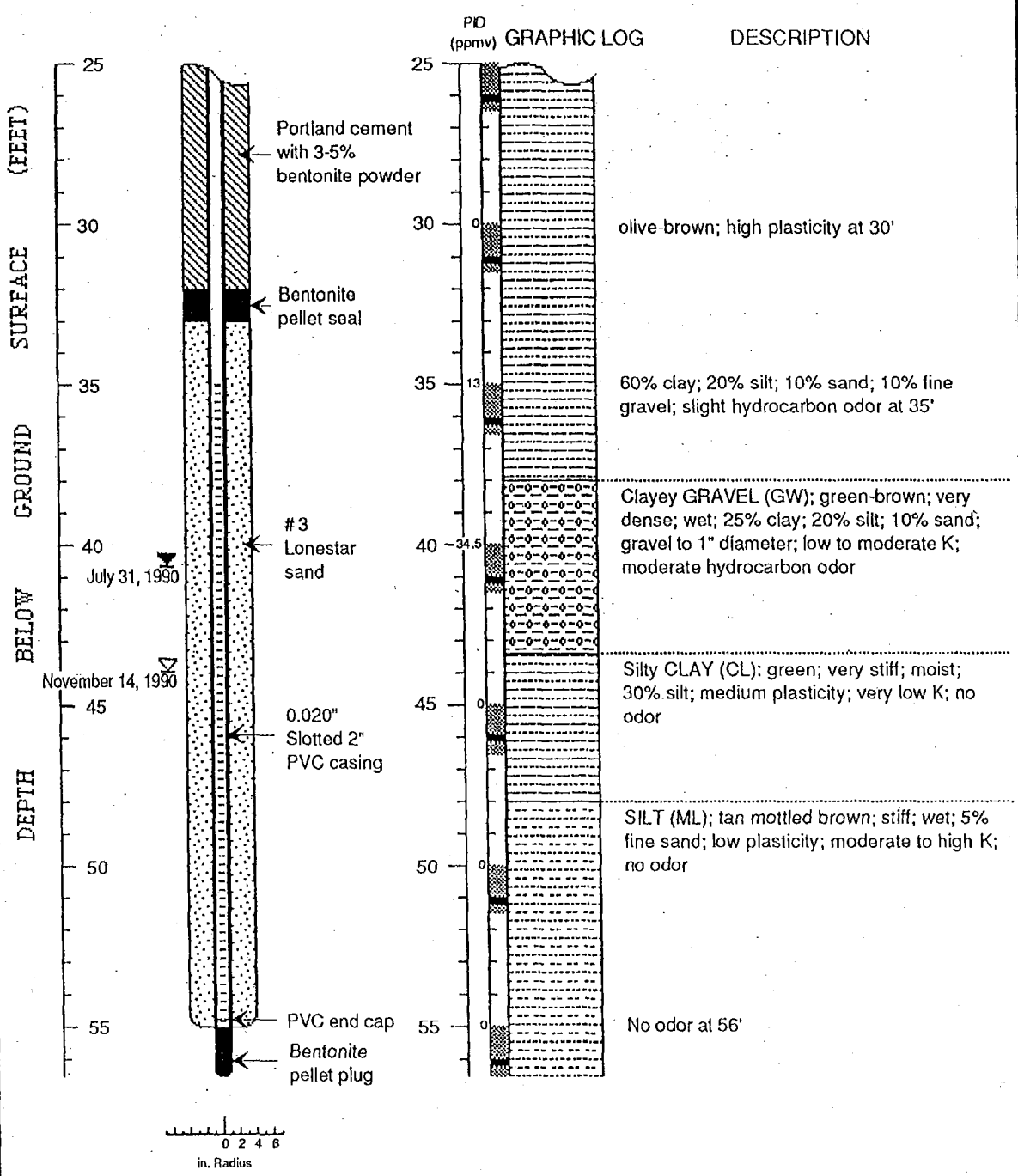
- Water level during drilling (date)
- Water level (date)
- Contact (dotted where approx.)
- Uncertain contact
- Location of recovered drive sample
- Location of drive sample sealed for chemical analysis
- Cutting sample
- K = Estimated hydraulic conductivity

Logged by:	Robert E. Kitay
Supervisor:	James W. Carmody; RG 4872
Drilling Company:	Soils Exploration Services, Vacaville, CA
Driller:	Russ Ellis
Drilling Method:	Hollow stem auger
Date Drilled:	July 31, 1990
Well Head Completion:	2" locking well-plug, stovepipe, traffic-ratted vault
Type of sampler:	Split barrel (2" ID)
Ground surface elevation:	32.65 feet above mean sea level

Well Construction and Boring Log Details - Well C-7 (BH-G)

Chevron Service Station #9-0076
Oakland, California

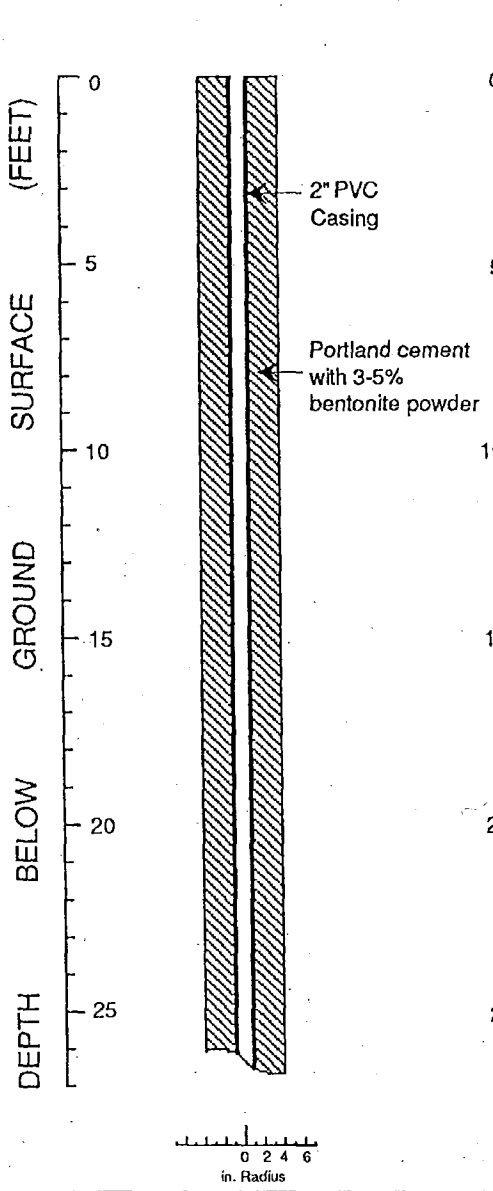
WELL C-7 (BH-G) (cont.)



Well Construction and Boring Log Details - Well C-7 (BH-G)

Chevron Service Station #9-0076
Oakland, California

WELL C-8 (BH-H)



PID (ppmv)	GRAPHIC LOG	DESCRIPTION
0		Asphalt
		SILT (ML); light tan-gray; medium stiff; dry to damp; 90 % silt; 5% fine to coarse sands; 5% clay; low K; no odor
5		Clayey SAND (SM/SC); yellow brown; stiff; dry to damp; 60% coarse sand; 20% clay; 20% silt; moderate K; no odor
		Sandy SILT (MH); olive-tan to white; stiff; dry; 60% silt; 30% fine sand; 10% clay; medium plasticity; low K; no odor
0		
10		Gravelly SAND (SW); brown-tan; medium dense; moist; 70% fine to coarse sand; 20% gravel to .5" diameter; 10% silt; high to very high K; no odor
0		Silty CLAY (CL); brown; stiff; damp; 50% clay; 25% silt; 20% fine sand; 5% gravel to .25" diameter; medium plasticity; very low K; no odor
15		
0		Silty CLAY (CL); brown-tan; very stiff; damp; 75% clay; 20% silt; 5% very fine sand; medium plasticity; very low K; no odor
0		
20		Silty SAND (SP); brown; loose; damp; 70% very fine sand; 30 % silt; moderate to high K; no odor
0		Silty CLAY (CL); gray-blue; stiff; damp; 50% clay; 45% silt; 5% very fine sand; medium plasticity; very low K; no odor
25		

EXPLANATION

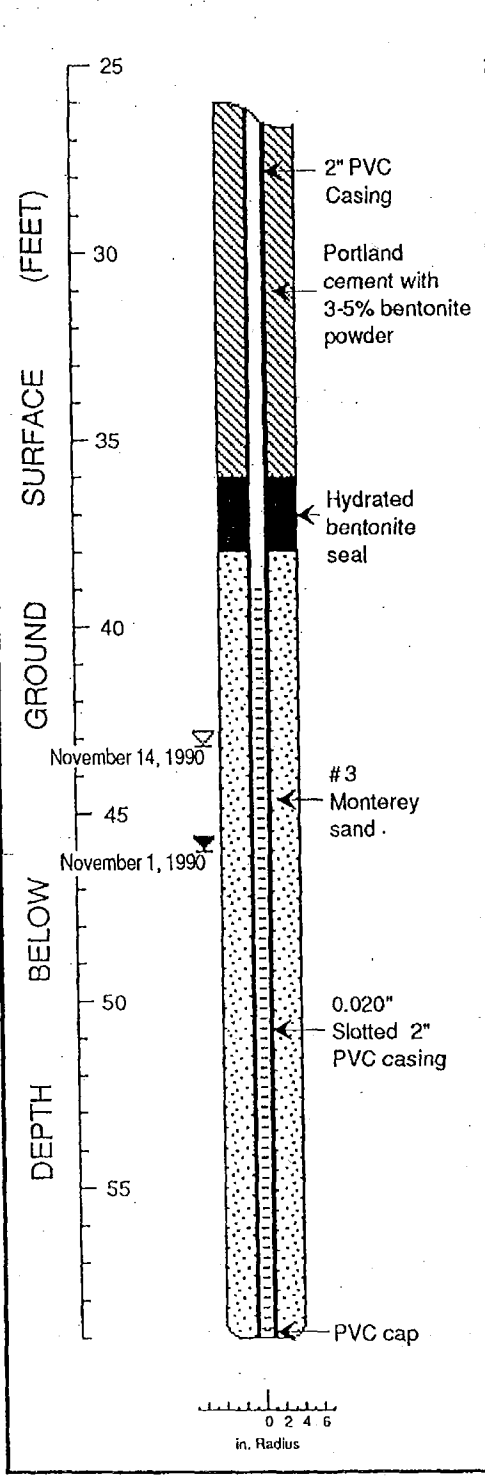
- Water level during drilling (date)
- Water level (date)
- Contact (dotted where approx.)
- Uncertain contact
- Gradational contact
- Location of recovered drive sample
- Location of drive sample sealed for chemical analysis
- Cutting sample
- K = Estimated hydraulic conductivity

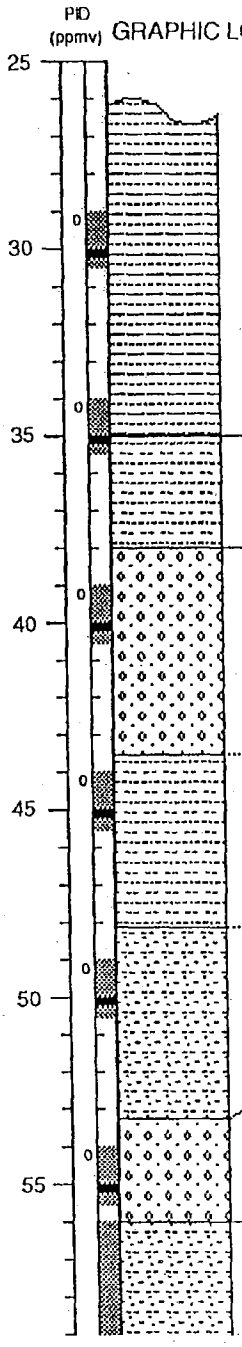
Logged by: Robert Kitay / Mariette Shin
Supervisor: James W. Carmody; RG 4872
Drilling Company: Soils Exploration Services, Vacaville, CA
Driller: Rick Carr
Drilling Method: Hollow-stem auger
Date Drilled: November 1, 1990
Well Head Completion: 2" locking well-plug; traffic rated vault
Type of Sampler: Split barrel (2" ID)
Ground Surface Elevation: 31.17 feet above mean sea level

Boring Log and Well Construction Details - Well C-8 (BH-H)

Chevron Service Station #9-0076
Oakland, California

WELL C-8 (BH-H) (cont.)





DESCRIPTION

Black streaks across sample at 34'

Sandy CLAY/Silty CLAY (CL); light-gray to white; stiff; moist; 50% clay; 30% sand; 20% silt; high plasticity; very low K; no odor (Contact-driller)

Gravelly SAND/ Silty SAND (SW); yellow-brown to orange; medium dense to dense; moist; 50% very fine to coarse sand; 20% gravel to .5" diameter; 20% silt; 10% clay; low to moderate K; no odor

SILT to Sandy SILT (ML); light brown mottled gray-green; medium stiff; 60-100% silt; 0-40% very fine sand; moderate K; no odor Wet at 46'

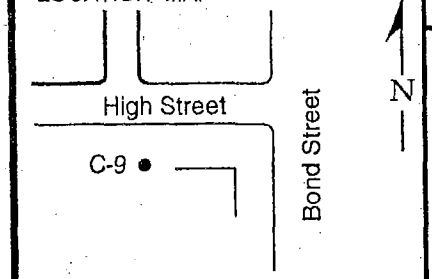
Silty SAND (SW); brown; dense; wet; 90% fine to coarse sand; 10% silt; high K; no odor

Gravelly SAND (SW); tan-brown; dense; very moist to wet; 60% very fine to coarse sand; 25% gravel to .75" diameter; 15% silt; high K ; no odor

Silty SAND (ML); tan-brown; damp to moist; medium dense to dense; 70% fine to coarse sand; 25% silt; 5% gravel to .3" diameter; moderate K; no odor

Boring Log and Well Construction Details - Well C-8 (BH-H)

Chevron Service Station #9-0076
Oakland, California

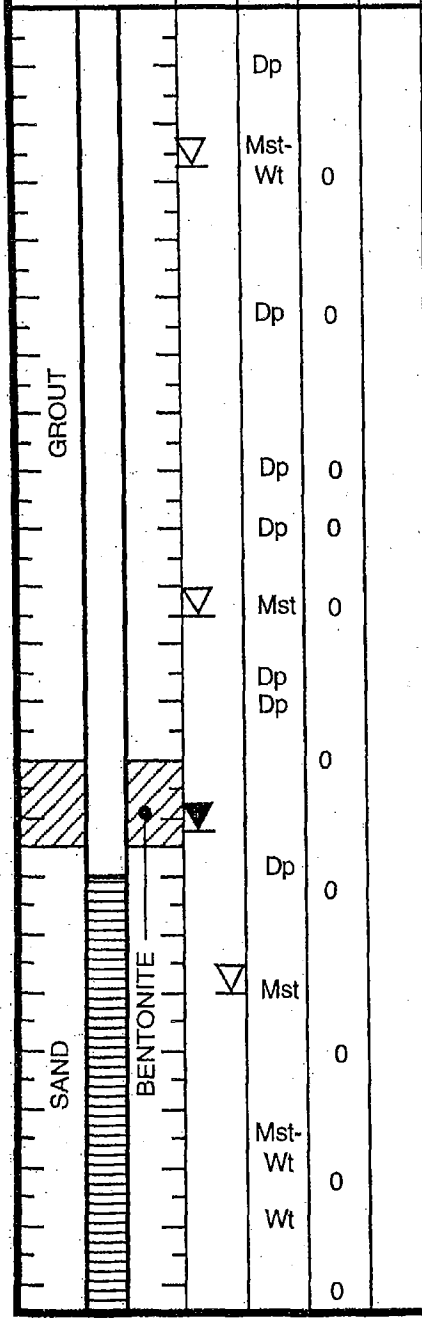


PACIFIC ENVIRONMENTAL GROUP, INC.

WELL NO. C-9
PAGE 1 OF 1

PROJECT NO. 325-024.1B
LOGGED BY: CWR
DRILLER: MDE
DRILLING METHOD: HSA
SAMPLING METHOD: CORE
CASING TYPE: SCH 40 PVC
SLOT SIZE: 0.020"
SAND PACK: #3 SAND

CLIENT: CHEVRON
DATE DRILLED: 7-10-96
LOCATION: 4265 Foothill Blvd.
HOLE DIAMETER: 8"
HOLE DEPTH: 45'
WELL DIAMETER: 2"
WELL DEPTH: 45'
CASING STICKUP: NA



MOISTURE CONTENT	PID	PENETRATION (BLOWS/FT)	DEPTH (FEET)	RECOVERY	SAMPLE INTERVAL	GRAPHIC	SOIL TYPE	LITHOLOGY / REMARKS
							GC	ASPHALT 4"
Dp			2				CL	CLAYEY GRAVEL - FILL: dark yellowish brown; 15-20% clay; 10% medium sand; 70-75% subangular gravel to 2" diameter; wood chips; no product odor.
Mst-Wt	0		4				CL	CLAY: dark yellowish brown; moderate plasticity; 90% clay with minor silt; 10% medium sand; no product odor.
			6					SANDY CLAY: dark yellowish brown; moderate plasticity; 60-70% clay; 30-40% coarse subangular sand to fine subangular gravel; no product odor.
			8					@10': as above; yellowish brown with pervasive gray and black mottling in thin horizontal bands; low to moderate plasticity; 60% clay; 20% silt; 20% medium sand; blocky fractures; manganese oxide streaks and specks; no product odor.
Dp	0		10					
			12					
			14				CL	SILTY CLAY: dark yellowish brown; moderate plasticity; 60% clay; 30% silt; 10% fine sand; manganese oxide specks; some fracturing; no product odor.
Dp	0		16					
Dp	0		18					@21': as above; yellowish brown with light gray mottling; moderate plasticity; trace manganese oxide specks; blocky fractures; no product odor.
Mst	0		20					SANDY CLAY: yellowish brown; pervasive orange brown and gray mottling; moderate plasticity; 60% clay; 10% silt; 30% fine sand; manganese oxide specks; some fracturing; no product odor.
Dp			22					
Dp			24				CL	
	0		26					@30': gray with yellowish brown; moderate plasticity; manganese oxide specks; 70% clay; 10% silt; 20% fine sand; trace fine gravel; extensive blocky fractures; no product odor.
			28					
Dp	0		30					@35': as above; yellowish brown with pervasive gray mottling in horizontal bands; low to moderate plasticity; 50% clay; 20% silt; 30% fine sand; trace white mudstone lithic fragments; no product odor.
			32					
Mst			34					CLAYEY SAND: yellowish brown; 30-40% clay; 20% silt; 40-50% fine sand; gray mottling; no product odor.
	0		36				SC	CLAYEY GRAVEL: yellowish brown; 20-30% clay; 20% medium to coarse sand; 50-60% subangular to subrounded gravel comprised of predominately weathered clastic and volcanic fragments; no product odor.
			38					
Mst-Wt	0		40				GC	GRAVEL: black, brown, and white; trace fines; 10% coarse sand; 85% subrounded to subangular gravel to 4" diameter; clastics and volcanic fragments; no product odor.
Wt			42				GW	
	0		44					BOTTOM OF BORING AT 45'

Cambria Environmental Technology, Inc.
5900 Hollis Street, Suite A
Emeryville, California 94608
Telephone: (510) 420-0700
Fax: (510) 420-9170

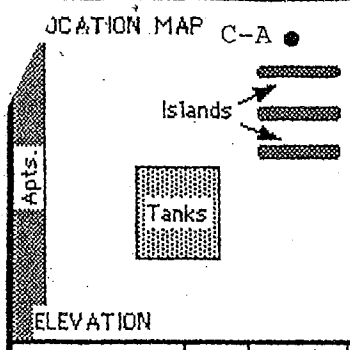
BORING/WELL LOG

CLIENT NAME	Chevron Products Company	**BORING/WELL NAME**	C-10
JOB/SITE NAME	9-0076	**DRILLING STARTED**	08-Aug-03
LOCATION	4265 Foothill Boulevard, Oakland CA	**DRILLING COMPLETED**	08-Aug-03
PROJECT NUMBER	41D-1977	**WELL DEVELOPMENT DATE (YIELD)**	09-Sep-03
DRILLER	Gregg Drilling	**GROUND SURFACE ELEVATION**	38.69 ft above msl
DRILLING METHOD	Hollow-stem auger	**TOP OF CASING ELEVATION**	38.37 ft above msl
BORING DIAMETER	8"	**SCREENED INTERVAL**	10 to 30 fbg
LOGGED BY	I. Robb	**DEPTH TO WATER (First Encountered)**	24.0 fbg (08-Aug-03) ▽
REVIEWED BY	B. Foss	**DEPTH TO WATER (Static)**	17.18 fbg (09-Sep-03) ▼

REMARKS Well installed with limited access drill rig (no blow counts available)

TPHg (mg/kg)	BLOW COUNTS	SAMPLE ID	EXTENT	DEPTH (fbg)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH (fbg)	WELL DIAGRAM
							Vac cleared to 8 fbg		Concrete
				5					Portland Type I/II
								8.0	Bentonite Seal
<50	NA	C-10@10'		10	SM		**Silty SAND with clay:** Light Brown; dry; 50% sand, 35% silt, 15% clay; low plasticity, low permeability.	9.0 10.5	Monterey Sand #2/16
<50	NA	C-10@15'		15	SM		**Silty Clayey SAND:** Light Brown; dry; 40% sand, 35% silt, 20% clay, 5% gravel; moderate plasticity, low permeability.	14.0 15.5	
							▼		
<50	NA	C-10@20'		20	SC		**Clayey Sandy SILT:** Light Brown; dry; 40% silt, 35% clay, 20% sand, 5% gravel; high plasticity, low permeability.	19.0 20.5	2"-diam., 0.010" Slotted Schedule 40 PVC
<50	NA	C-10@25'		25	SC		**Clayey Sandy SILT:** Light Brown; dry; 40% silt, 35% clay, 20% sand, 5% gravel; high plasticity, low permeability.	▽ 24.0 25.5	
<50	NA	C-10@30'		30	CL		**Silty CLAY:** Light Brown; dry; 65% clay, 35% silt; high plasticity, low permeability.	28.5 30.0	Bottom of Boring @ 30 fbg

WELL LOG (TPH-G) I:\9-0076 OAKLAND\9-0076 ADD'L INVESTIGATION FOR DIVESTMENT\9-0076.GPJ DEFAULT.GDT 10/8/03



PACIFIC ENVIRONMENTAL GROUP, INC.

WELL / BORING NO. C-A
PAGE 1 OF 1

PROJECT NO. 120-57.01
LOGGED BY: E.G.
DRILLED BY: BAYLAND
DRILLING METHOD: HSA
SAMPLING METHOD: CAL. MOD.
CASING TYPE: NA
SLOT SIZE:
GRAVEL PACK:

CLIENT: G.R. CHEVRON USA
DATE DRILLED: 8-13-87
LOCATION: HIGH AND FOOTHILL
HOLE DIAMETER: 8"
HOLE DEPTH: 40-1/2'
WELL DEPTH:
WELL DIAMETER:

WELL COMPLETION	MOISTURE CONTENT	PENETRATION RESISTANCE (BLOW/FT)	DEPTH (feet)	SAMPLE	GRAPHIC	SOIL TYPE	LITHOLOGY/REMARKS
Backfilled with Concrete	Dp	12	2			SC	ASPHALT AND BASEROCK.
		16	4				CLAYEY SAND; fill; dark olive; 20-30% fines; fine to coarse grained; trace fine gravel; medium dense; damp; faint product odor to strong product odor starting at 4'.
		11	6				@ 5-1/2': intermixed SW and GW fill materials; some free product; still primarily SC.
		4	8				@7': free product.
		9	10				@8-1/2': free product.
		10	12				@10': nearly saturated with product.
	Dp	50	14			SC/ GC	CLAYEY SAND and CLAYEY GRAVEL; interbedded; olive; 20-30% fines; silty; SAND; fine to coarse grained; 0-15% fine to medium gravel; very dense; faint product odor; GRAVEL; 15-25% fine to coarse sand; FeO mottled; fine to coarse grained; very dense; sub-rounded; damp; faint product odor.
		24	16				@16': strong product odor.
		28	18				
		18				CL	
	Mst	49	20				CLAY; strong brown; moderate plasticity; FeO mottled; slightly silty; stiff; 0-10% fine to medium sand; faint product odor.
			22				
		64	24				@23-1/2': faint product odor.
			26				Bottom of Boring at 25 feet.
			28				
			30				
			32				
			34				
			36				
			38				
			40				