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[redacted]

REPORT
LIMITED SUBSURFACE ENVIRONMENTAL INVESTIGATION

at

ARCO Station 4494
566 Hegenberger Road
Oakland, California

2/13/91

AGS 69038-2

Prepared for

ARCO Products Company
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For ARCO Products Company

INTRODUCTION

At the request of ARCO Products Company (ARCO), Applied GeoSystems conducted a subsurface investigation limited to the evaluation of petroleum hydrocarbons in the soil and ground water at ARCO Station 4494 located at 566 Hegenberger Road in Oakland, California. This subsurface investigation was initiated after petroleum hydrocarbons were reported by Pacific Environmental Group (Pacific) in the shallow subsurface soil during the removal of the waste-oil tank in December 1988 (Pacific, 1989). The present investigation included drilling five soil borings, installing 4-inch-diameter monitoring wells in four of the borings, performing laboratory analyses on selected soil samples obtained from the borings and water samples from the wells, surveying wellhead elevations, measuring ground-water levels in the wells, evaluating the local ground-water gradient, and performing a 1/2-mile radius well research around the site. This report summarizes previous work performed by others at the site, and presents our field procedures, findings, interpretations, and conclusions.

A description of the work performed for this investigation was included in Applied GeoSystems Work Plan (AGS, September, 1989), which was submitted for review and

approved by the Alameda County Department of Environmental Health (ACDEH). In addition to the borings proposed in the Work Plan, a fourth boring, B-4, was drilled in the southeastern corner of the site to further evaluate the depth to first ground water and the lateral extent of gasoline hydrocarbons discovered in the soil and ground water beneath the site during this investigation, and a fifth boring, B-5, was drilled adjacent to the former waste-oil tank pit excavation to further evaluate the extent of waste-oil hydrocarbons discovered in the soil beneath the site.

SITE DESCRIPTION AND BACKGROUND

General

The site is an operating gasoline station at 566 Hegenberger Road on the northeastern corner of the intersection of Hegenberger Road and Edes Avenue in Oakland, California. The site location is shown on the Site Vicinity Map (Plate 1). The site is on a relatively flat lot at an elevation of approximately 5 feet above mean sea level. The site is situated in a commercial/industrial area of the City of Oakland, approximately 1,000 feet east of Interstate Highway 880. This commercial/industrial area is occupied by a wide variety of businesses including fast food restaurants, the Oakland SPCA, union halls, tool manufacturers, trucking firms, construction firms, sign painting firms, motels, and inns. The Oakland-Alameda County Coliseum complex is located approximately 1/2-mile northwest of the site. The site is bounded by a restaurant to the north, a parking lot for a restaurant to the east, restaurants to the west across Hegenberger Road, and a Shell Oil service station across Edes Avenue to the south.

Before its development, the subject property was covered by a sparse growth of native grasses and weeds, and was situated on reclaimed tidal marshlands covered by approximately

four feet of artificial fill (Soil Mechanics and Foundation Engineers (SMFE), 1968). The fill material was described by SMFE as heterogeneous sandy gravelly clay containing construction debris, including pieces of concrete, asphalt, and metallic slag. The source of the construction debris was unknown. Below the fill material was marshland soil and bay mud deposits. SMFE reported that the site may contain a buried tidal slough crossing the southern portion of the site. This slough was filled in between 1947 and 1953, based on observations of aerial photographs from those years, and replaced with an excavated drainage channel (Pacific Aerial Surveys, 1947 and 1953). This drainage channel was then filled in and replaced with a 72-inch storm drain pipeline sometime after 1968. The buried channel is approximately located on the Generalized Site Plan (Plate 2) from information provided by the City of Oakland. Three sewer lines were reported by SMFE in 1968 to cross the central portion of the property in a northeast-southwest direction, including the 72-inch-diameter storm drain, a 48-inch-diameter sanitary sewer, and a 39-inch-diameter abandoned sanitary sewer pipeline. Approximate locations of the storm drain and sewer lines based on plans supplied by the City of Oakland Public Works are shown on Plate 2.

We understand from microfiche plans at the City of Oakland Building Inspection Department (OBID) that the site was originally developed by Gulf Oil Corporation (Gulf) as a service station in 1969. Building plans for the Gulf Oil station show three underground storage tanks (USTs) east of the station building, and a fourth tank (possibly a waste-oil tank) may have been located adjacent to the east wall of the station building just south of the USTs. Records of the Oakland Fire Department indicate that Gulf removed and replaced one 10,000-gallon underground storage tank (UST) in 1975. No record of soil sampling to document possible leakage from the tank(s) was found.

ARCO purchased the site from Gulf in 1977. It is our understanding, from information supplied by ARCO, that one 280-gallon waste-oil storage tank was located west of the

station building. On December 16, 1988, the 280-gallon waste-oil storage tank was excavated and removed from the site by Crosby and Overton (C&O) of Oakland, California. It is our understanding that three 10,000-gallon underground gasoline-storage tanks are at the site: one regular gasoline-storage tank, one super-unleaded gasoline-storage tank, and one regular-unleaded gasoline-storage tank. It is also our understanding that ARCO plans to remodel the site and replace the existing gasoline-storage tanks in 1991.

Geology

The site is located along the eastern margin of San Francisco Bay within the East Bay Plain, in the northwestern portion of the San Leandro Cone near the boundary of the Oakland Alluvial Plain (Hickenbottom, 1988). The East Bay Plain lies within the Coast Range geomorphic province and is characterized by broad alluvial fan margins sloping westward into San Francisco Bay.

The site area formerly was occupied by shallow tidal marshes, and a channelized tidal slough is still located directly across Hegenberger Road from the site. Helley, et. al. (1979) mapped the earth materials underlying the site area as Holocene-age bay mud estaurine deposits composed of unconsolidated, water-saturated, dark plastic clay and silty clay rich in organic materials, with local lenses and stringers of well-sorted silt, fine sand, and peat. These estaurine materials, known locally as Bay Mud, were deposited primarily in brackish- to salt-water marshes along the margins and beneath the waters of San Francisco Bay during interglacial periods before and after the Wisconsin Glaciation in late Pleistocene time (Goldman, 1969). The estuarine Bay Mud materials interfinger with Holocene-age fine-grained alluvium deposited by standing floodwaters that periodically inundate the low interfluvial basin areas and fresh-water marshes (Helley, et al., 1979).

Hydrogeology

Alameda County uses ground water as part of its domestic water supply. The remainder of the water supply is derived from surface reservoirs and from imported water that is transported in from the Mokelumne Aqueduct, the State Water Project, and the Hetch Hetchy Aqueduct (Hickenbottom, 1988).

Ground-water quality in the water-bearing units of the San Leandro Cone is generally good (meets recommended primary and secondary standards for drinking water). The most productive water wells in the San Leandro Cone are those completed within the older alluvium units. The older alluvium units consist of permeable alluvial fan deposits characterized by poorly consolidated to unconsolidated gravel, sand, silt and clay (Hickenbottom, 1988). These units contain appreciable quantities of ground water, and are therefore considered to be the principal ground-water reservoir in the East Bay Plain area. Smaller amounts of ground water occur in the younger alluvium, fluvial deposits, interfluvial basin deposits, and Bay Mud estaurine deposits. These deposits generally are relatively thin (less than 120 feet thick), and generally yield only small amounts of ground water to wells. The Bay Mud unit is important to the ground-water resources of the East Bay Plain because of the low permeability of the Bay Mud functions as a barrier to the vertical movement of salt water from San Francisco Bay into the older alluvium. The Bay Mud is generally water-saturated because most of it lies below the water table. However, it is not considered as a useable source of ground water to wells because of its low permeability and because it probably contains mostly salt water (Hickenbottom, 1988).

The inferred direction of ground-water flow in the vicinity of the site is to the west\southwest based on regional and local topography and drainage patterns. The depth

to first ground water has been measured to be approximately 5 to 15 feet in the area of the site (Alameda County Public Works, 1990).

The site is located approximately 3,500 feet east of San Leandro Bay, which is a smaller portion of San Francisco Bay. The nearest streams to the site are Elmhurst Creek, which is located approximately 1,300 feet north of the site, and San Leandro Creek which is located approximately 6,500 feet south of the site. Both creeks originate in the East Bay Hills, which are a part of the Diablo mountain range, and drain directly into San Leandro Bay. Water enters these creeks by direct runoff from rural and urban areas, through numerous small tributaries, and through numerous storm sewer outlets originating in the urbanized areas. Water also enters the much larger San Leandro Creek from overflow from the East Bay Municipal Utility District's (EBMUD) Lake Chabot reservoir located in the East Bay Hills north of the city of Castro Valley.

WELL RESEARCH

A survey of active, inactive, and destroyed water supply wells and monitoring wells listed with the County of Alameda Public Works Agency (CAPWA) within a 1/2-mile radius of the site was performed as part of this investigation. According to Mr. Andreas Godfrey of CAPWA, the records data base is incomplete for wells completed within the last year, whereas the map data supplied by CAPWA is relatively current. The date of the CAPWA data is September 11, 1990.

According to the CAPWA records data base, currently there are no active public-use or domestic-use water producing wells, two industrial-use wells, one irrigation well, and 39 monitoring wells (including 4 extraction wells) within a 1/2-mile radius of the site (see Plate 3, Well Location Map). In addition, there are at least 13 wells of unknown use and 10

destroyed or abandoned wells. The depths of the industrial wells are 448 and 600 feet below the ground surface (bgs), with the level of static water at approximately 59 and 69 feet bgs. The depth of the irrigation well is 175 feet, but the level of static water is unavailable. Monitoring wells located within a 1/2-mile radius of the site range in depth between 20 and 62 feet, and static water levels range in depth between 4 and 15 feet bgs. The depths of the destroyed or abandoned water wells were between 5 and 1,000 feet depth.

Additional well research was performed outside the 1/2-mile radius of the site to a distance of approximately one mile from the site toward the northeast. This additional work was performed after the ground-water flow direction beneath the site was evaluated to be towards the northeast. This additional research yielded one industrial water supply well (N1) approximately 400 feet deep with a static water level of approximately 69 feet bgs, and three irrigation water supply wells (K1, N2, and P2) with depths of 35, 128, and 90 feet bgs, and static water levels of 2, 78, and 8 feet bgs, respectively. The above wells are shown on Plate 3.

PREVIOUS WORK

Prior to the present investigation, Pacific performed an environmental investigation related to the removal of the underground waste-oil storage tank (Pacific, 1989). Applied GeoSystems submitted a work plan to the local regulating agencies for the work performed in the current investigation (Applied GeoSystems, 1989) and also performed a site history and limited environmental records search of the surrounding area (Applied GeoSystems, 1990). The results of these investigations are presented in reports by Applied GeoSystems and Pacific listed in references of this report. A brief summary of previous work performed at the site is included in Appendix A of this report.

FIELD WORK

Drilling

Prior to the drilling, a ground-water protection permit was obtained from the Alameda County Flood Control and Water Conservation District, Zone 7, for the construction of ground-water monitoring wells at the site. A copy of this permit is included in Appendix B. A summary of the field procedures employed by Applied GeoSystems for this investigation are presented in Appendix C. The work for this investigation was performed in accordance with the Site Safety Plan (AGS, 1989).

Five soil borings (B-1 through B-5) were drilled for this investigation on October 30 and 31, 1989, and August 10, 1990. The borings were drilled to depths of 11-1/2 to 24-1/2 feet, by HEW Drilling Company, Inc. of Palo Alto, California, and were logged by an Applied GeoSystems' geologist. The locations of the borings are shown on Plate 2.

On October 30, 1989, boring B-1 was drilled approximately two feet north of the location of the former waste-oil storage tank to enable evaluation of the vertical extent of hydrocarbons in the soil and ground water in the immediate area of the previously reported highest hydrocarbon levels detected in the soil at the site. On October 31, 1989, boring B-2 was drilled near the northeastern corner of the site to evaluate the presence of hydrocarbons in soil and ground water in the inferred upgradient direction from the former waste-oil tank. A third boring (B-3), located in the northwestern portion of the site, could not be advanced beyond an approximate depth of three feet after ten attempts due to metallic slag, concrete, and gravel material encountered during drilling, and resulting in refusal of the drill auger.

Because of the presence of a black hydrocarbon-like product encountered in boring B-2 during drilling, the ongoing investigation was temporarily halted at the request of Ms. Katherine Chesick of the Alameda County Health Care Services Agency Department of Environmental Health so that a site history assessment and limited environmental records review could be initiated to evaluate potential sources of the black hydrocarbon-like product. This report was completed by Applied GeoSystems on October 1, 1990, and a brief summarization is presented in Appendix A.

On August 10, 1990, boring B-3 was redrilled near the northern site boundary and boring B-4 was drilled near the southeastern corner of the site. These two borings were located to evaluate the presence of hydrocarbons in soil and ground water, and to evaluate the direction of ground-water flow beneath the site. Boring B-5 was drilled near the former waste-oil tank pit excavation to further evaluate the extent of waste-oil hydrocarbons in the soil.

Soil Sampling and Description

Soil samples were collected and described from borings B-1 through B-5 during drilling. A summary of the Unified Soil Classification System used to identify the soil encountered during drilling is presented on Plate 4, and the descriptions of the soil encountered are presented on the Logs of Borings (Plates 5 through 12). Soil samples were collected at intervals of five feet or less from the ground surface to the total depth of the borings. A summary of the sampling methods used for this investigation are presented in Appendix C.

The earth materials encountered in borings B-1 through B-5 consisted primarily of sandy to silty clay. Artificial fill material consisting predominantly of damp, brown silty clay was encountered from immediately below the asphalt and baserock covering the site to a depth

of approximately 3 feet. Artificial fill consisting of a wide variety of materials such as metallic slag, sandy gravel to gravel, and concrete debris was encountered at depths of approximately 3 to 7 feet. Beneath these heterogeneous fill materials, a relatively homogeneous damp to moist, gray silty clay was encountered to depths of approximately 10 to 13 feet. In boring B-3, an approximately one-foot-thick lens of moist to wet, black clayey sand was encountered between the depths of 8 to 9 feet. Beneath the relatively homogeneous silty clay, ground water was encountered in a moist to wet, olive-brown to gray silty to sandy clay, which extended to a depth of approximately 18 feet. Ground water was encountered in borings B-1 and B-2 at a depth of approximately 13 feet, in boring B-3 at approximately 9 feet, and in boring B-4 at approximately 15 feet. Damp to moist, brown to gray silty clay was encountered beneath the wet silty to sandy clay to the bottom of the borings. Descriptions of the earth materials encountered in the borings are shown on the Logs of the Borings and graphic interpretations of the soil stratigraphy beneath the site as shown on Geologic Cross Sections A-A', B-B', and C-C' (Plates 13 through 15).

No subjective evidence of hydrocarbons were noted during drilling except in boring B-2. Field organic vapor meter (OVM) measurements of soil samples from boring B-2 ranging from 50 to over 1,000 ppm were noted at depths of approximately 5 to 20 feet. Two soil samples collected at the approximate depths of 13 and 16 feet in boring B-2 were saturated with a black, viscous, hydrocarbon-like product. The augers used to drill boring B-2 were coated with the black viscous product encountered between the depths of approximately 13 to 18 feet.

Sampling of Stockpiled Soil

One composite soil sample (SP-0619-1A, -1B, -1C, -1D) was collected from the approximately one cubic yard of stockpiled drill cuttings from borings B-1 and B-2 on June

19, 1990. A second composite soil sample (S-B3-1, S-B3-2, S-B4-1, S-B4-2, and S-B4-3) was collected from approximately one cubic yard of drummed drill cuttings from borings B-3 through B-5 on August 16, 1990. A description of the composite soil sample collection procedures is included in Appendix C of this report.

Monitoring Well Construction

Monitoring wells MW-1 through MW-4 were constructed in borings B-1 through B-4, respectively. Well casings were set in the wells to a depth of approximately 18 feet, except for well MW-1, which was constructed to a depth of approximately 23 feet. The screened casings for wells MW-1 and MW-2 consisted of 4-inch-diameter, 0.020-inch machine-slotted PVC set from the total depth of the wells to approximately 13 feet below the ground surface. The screened casings for wells MW-3 and MW-4 consisted of 4-inch-diameter, 0.010-inch machine-slotted PVC set from the total depth of the wells to approximately 7 feet below the ground surface. Blank PVC casing was set from the top of the screened casing to within a few inches below the ground surface. Construction of the wells was completed, and the wells were developed, according to the methods described in Appendix C.

Ground-Water Sampling and Measurement of Ground-Water Levels

The first episode of ground-water monitoring was performed on June 19, 1990 after the installation of wells MW-1 and MW-2 at the site. Ground-water level measurements were taken and water samples were collected from ground-water monitoring well MW-1 for subjective analysis after waiting for a period of at least 48 hours subsequent to the development of well MW-1 on June 6, 1990. Water samples collected from well MW-1 showed no evidence of measurable floating product or product sheen, however, water samples collected from well MW-2 contained a dark semi-viscous fluid with an obvious

hydrocarbon product odor. Ground-water monitoring well MW-1 was then purged and sampled for laboratory analysis on June 19, 1990. Well MW-2 was not sampled due to the presence of approximately 11 inches of hydrocarbon product in the well. The product was removed from the well by bailing, and placed in a 55-gallon, 17E Department of Transportation (DOT) drum for temporary storage.

A second episode of ground-water monitoring was performed on August 16, 1990 after the installation of wells MW-3 and MW-4. Ground-water level measurements were taken and water samples were collected from ground-water monitoring wells MW-1 through MW-4 for subjective analysis after waiting for a period of at least 48 hours subsequent to the development of wells MW-3 and MW-4, and the redevelopment of MW-1 on August 14, 1990. Water samples collected from wells MW-1, MW-3, and MW-4 showed no evidence of measurable floating product or product sheen, however, water samples collected from well MW-2 again contained a dark semi-viscous fluid with an obvious hydrocarbon product odor, and of approximately two inches in thickness. The product was removed from well MW-2 by bailing, and placed in a 55-gallon, 17E DOT drum for temporary storage. Ground-water monitoring wells MW-1, MW-3, and MW-4 were then purged and sampled for laboratory analysis on August 16, 1990. Appendix C contains ground-water level measurement procedures, and a description of subjective analysis and ground-water sampling procedures.

EVALUATION OF GROUND-WATER GRADIENT

On August 16, 1990 the wellheads for the ground-water monitoring wells were surveyed to a local National Geodetic Vertical Datum benchmark by Ron Archer Engineer, Inc., of Pleasanton, California, a licensed land surveyor. The results of this wellhead survey are included in Appendix D, Wellhead Survey. We calculated ground-water elevations for each

well (without floating product present) by subtracting the depth-to-water (DTW) measurements from the surveyed elevation of the wellhead. The DTW measurements, wellhead elevations, and ground-water elevations are presented in Table 1, Ground-Water Elevation Data.

Data from Table 1 were used to produce the Ground-Water Gradient Maps (Plates 16 through 20), which reflect ground-water elevations in monitoring wells MW-1, MW-3, and MW-4 at the site, on August 16 and 21, September 7, and November 20 and 29, 1990. Water elevations from well MW-2 were not used for gradient evaluation due to the presence of product in this well. The ground-water gradients evaluated from the August 16 and 21, September 7, and November 20 and 29, 1990 data indicated gradient magnitudes ranging between 0.010 to 0.012, and the interpreted direction of ground-water flow was toward the northeast (away from San Francisco Bay).

LABORATORY ANALYSES

Soil Samples

Selected soil samples collected from borings B-1 through B-5 were analyzed for total petroleum hydrocarbons as gasoline (TPHg) and the gasoline constituents benzene, toluene, ethylbenzene, and total xylene isomers (BTEX) and using modified Environmental Protection Agency (EPA) Methods 8020/8015/3050, total petroleum hydrocarbons as diesel (TPHd) by EPA Method 8015/3550, total oil and grease (TOG) by EPA Standard Method 503A/E, and the total metals lead, cadmium, chromium, and zinc by EPA Method 6010. One soil sample from a depth of 16 feet from boring B-2 was analyzed for volatile organic compounds (VOCs) by EPA Method 8240, and base neutral and acid extractables (BNAs) by EPA Method 8270. Soil samples were analyzed at Applied Analytical Environmental

Laboratories (California Hazardous Materials Testing Laboratory Certification No. 153) in Fremont, California; Anametrix, Inc. (California State Hazardous Materials Testing Laboratory Certification No. 151) in San Jose, California; and Chromalab Inc. (California State Hazardous Materials Testing Laboratory Certification No. E694) in San Ramon, California. These soil samples were selected for laboratory analysis based on:

- Location above first-encountered ground-water;
- Location in a potential confining or perching layer below first-encountered ground water;
- Areas where the presence of hydrocarbons was suspected; and
- 5-foot intervals and/or change in stratigraphic unit as recommended by ACDEH for definition of hydrocarbons in soil.

Water Samples

Water samples collected from monitoring wells MW-1, MW-3, and MW-4 were analyzed for BTEX and TPHg by EPA Methods 602/8015/3050, TPHd by EPA Method 8015/3550, TOG by EPA Standard Method 503A/E, VOCs by EPA Method 624, BNAs by EPA Method 625, and the total metals cadmium, chromium, organic lead and zinc by EPA Methods 7130, 7190, 7420, and 7950.

RESULTS OF LABORATORY ANALYSES

The cumulative results of the laboratory analyses of soil samples are summarized below and in Table 2. The cumulative results of the laboratory analyses of water samples are summarized below and in Tables 3. Copies of the laboratory analysis data sheets and Chain of Custody Records are included in Appendix E.

Soil Samples

The laboratory analyses of soil samples indicated the following detectable levels:

- elevated levels of TPHg, TPHd, toluene, ethylbenzene, xylene isomers, and TOG ranging from 440 to 52,000 ppm were reported in soil sample S-16-B2 collected at an approximate depth of 16 feet in boring B-2. In addition, detectable levels of the BNAs naphthalene (11.0 ppm), 2-methylnaphthalene (6.0 ppm), butylbenzylphthalate (0.77 ppm), and Di-n-Octyl Phthalate (0.60 ppm) were also reported in this soil sample. Boring B-2 was located near the existing gasoline-storage tanks.

- detectable levels of TOG ranging from 110 to 1,600 ppm, TPHd ranging from 14 to 200 ppm, TPHg ranging from 11 to 52 ppm, and BTEX ranging from 0.012 to 2.7 ppm were reported in soil samples from boring B-1 (near the former waste-oil tank excavation) at a depth of 5 feet, boring B-2 (near the existing gasoline-storage tanks) at depths of 5, 11, 19, and 21 feet, and boring B-4 at depths of 7 and 19-1/2 feet.

- detectable levels for the total metals cadmium, chromium, lead, and zinc were reported at levels below the Total Threshold Limit Concentration Values (TTLC) for soil of Title 22 of the California State Administrative Code, recorded in January 1988 for these respective metals.

- nondetectable levels of TPHg, TPHd, BTEX, and TOG were reported in the soil samples collected from 10, and 24 feet in boring B-1, from boring B-3 at depths of 5 and 20 feet, from boring B-4 at a depth of 10 feet, and from boring B-5 at a depth of 6 feet.

Water Samples

The laboratory analyses of water samples collected from wells MW-1, MW-3, and MW-4 indicated the following results:

- Nondetectable levels of TPHg (less than 20 ppb), TPHd (less than 100 ppb), TOG (less than 5,000 ppb), BTEX (less than 0.5 ppb), VOCs (less than 0.05 ppb), and BNAs (less than 10 to 50 ppb) were reported in the water samples collected.

- Detectable levels of the total metals cadmium, chromium, organic lead, and zinc (0.03 to 0.10 ppm) were reported in the water samples collected.

DISCUSSION AND CONCLUSIONS

Applied GeoSystems concludes the following based on the results of this investigation:

During drilling and sampling of boring B-2/well MW-2 at the site, a black hydrocarbon product was noted in the soil and ground water. Laboratory results for the soil and water samples collected from the boring/well indicate predominantly degraded gasoline hydrocarbons. The lateral extent of gasoline hydrocarbons in the soil and ground water associated with the gasoline-storage tanks at the site have been delineated to the northwest, west, and south, but may extend further towards the property boundary to the east and north. The vertical extent of the gasoline hydrocarbons in the soil associated with the gasoline-storage tanks at the site has been delineated to nondetectable, as indicated by the laboratory results for soil samples collected from boring B-2 below 19 feet.

Laboratory analysis of soil samples collected from the borings for the total metals cadmium, chromium, lead, and zinc reported detectable levels below the Total Threshold Limit Concentration Values for soil of Title 22 of the California State Administrative Code, recorded January 1988, for these respective metals. Laboratory analysis of the ground-water samples collected from wells MW-1, MW-3, and MW-4 for the above total metals reported detectable levels slightly above the Maximum Concentration Levels for Drinking Water as specified by the California State Department of Health Services (DHS) recorded in October 1990, for these respective metals, except for total cadmium which was detected at 0.024 ppm.

In addition, BNAs and VOCs do not appear to have impacted soil or ground water near the former waste-oil tank since the soil and water samples analyzed for these compounds indicated nondetectable concentrations of BNAs and VOCs. The vertical extent of waste-oil hydrocarbons in the soil associated with the former waste-oil-storage tank at the site has been delineated below 100 ppm, as indicated by the laboratory results for soil samples collected from the waste-oil tank pit excavation and borings B-1 and B-5. A level of 110 ppm TOG in a soil sample from boring B-4 may be isolated and possibly associated with the fill materials present beneath the site. TOG is also present in the shallow soil north of the former waste-oil tank as indicated by 1,600 ppm TOG reported in one sample from boring B-1.

During the preparation of the site history assessment (Applied GeoSystems, 1990), it was revealed that the shallow earth materials beneath the site appear to consist of imported fill materials, as evidenced by the presence of metallic slag, concrete, and gravel materials encountered during drilling of borings B-1 through B-4. An earlier geotechnical report (SMFE, 1968) indicated that the fill material consisted of imported sandy gravelly clay, concrete, melted glass, metallic slag, and construction debris, and was imported from unknown sources. These fill materials may be a potential source of the gasoline and diesel hydrocarbons encountered within borings B-2 or B-4 drilled in the inferred upgradient direction of the underground gasoline-storage tanks and near the southern corner of the site.

Another potential source of the hydrocarbon product may have resulted from leakage or over-spilling associated with the onsite underground gasoline-storage tanks prior to purchase of the site by ARCO. This conclusion is based on the fact that Gulf Oil Company removed and replaced a 10,000-gallon underground gasoline-storage tank at the site in the late 1970s, and that no soil sampling data was obtained to demonstrate that leakage and/or overfilling of the tank had not occurred.

Measurements of the ground-water elevations beneath the site between June 6 and November 29, 1990, indicate that the direction of ground-water flow is towards the northeast (away from San Francisco Bay). This direction is opposite from the inferred ground-water gradient direction based on topography, and data presented by Hickenbottom (1988). Evidence uncovered during the site history assessment indicates that a buried tidal slough was present at the site before filling and development took place, and may be influencing the ground-water gradient. The presence of a tidal slough is suggested by the very soft, wet organic materials encountered in boring B-3 between the depths of 9 to 19 feet, and immediately underlying the artificial fill materials.

SMFE also reported in 1968 that shallow perched water was present in the fill materials at a depth of approximately three feet. Commonly, in areas with artificial fill, perched water generally will occur along the boundary between the fill materials and the native soil. This condition may occur seasonally beneath the site.

After artificial filling of the tidal slough at the site occurred, a channel was excavated to provide storm water drainage at the site (City of Oakland, 1968). This channel was then, in turn, filled in with artificial fill around 1969, and replaced with a 72-inch diameter concrete storm drain pipeline. This pipeline was noted in SMFE's report, as well as a 48-inch-diameter sanitary sewer pipeline and a 39-inch-diameter abandoned sanitary sewer pipeline. Based on plans supplied by the City of Oakland, the elevations of these pipelines have been calculated, and graphic representations are shown on the Geologic Cross Sections (Plates 13, 14, and 15). The elevations suggest that these subsurface lines are higher than the water-bearing materials encountered in borings B-1, B-2, and B-4. However, these subsurface lines might act as conduits enabling gasoline and diesel hydrocarbons to migrate horizontally through the fill materials.

It is inferred that tidal influences within the bay channel probably are not transmitted through the sand or gravel packs surrounding the storm drain and sewer lines beneath the site, due to the interpreted elevations of these subsurface lines from plans supplied by the City of Oakland. Due to the proximity of the site to San Francisco Bay, the direction of ground-water flow may be influenced by tidal actions.

LIMITATIONS

This report was prepared in accordance with standards of environmental geological practice generally accepted in California at the time this investigation was performed. This investigation was conducted solely for the purpose of evaluating environmental conditions with respect to hazardous or potentially hazardous materials in the vicinity of the subject property and hydrocarbons at the subject site in the immediate area of the former waste-oil and product-storage tanks. Our investigation is based on a brief reconnaissance, interviews with agency representatives thought to be familiar with the area, examination of aerial photographs of the site area, review of public documents available to us related to site use and field work conducted at the site. Accuracy or completeness of public records used to conduct this limited investigation are not implied. Evaluation of the geologic conditions at the site for the purpose of this investigation is made from a limited number of observation points. Subsurface conditions may vary from the data points available. Further investigation, including subsurface exploration and laboratory testing of soil and ground-water samples at the site, can aid in evaluating subsurface environmental conditions and reduce the inherent uncertainties associated with this type of limited subsurface investigation. No soil engineering or geotechnical references are implied or should be inferred.

REFERENCES CITED

Alameda County Public Works Agency. August 23, 1990. Well Log Information Request for Township T2S and Range R3W near the intersection of Hegenberger Road and Edes Avenue, Oakland, California.

Applied GeoSystems. September 29, 1989. Work Plan for Initial Subsurface Investigation at ARCO Station 4494, 566 Hegenberger Road, Oakland, California. AGS Report 69038-1.

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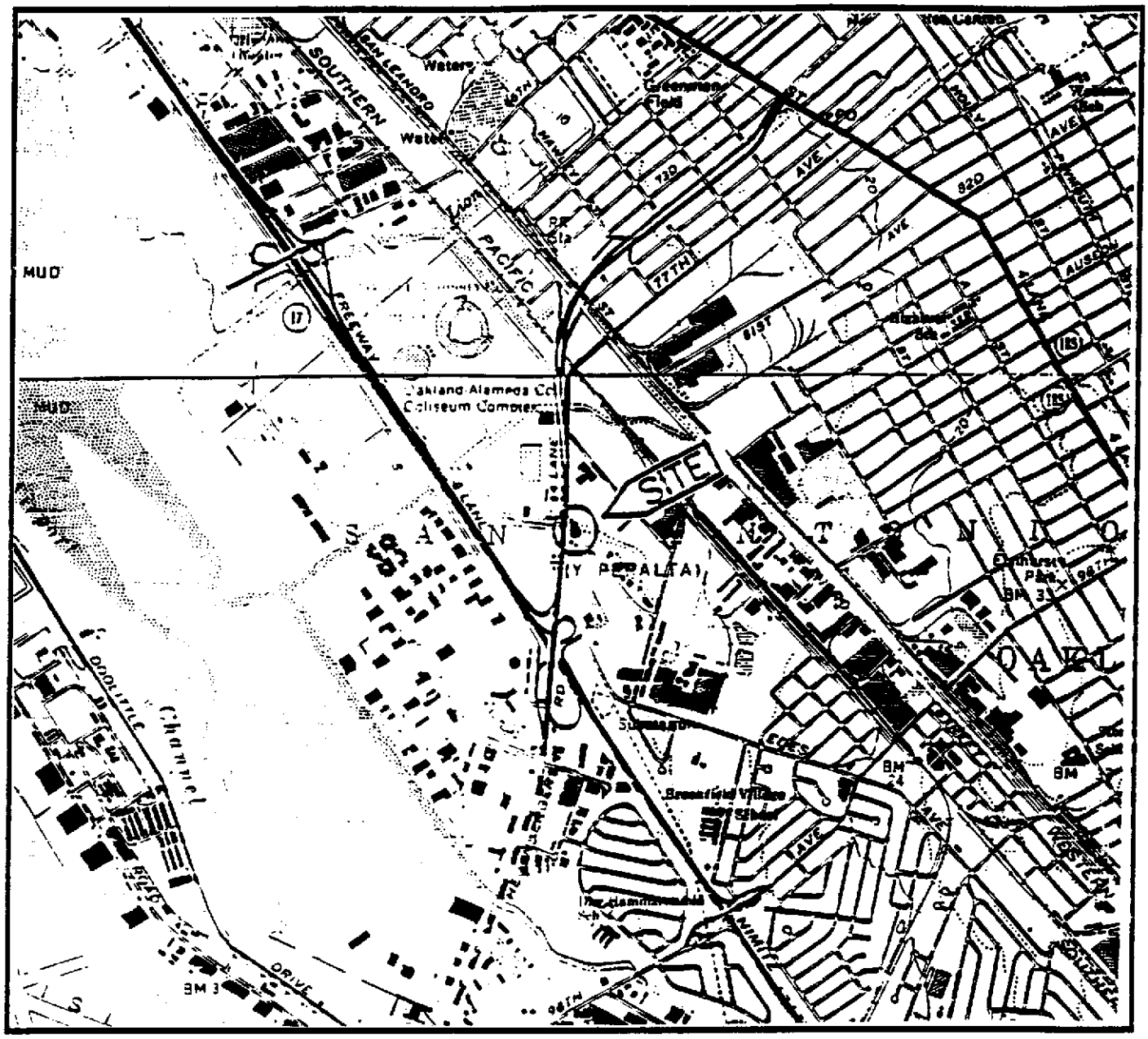

Source: U.S. Geological Survey
7.5-Minute Quadrangle
Oakland East/San Leanaro,
California
Photorevised 1980

N

Approximate Scale

2000 1000 0 2000 4000

feet

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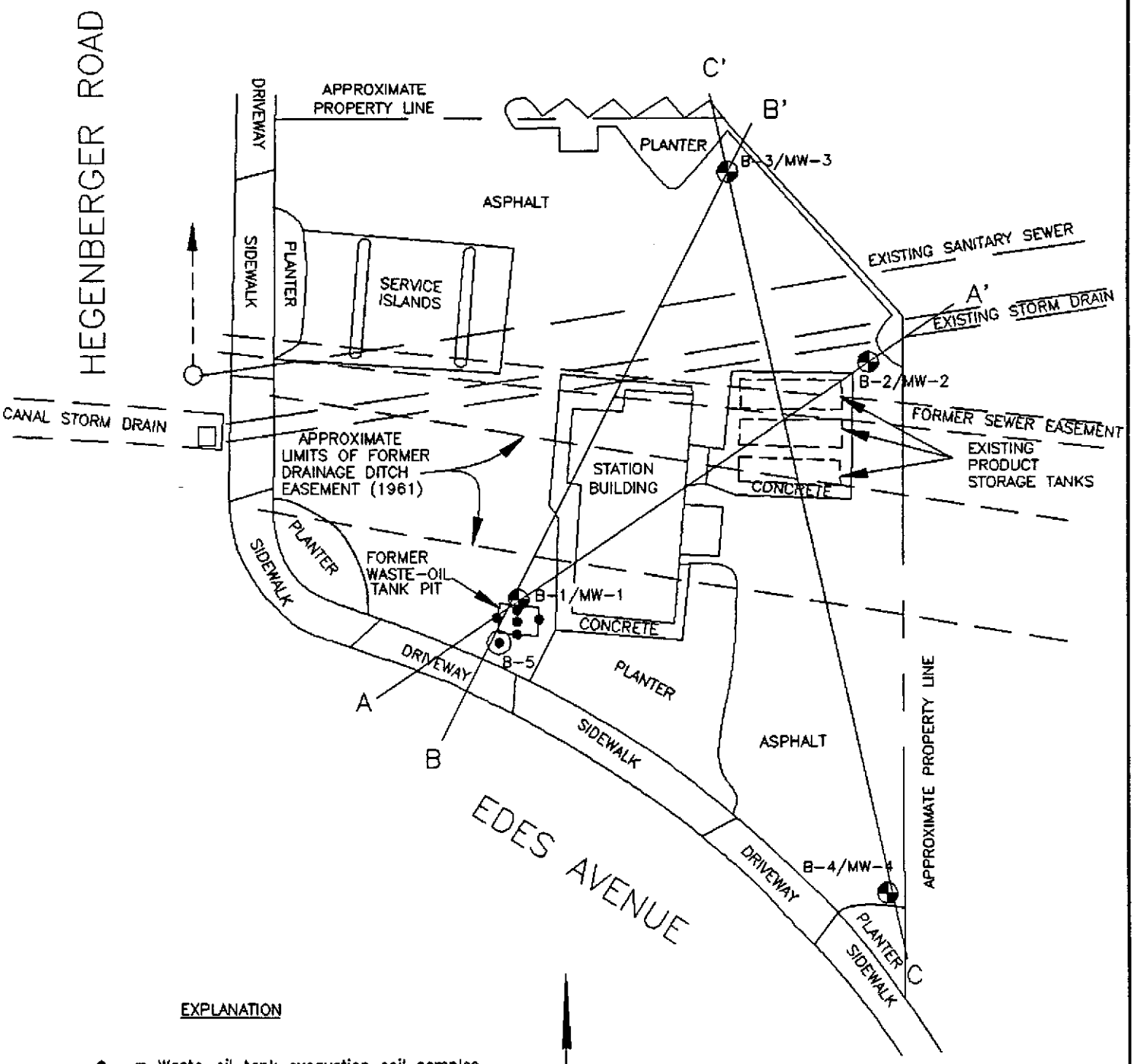
PROJECT 69038-2

SITE VICINITY MAP
ARCO Service Station 4494
566 Hegenberger Road
Oakland, California

PLATE
1



EXPLANATION

◆ = Waste-oil tank excavation soil samples (Pacific Environmental Group, January 1989)

B-4/MW-4 = Monitoring wells (Applied GeoSystems, October 1989 and August 1990)

B-5 = Soil boring (Applied GeoSystems, August 1990)

C–C' = Geologic Cross Sections

N

Approximate Scale

40 20 0 40 80

feet

Source: Modified from plans supplied by ARCO Products Co. (dated August 12, 1982) and City of Oakland Dept. of Public Works (dated December 19, 1961).

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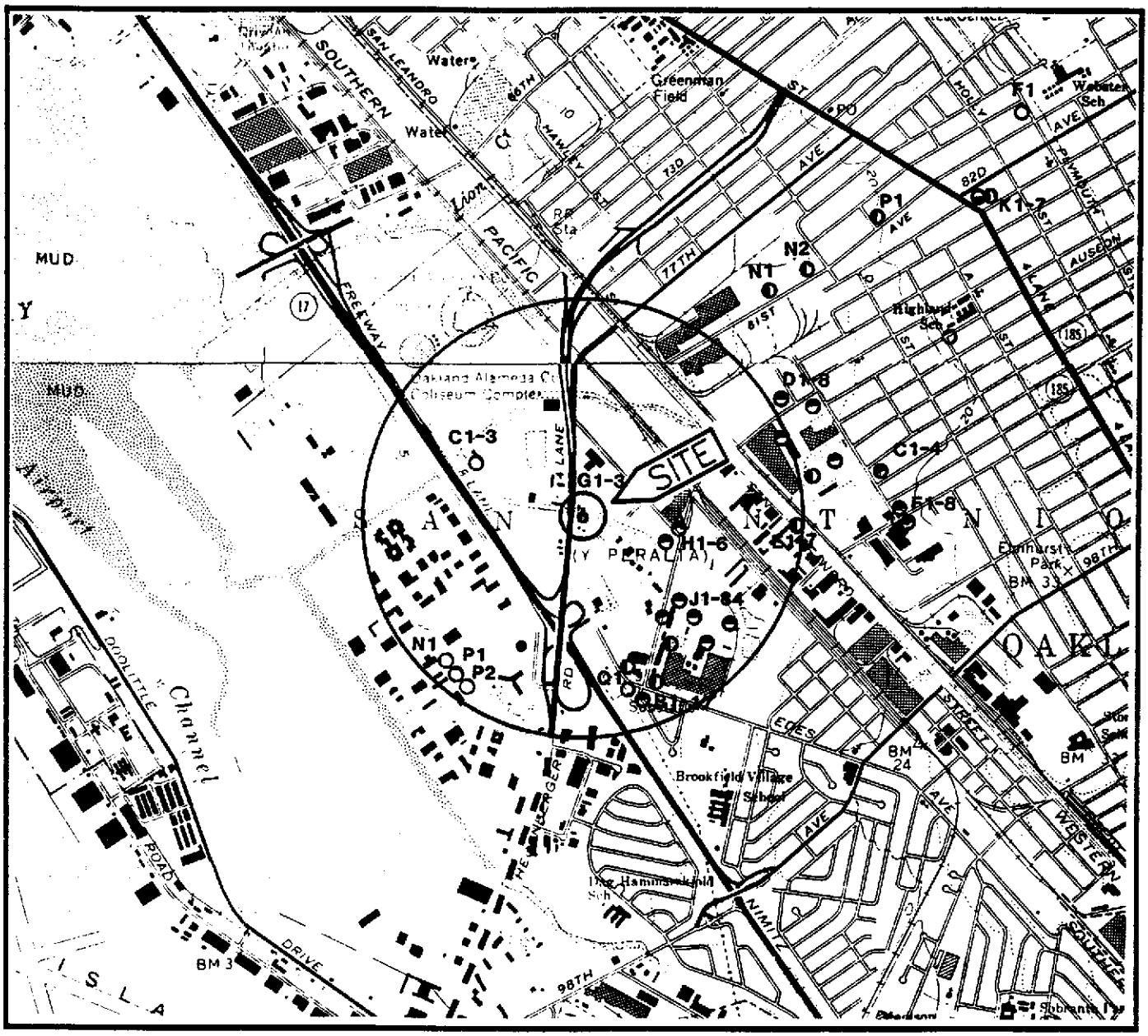
PROJECT 69038-2

GENERALIZED SITE PLAN
ARCO Service Station 4494
566 Hegenberger Road
Oakland, California

PLATE

2



Source: U.S. Geological Survey
7.5–Minute Quadrangle
Oakland East/San Leandro,
California
Photorevised 1980

O = Water well of unkown use

◐ = Water supply (irrigation industrial)

◓ = Monitoring Well (including extraction or recovery wells)

N

Approximate Scale

2000 1000 0 2000 4000

feet

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PROJECT 69038-2

WELL LOCATION MAP
ARCO Service Station 4494
566 Hegenberger Road
Oakland, California

PLATE 3

UNIFIED SOIL CLASSIFICATION SYSTEM

MAJOR DIVISION		LTR	DESCRIPTION	MAJOR DIVISION		LTR	DESCRIPTION
COARSE-GRAINED SOILS	GRAVEL AND GRAVELLY SOILS	GW	Well-graded Gravels or Gravel-Sand mixtures, little or no fines.	FINE-GRAINED SOILS	SILTS AND CLAYS LL<50	ML	Inorganic Silts and very fine sands, rock flour, Silty or Clayey fine Sands, or Clayey Silts with slight plasticity.
		GP	Poorly-graded Gravels or Gravel-Sand mixtures, little or no fines.			CL	Inorganic Clays of low to medium plasticity, Gravelly Clays, Sandy Clays, Silty Clays, Lean Clays.
		GM	Silty Gravels, Gravel-Sand-Silt mixtures.			OL	Organic Silts and Organic Silt-Clays of low plasticity.
		GC	Clayey Gravel, Gravel-Sand-Clay mixtures.		SILTS AND CLAYS LL>50	MH	Inorganic Silts, micaceous or diatomaceous fine Sandy or Silty Soils, Elastic Silts.
	SAND AND SANDY SOILS	SW	Well-graded Sand or Gravelly Sands, little or no fines.			CH	Inorganic Clays of high plasticity, fat Clays.
		SP	Poorly-graded Sands or Gravelly Sands, little or no fines.			OH	Organic Clays of medium to high plasticity, organic Silts.
		SM	Silty Sands, Sand-Silt mixtures.				
		SC	Clayey Sands, Sand-Clay mixtures.	HIGHLY ORGANIC SOILS		PT	Peat and other highly Organic Soils.


Depth through which sampler is driven


Relatively undisturbed sample


No sample recovered


Static water level observed in well/boring


Initial water level observed in boring

S-10 Sample number


Sand pack


Bentonite


Neat cement


Caved native soil


Blank PVC


Machine-slotted PVC

P.I.D. Photoionization detector

BLOWS REPRESENT THE NUMBER OF BLOWS OF A 140-POUND HAMMER FALLING 30 INCHES TO DRIVE THE SAMPLER THROUGH EACH 6 INCHES OF AN 18-INCH PENETRATION.

DASHED LINES SEPARATING UNITS ON THE LOG REPRESENT APPROXIMATE BOUNDARIES ONLY. ACTUAL BOUNDARIES MAY BE GRADUAL LOGS REPRESENT SUBSURFACE CONDITIONS AT THE BORING LOCATION AT THE TIME OF DRILLING ONLY.

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PROJECT 69038-2

UNIFIED SOIL CLASSIFICATION SYSTEM AND SYMBOL KEY
ARCO Service Station 4494
566 Hegenberger Road
Oakland, California

PLATE 4

Total depth of boring: 24-1/2 feet Diameter of boring: 10 inches Date drilled: 10-30-89

Casing diameter: 4 inches Length: 23 feet Slot size: 0.020-inch

Screen diameter: 4 inches Length: 10 feet Material type: Sch 40 PVC

Drilling Company: HEW Drilling Co., Inc. Driller: Tomas & Perfecto

Method Used: Hollow-Stem Auger Field Geologist: Steve Bittman

Signature of Registered Professional: _____

Registration No.: CE 044600 State: CA

Depth	Sample No.	Blows	P.I.D.	USCS Code	Description	Well Const.
					Paved entrance area.	
0					Asphalt (4 inches) and baserock (10 inches).	
2				CH	Silty clay, gray-brown, damp, high plasticity, very stiff; some minor debris; noticeable odor; fill.	
4	S-5	5 6 7	0.6	CL	Silty clay with angular metallic slag fragments, black, moist, medium plasticity, stiff; noticeable odor; fill.	
6				CH	Silty clay, gray, damp, high plasticity, very stiff.	
8				▼	(8/21/90)	
10	S-10	5 7 10	0		Moist.	
12				▽		
14	S-15	4 7 9	0	CL	Sandy clay, brown, wet, medium plasticity, stiff.	
16						
18				CH	Silty clay, gray, moist, high plasticity, very stiff.	
20	S-20	6 8 14	0		(Section continues downward)	

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LOG OF BORING B-1/MW-1

ARCO Station 4494
566 Hegenberger Road
Oakland, California

PLATE 5

Depth	Sample No.	BLOWS	P.I.D.	USCS Code	Description	Well Const.
22				CH	Silty clay, gray, moist, high plasticity, very stiff.	
24	S-24	7 9 15	0			
					Total Depth = 24-1/2 feet.	
26						
28						
30						
32						
34						
36						
38						
40						
42						
44						
46						
48						
50						

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PROJECT 69038-2

LOG OF BORING B-1/MW-1
ARCO Station 4494
566 Hegenberger Road
Oakland, California

PLATE 6

Total depth of boring: 21-1/2 feet Diameter of boring: 10 inches Date drilled: 10-31-89

Casing diameter: 4 inches Length: 18 feet Slot size: 0.020-inch

Screen diameter: 4 inches Length: 5 feet Material type: Sch 40 PVC

Drilling Company: HEW Drilling Co., Inc. Driller: Tomas & Perfecto

Method Used: Hollow-Stem Auger Field Geologist: Steve Bittman

Signature of Registered Professional: _____

Registration No.: CE 044600 State: CA

Depth	Sample No.	Blows	P.I.D.	USCS Code	Description	Well Const.
					Paved parking area.	
0					Asphalt (4 inches) and baserock (10 inches).	
2				CH	Silty clay, gray-brown, damp, high plasticity, very stiff; some minor debris; fill.	
4		10				
	S-5	15 20	50	CL	Silty clay with angular versiculated glass fragments, black, moist, medium plasticity, hard; noticeable odor; fill.	
6				CH	Silty clay, dark gray, damp, high plasticity, very stiff; noticeable odor.	
8						
10		11 9				
	S-10	9	280	CL	Sandy clay, gray, moist, medium plasticity, very stiff; obvious odor.	
12		3 6				
	S-12.5	9	490	▽	Wet at 12-1/2 feet. Black viscous fluid present. Stiff.	
14						
		2 4				
16	S-16	7	1000+		Black, fluid slightly less viscous.	
18		5 10		CH	Silty clay, gray, moist, high plasticity, very stiff; obvious odor.	
	S-19	16	800+			
20					Damp, noticeable odor.	
	S-21		5			
					Total Depth = 21-1/2 feet.	

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PROJECT 69038-2

LOG OF BORING B-2/MW-2

ARCO Station 4494
566 Hegenberger Road
Oakland, California

PLATE 7

Total depth of boring: 23-1/2 feet Diameter of boring: 10 inches Date drilled: 8-10-90

Casing diameter: 4 inches Length: 18 feet Slot size: 0-010 inch

Screen diameter: 4 inches Length: 11 feet Material type: Sch 40 PVC

Drilling Company: HEW Drilling Co., Inc. Driller: Anibal & Mike

Method Used: Hollow Stem Auger Field Geologist: Steve Bittman

Signature of Registered Professional:

Registration No.: CE 044600 State: CA

Depth	Sample No.	Blows	P.I.D.	USCS Code	Description	Well Const.
					Paved parking area.	
0					Asphalt (4 inches) and baserock (10 inches).	
2				CL	Silty clay, brown, damp, low to medium plasticity, stiff; some minor debris; fill.	
4	S-4.5	8		CH	Silty clay with interbeds of fine-sand and metallic slag fragments, black, damp, high plasticity, stiff; fill.	
	S-5	6 5	0			
6					Moist.	
8				SC	Clayey sand, medium-grained, black, very moist, medium dense; noticeable odor.	
			7.0		Water at 9 feet.	
10	S-9.5	1		CH	Silty clay, blue-gray, wet, high plasticity, very soft; small plant rootlets throughout.	
	S-10	1 1	0			
12					Very easy drilling.	
14	S-14.5	1			Some minor coarse sand interbeds.	
	S-15	1 1	0			
16						
18					Harder drilling begin at 18-1/2 feet.	
20	S-19.5	3		CL	Silty clay, brown, damp, medium plasticity, stiff.	
	S-20	6 6	0		(Section continues downward)	

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PROJECT 69038-2

LOG OF BORING B-3/MW-3
ARCO Station 4494
566 Hegenberger Road
Oakland, California

PLATE 8

Depth	Sample No.	BLOWS	P.I.D.	USCS Code	Description	Well Const.
22	S-22.5 S-23	4 5 6	0	CL	Silty clay, brown, damp, medium plasticity, stiff.	
24					Total Depth = 23-1/2 feet.	
26						
28						
30						
32						
34						
36						
38						
40						
42						
44						
46						
48						
50						

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PROJECT 69038-2

LOG OF BORING B-3/MW-3
ARCO Station 4494
566 Hegenberger Road
Oakland, California

PLATE 9

Total depth of boring: 22-1/2 feet Diameter of boring: 10 inches Date drilled: 8-10-90

Casing diameter: 4 inches Length: 18 feet Slot size: 0.010-inch

Screen diameter: 4 inches Length: 11 feet Material type: Sch 40 PVC

Drilling Company: HEW Drilling Co., Inc. Driller: Anibal & Mike

Method Used: Hollow Stem Auger Field Geologist: Steve Bittman

Signature of Registered Professional: _____

Registration No.: CE 044600 State: CA

Depth	Sample No.	Blows	P.I.D.	USCS Code	Description	Well Const.
					Paved parking area.	
0					Asphalt (4 inches) and baserock (10 inches).	
2				CH	Silty clay, black, damp, high plasticity, very stiff; some minor debris; fill.	
4	S-4.5 S-5	30 45 52	0	GP	Sandy gravel, black, damp, very dense; abundant metallic slag fragments; fill.	
6					Easier drilling beginning at 6 feet.	
8	S-7	6 7 8	0	CH ▼	Silty clay with minor sand, black, moist, high plasticity, stiff. (8/21/90)	
10	S-9.5 S-10	3 3 4	0		Minor coarse sand, very moist; firm.	
12						
14	S-14.5 S-15	2 2 5	0	▽ CL	Sandy clay, olive-brown, wet, medium plasticity; firm.	
16						
18					Harder drilling beginning at 18 feet.	
20	S-19.5 S-20	3 4 6	0	CH	Silty clay, brown, damp, high plasticity, stiff. (Section continues downward)	

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PROJECT 69038-2

LOG OF BORING B-4/MW-4

ARCO Station 4494
566 Hegenberger Road
Oakland, California

PLATE 10

Depth	Sample No.		BLOWS	P.I.D.	USCS Code	Description	Well Const.
22	S-23		3 4 8	0	CH	Silty clay, brown, damp, high plasticity, stiff. Gray.	
						Total Depth = 22-1/2 feet.	

24
26
28
30
32
34
36
38
40
42
44
46
48
50

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PROJECT 69038-2

LOG OF BORING B-4/MW-4
ARCO Station 4494
566 Hegenberger Road
Oakland, California

PLATE
11

Total depth of boring: 11-1/2 feet Diameter of boring: N/A Date drilled: 8-10-90

Casing diameter: N/A Length: N/A Slot size: N/A

Screen diameter: N/A Length: N/A Material type: N/A

Drilling Company: HEW Drilling Co., Inc. Driller: Anibal & Mike

Method Used: Hollow Stem Auger Field Geologist: Steve Bittman

Signature of Registered Professional: _____

Registration No.: _____ State: _____

Depth	Sample No.	Blows	P.I.D.	USCS Code	Description	Well Const.
					Paved entrance area.	
0					Asphalt (4 inches) and baserock (10 inches).	
2				CL	Silty clay, black, damp, medium plasticity, stiff; some metallic fragments to 1-inch diamter dispersed throughout; fill.	
4				CH	Silty clay, black, damp, high plasticity; firm	
6	S-5.5 S-6	2 3 4	0			
8						
10	S-10.5 S-11	4 5 7	0		Some coarse sand, dark brown, moist, very stiff.	
12					Total Depth = 11-1/2 feet.	
14						
16						
18						
20						

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PROJECT 69038-2

LOG OF BORING B-5

ARCO Station 4494
566 Hegenberger Road
Oakland, California

PLATE 12

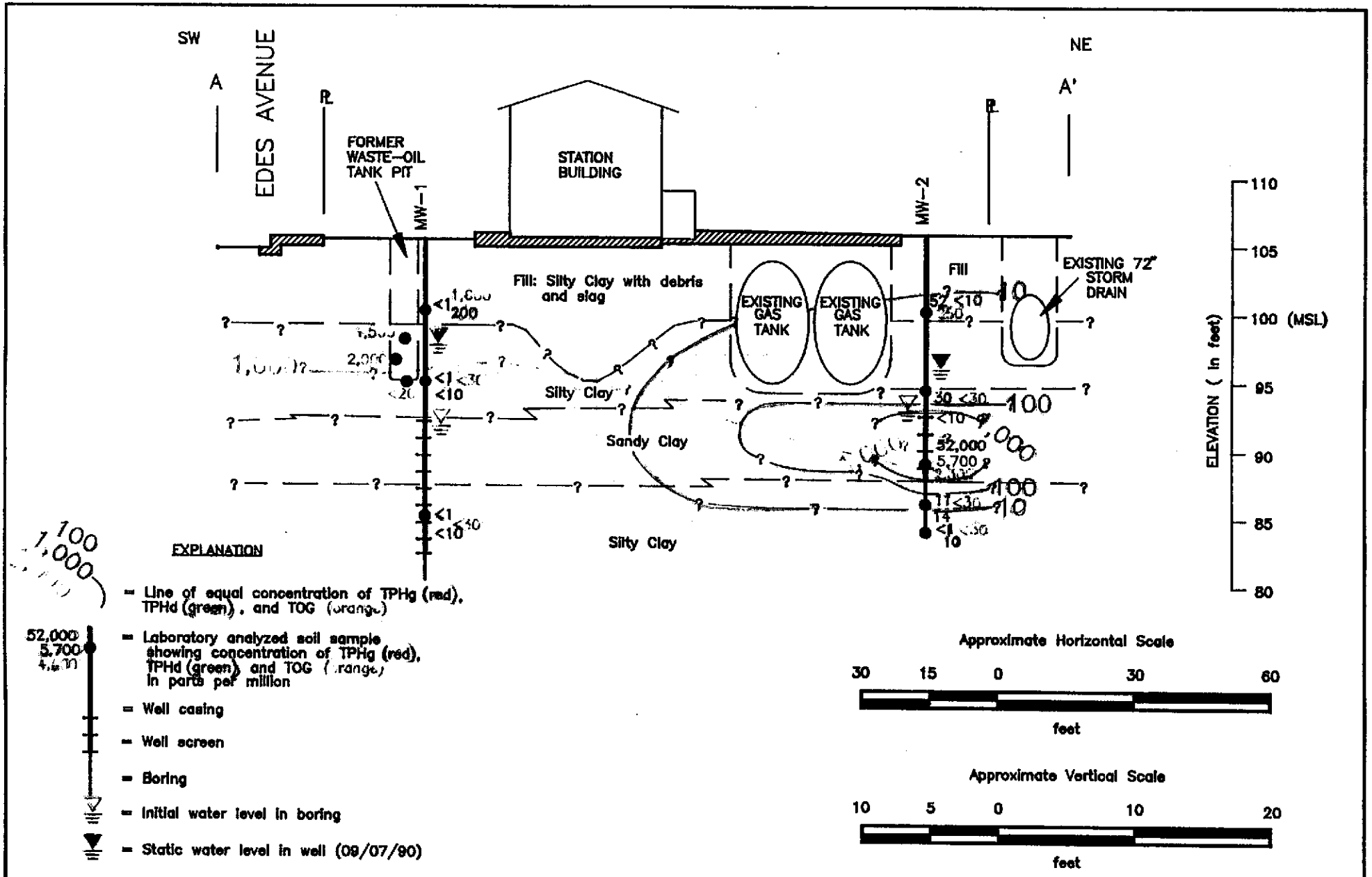
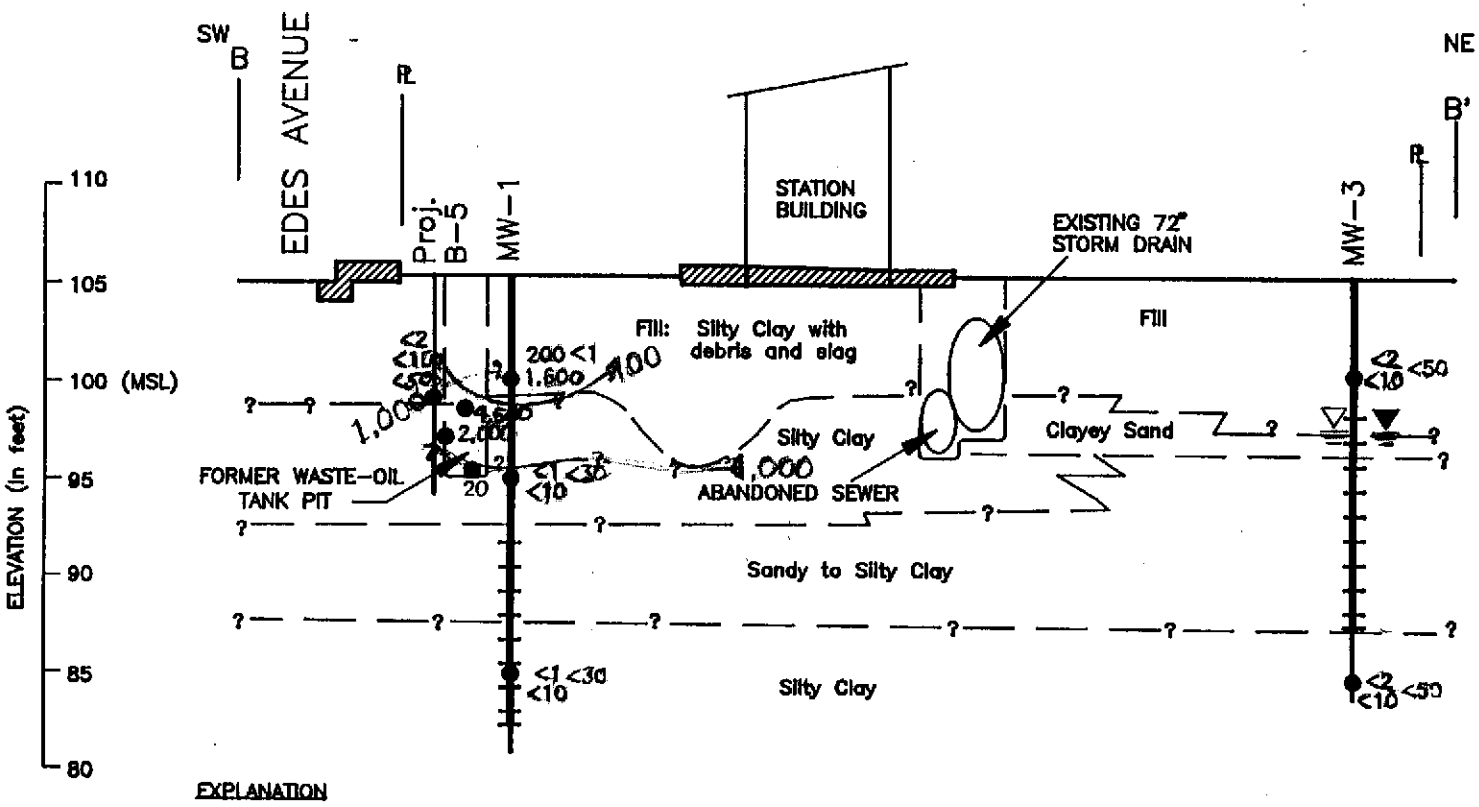


PLATE 13

GEOLOGIC CROSS SECTION A-A'
ARCO Service Station 4494
566 Hegenberger Road
Oakland, California

Applied GeoSystems

PROJECT 89038-2



EXPLANATION

100 / 1,000 = Line of equal concentration of TPHd (green), and TOG (orange)

<2 / 200 / 1,600 = Laboratory analyzed soil sample showing concentration of TPHg (red), TPHd (green), and TOG (orange) in parts per million

= Well casing

= Well screen

= Boring

= Initial water level in boring

= Static water level in well (09/07/90)

Approximate Horizontal Scale

30 15 0 30 60

feet

Approximate Vertical Scale

10 5 0 10 20

feet

PLATE 14

GEOLOGIC CROSS SECTION B-B'
ARCO Service Station 4494
566 Hegenberger Road
Oakland, California

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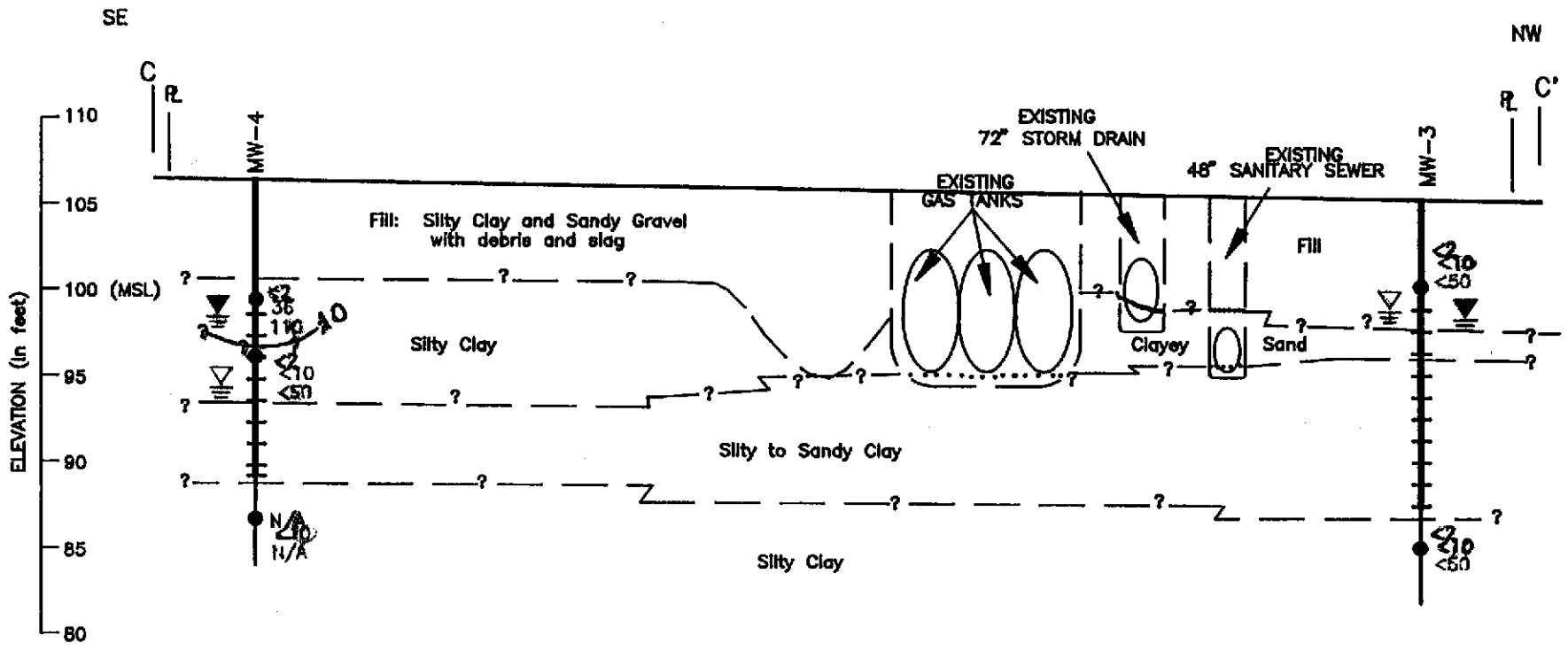
PROJECT 69038-2



EXPLANATION

10 = Line of equal concentration of TPHd (green)

= Laboratory analyzed soil sample showing concentration of TPHg (red), TPHd (green), and TOG (orange) in parts per million

= Well casing

= Well screen

= Boring

= Initial water level in boring

= Static water level in well (09/07/90)

Approximate Horizontal Scale

30 15 0 30 60

feet

Approximate Vertical Scale

10 5 0 10 20

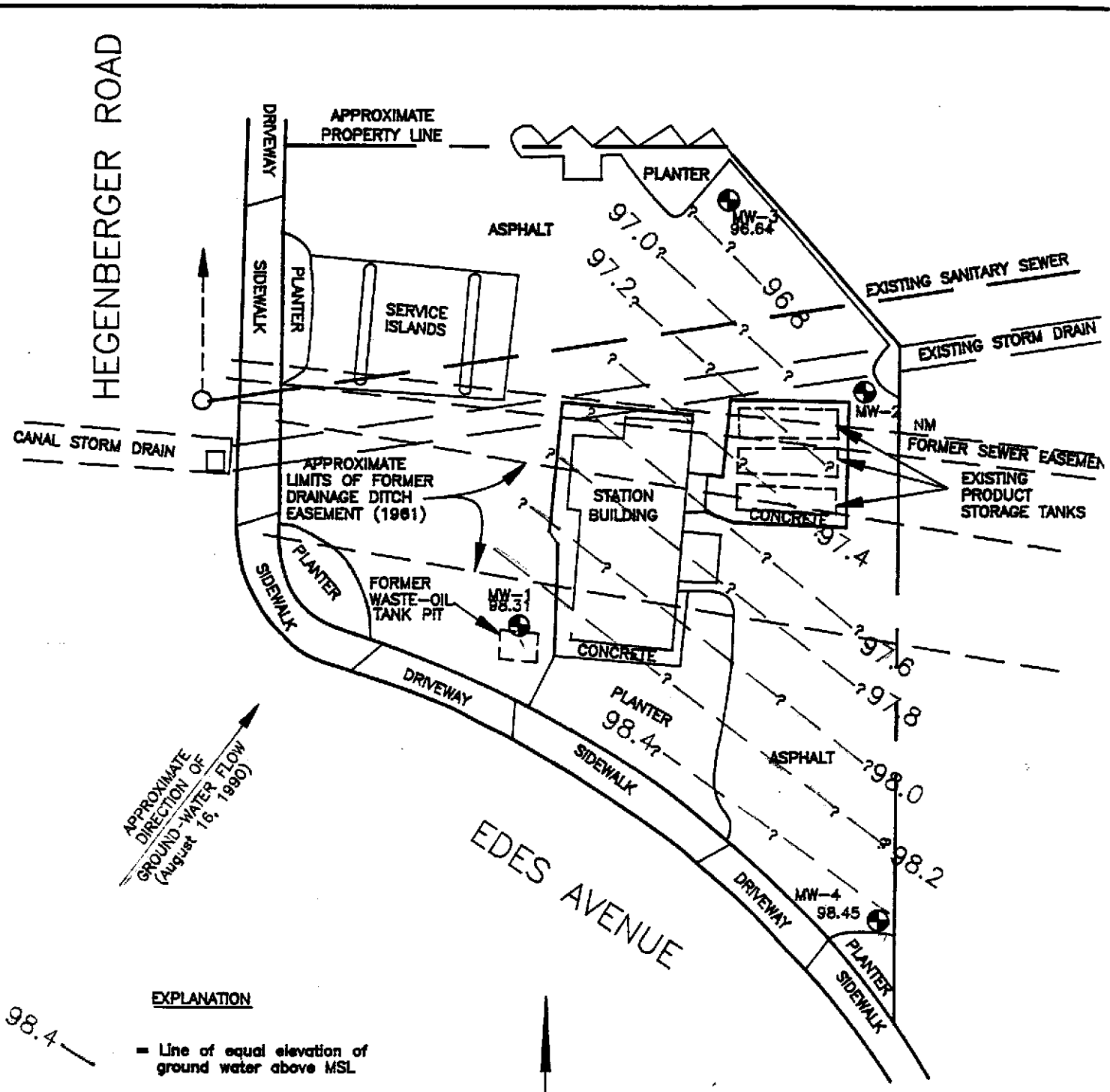
feet

PLATE 15

GEOLOGIC CROSS SECTION C-C'
ARCO Service Station 4494
566 Hegenberger Road
Oakland, California

Applied GeoSystems

PROJECT 60038-2



Source: Modified from plans supplied by ARCO Products Co. (dated August 12, 1982) and City of Oakland Dept. of Public Works (dated December 19, 1961).

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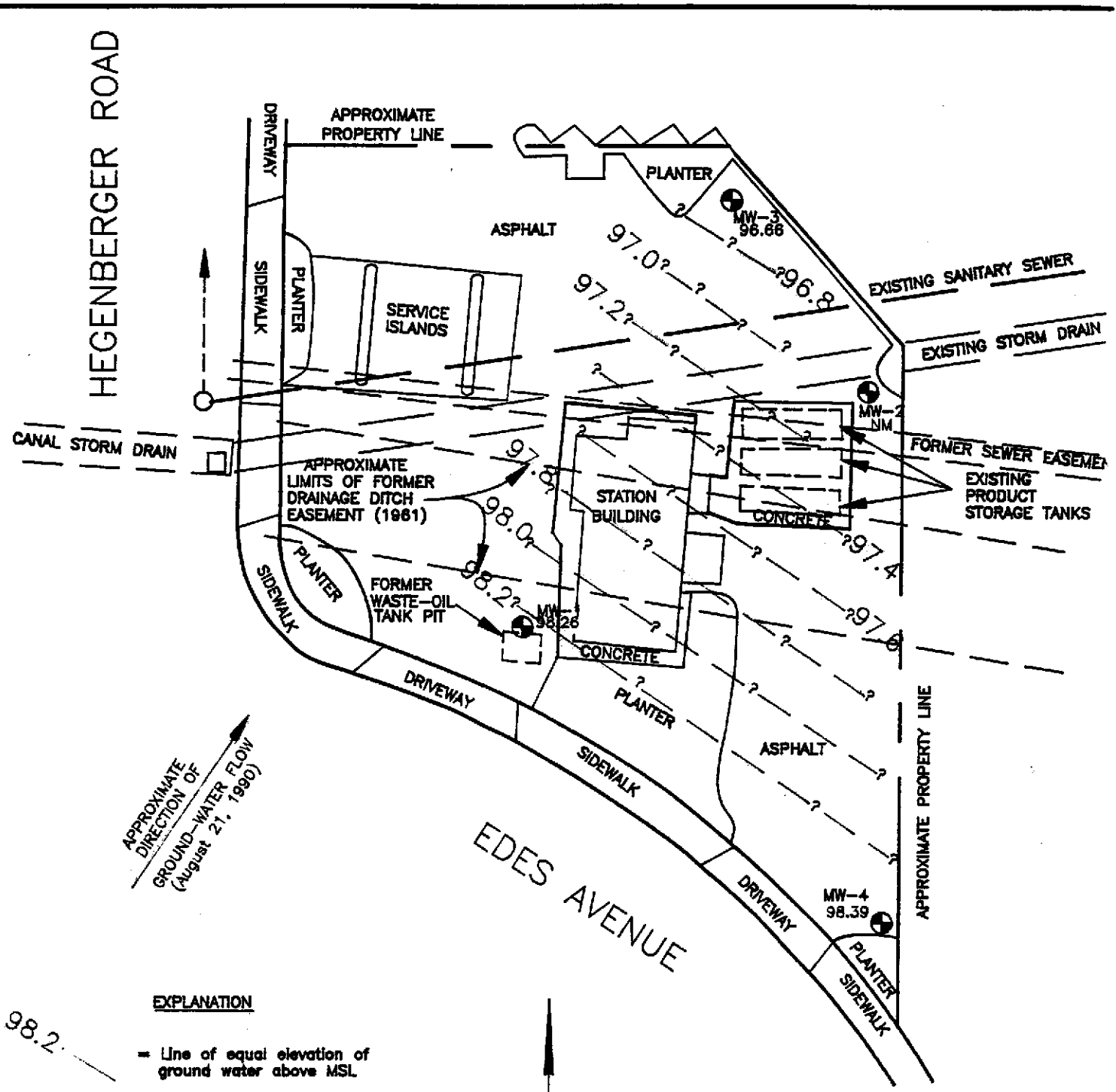
PROJECT 69038-2

GROUND-WATER GRADIENT MAP
August 16, 1990
ARCO Service Station 4494
566 Hegenberger Road
Oakland, California

PLATE 16



Source: Modified from plans supplied by ARCO Products Co. (dated August 12, 1982) and City of Oakland Dept. of Public Works (dated December 19, 1981).

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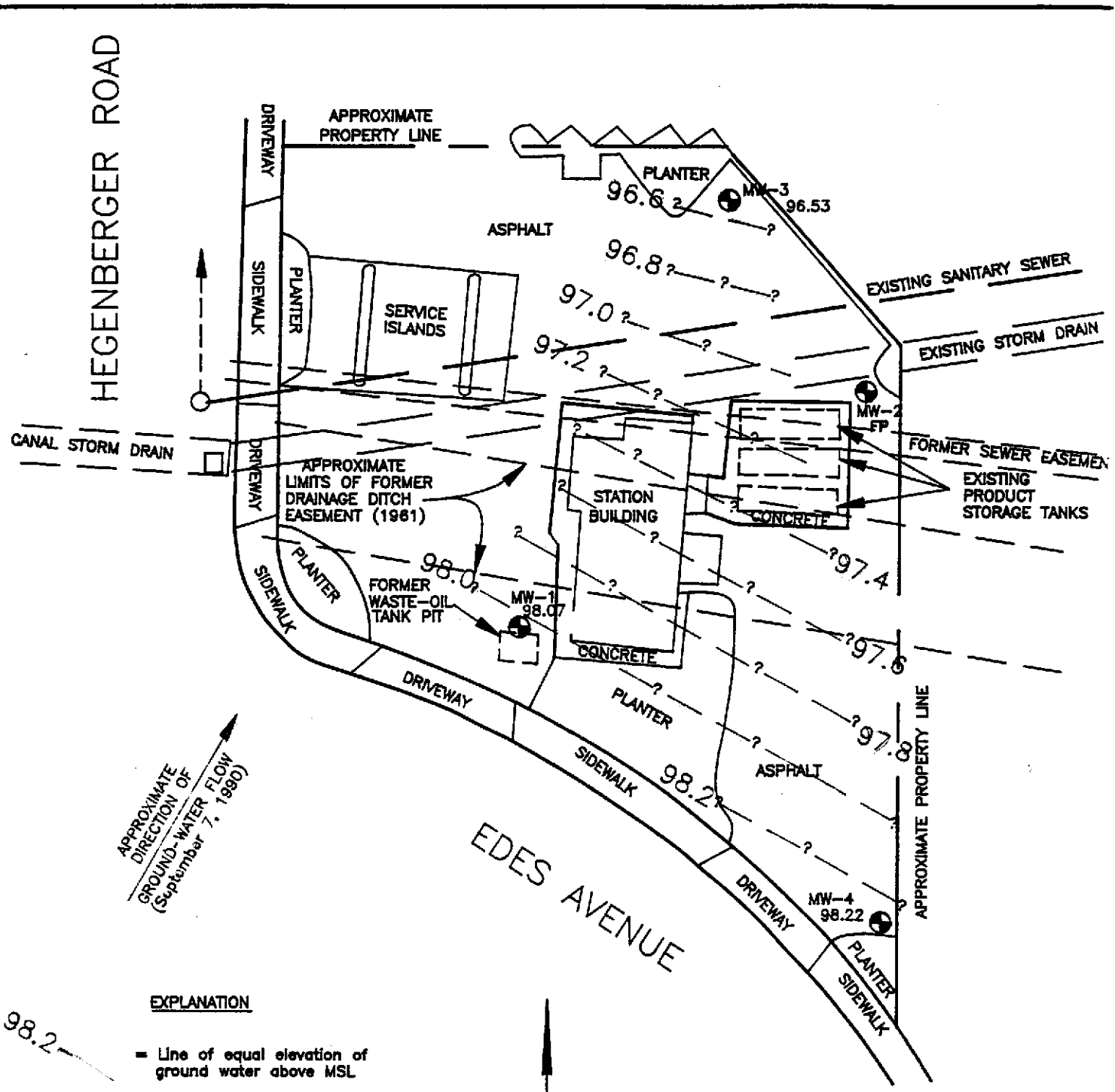
PROJECT 69038-2

GROUND-WATER GRADIENT MAP
August 21, 1990
ARCO Service Station 4494
566 Hegenberger Road
Oakland, California

PLATE 17



Source: Modified from plans supplied by ARCO Products Co. (dated August 12, 1982) and City of Oakland Dept. of Public Works (dated December 19, 1961).

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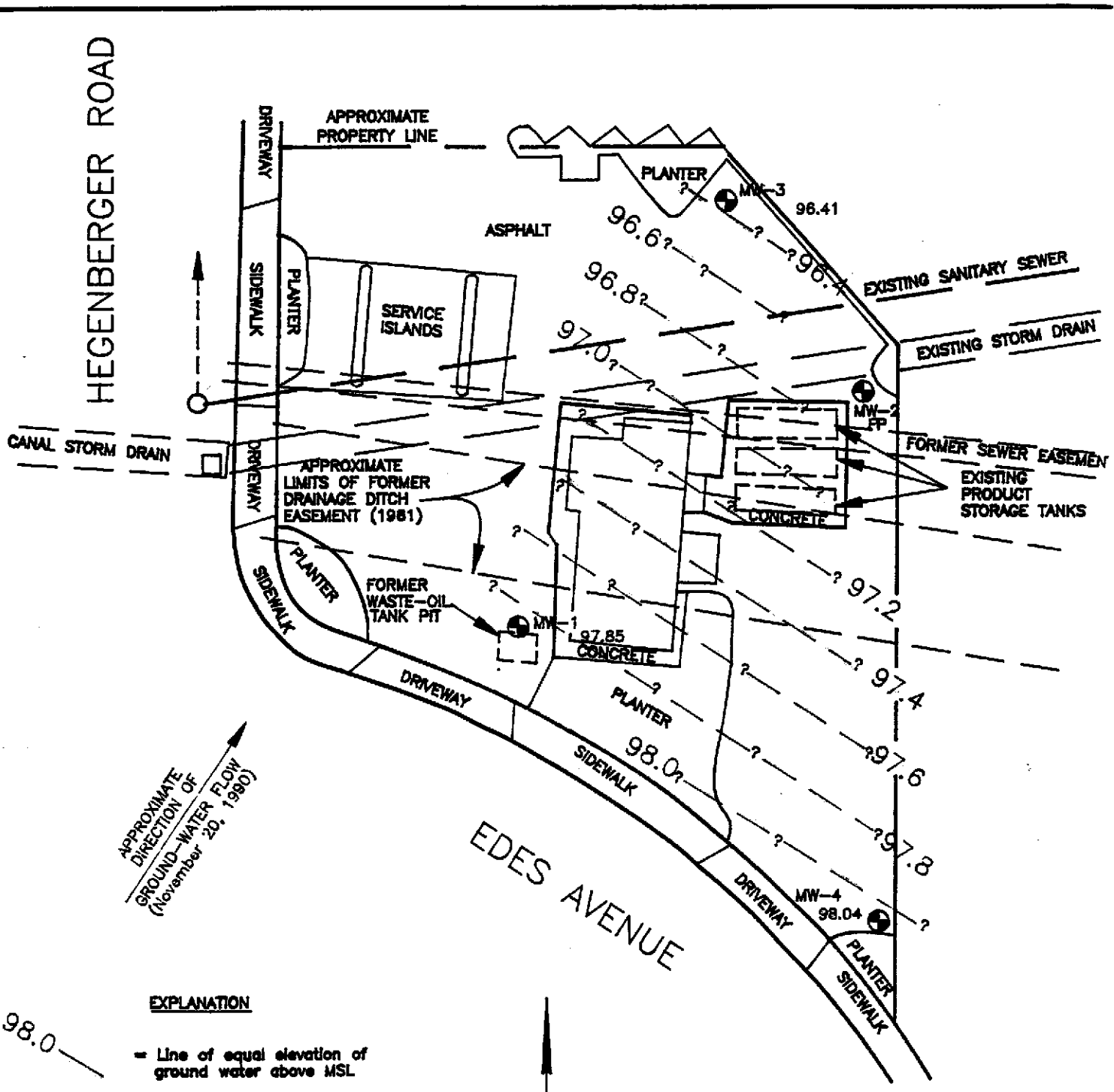
PROJECT 69038-2

GROUND-WATER GRADIENT MAP
September 7, 1990
ARCO Service Station 4494
566 Hegenberger Road
Oakland, California

PLATE 18



Source: Modified from plans supplied by ARCO Products Co. (dated August 12, 1982) and City of Oakland Dept. of Public Works (dated December 19, 1961).

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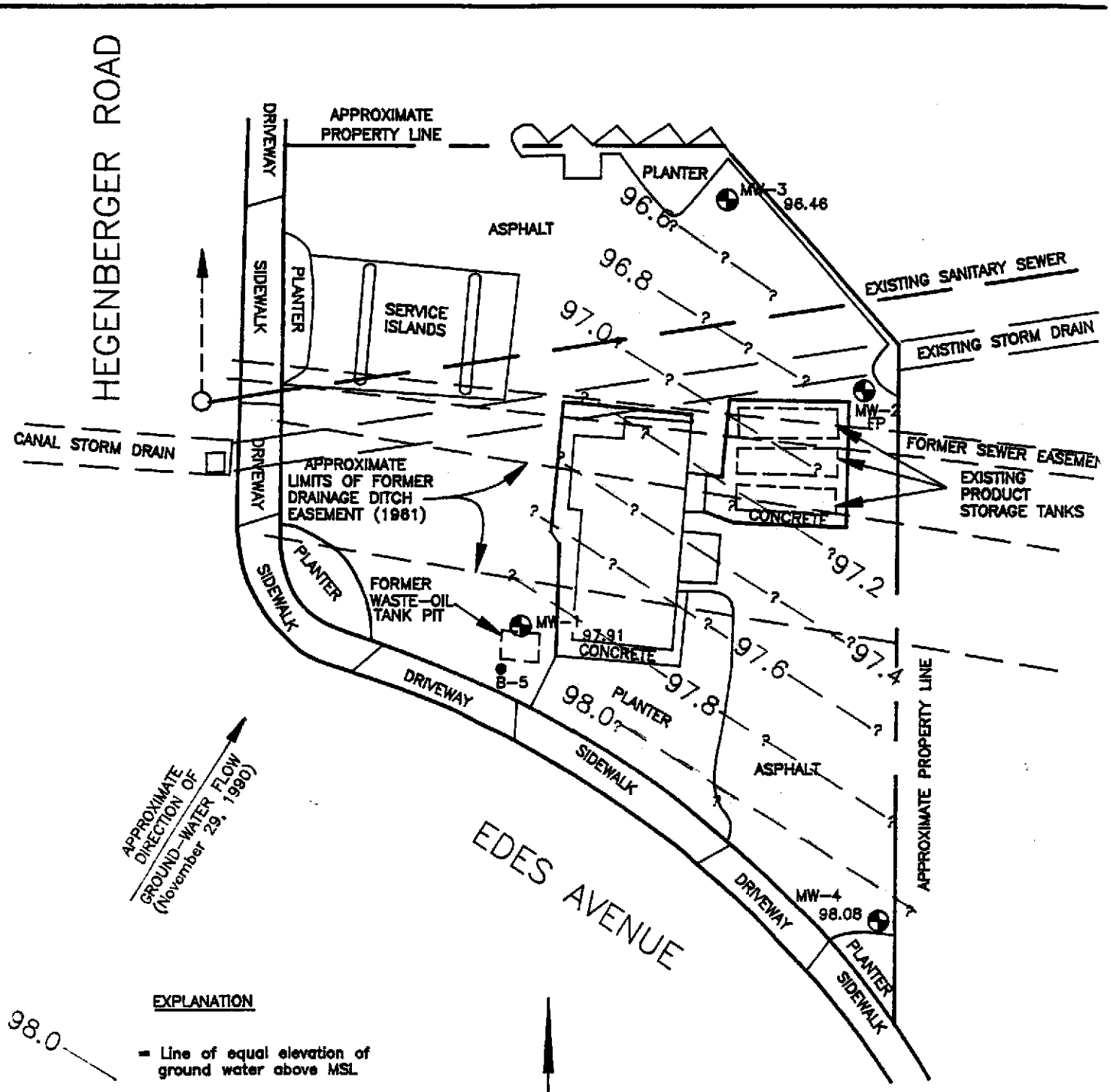
PROJECT 69038-2

GROUND-WATER GRADIENT MAP
November 20, 1990
ARCO Service Station 4494
566 Hegenberger Road
Oakland, California

PLATE 19



Source: Modified from plans supplied by ARCO Products Co. (dated August 12, 1982) and City of Oakland Dept. of Public Works (dated December 19, 1961).

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PROJECT 69038-2

GROUND-WATER GRADIENT MAP
November 29, 1990
ARCO Service Station 4494
566 Hegenberger Road
Oakland, California

PLATE 20

TABLE 1
CUMULATIVE GROUND-WATER MONITORING DATA
ARCO Station 4494
566 Hegenberger Road
Oakland, California

Well Date	Elevation of Wellhead	Depth to Water	Water Elevation	Product Evidence
MW-1				
06/06/90	105.31	6.65	98.66	None
08/16/90		7.00	98.31	None
08/21/90		7.05	98.26	None
09/07/90		7.24	98.07	None
11/20/90		7.46	97.85	None
11/29/90		7.40	97.91	None
MW-2				
06/06/90	105.78	9.00*	96.78*	11" of Black Product
08/16/90		NM	--.--	2" of Black Product
08/21/90		NM	--.--	2" of Black Product
09/07/90		9.17*	96.61*	2" of Black Product
11/20/90		9.20*	96.58*	Heavy Sheen
11/29/90		9.92*	95.86*	Heavy Sheen
MW-3				
08/16/90	105.51	8.87	96.64	None
08/21/90		8.85	96.66	None
09/07/90		8.98	96.53	None
11/20/90		9.10	96.41	None
11/29/90		9.05	96.46	None
MW-4				
08/16/90	106.61	8.16	98.45	None
08/21/90		8.22	98.39	None
09/07/90		8.39	98.22	None
11/20/90		8.57	98.04	None
11/29/90		8.53	98.08	None

Depth measurements in feet.
* = Floating Product present in well.
NM = Not measured.
Elevations in feet above mean sea level (plus one hundred feet to avoid negative ground-water elevations).

TABLE 2
RESULTS OF LABORATORY ANALYSIS OF SOIL SAMPLES
FOR HYDROCARBONS
ARCO Station 4494
Hegenberger Road and Edes Avenue
Oakland, California
(Page 1 of 2)

Sample Identifier	TPHg	TPHd	Benzene	Toluene	Ethyl-benzene	Total Xylenes	TOG
December 16, 1988 - Waste-Oil Tank Excavation							
WO-1	11.*	370.+**	NA	NA	NA	NA	4,500 (4,800)
WO-2	<5.*	<10.**	NA	NA	NA	NA	<20
January 4, 1989 - Excavation Sidewall Samples							
WOSW-E	NA	<10.**	NA	NA	NA	NA	190 (50)
WOSW-S	NA	<10.**	NA	NA	NA	NA	<10 (<10)
WOSW-W	NA	<10.**	NA	NA	NA	NA	<10 (<10)
WOSW-N	NA	33.**	NA	NA	NA	NA	200 (400)
January 18, 1989							
WOSW-N2	NA	<10.**	NA	NA	NA	NA	10 (<10)
October 1989							
S-5-B1	<1.0	200	<0.005	<0.005	<0.005	<0.005	1,600
S-10-B1	<1.0	<10	<0.005	<0.005	<0.005	<0.005	<30
S-20-B1	<1.0	<10	<0.005	<0.005	<0.005	<0.005	<30
S-5-B2	52	<10	1.8	0.25	0.48	2.6	280
S-11-B2	30	<10	0.75	0.51	0.43	2.7	<30
S-16-B2	52,000	5,700	<100	1,400	440	2,700	2,300
S-16-B2#	-----	----	(120)	(930)	(490)	(3,200)	----
S-19-B2	11	14	0.25	1.2	0.22	1.5	<30
S-21-B2	<1.0	<10	<0.005	0.012	<0.005	0.021	<30
S-24-B2	<1.0	<10	<0.005	<0.005	<0.005	<0.005	<30
S-5-B3	<2.0	<10	<0.050	<0.050	<0.050	<0.050	<50
S-20-B3	<2.0	<10	<0.050	<0.050	<0.050	<0.050	<50

See notes at the bottom of page 2 of 2.

TABLE 2
RESULTS OF LABORATORY ANALYSIS OF SOIL SAMPLES
FOR HYDROCARBONS
ARCO Station 4494
Hegenberger Road and Edes Avenue
Oakland, California
(Page 2 of 2)

Sample Identifier	TPHg	TPHd	Benzene	Toluene	Ethyl-benzene	Total Xylenes	TOG
August 1990							
S-7-B4	<2.0	36	<0.050	<0.050	<0.050	<0.050	110
S-10-B4	<2.0	<10	<0.050	<0.050	<0.050	<0.050	<50
S-19.5-B4	<2.0	15	<0.050	<0.050	<0.050	<0.050	<50
S-22-B4	NA	<10	NA	NA	NA	NA	NA
S-6-B5	<2.0	<10	<0.050	<0.050	<0.050	<0.050	<50
June 1990 - Composite Soil Sample (Borings B-1 and B-2)							Pb
SP-0619-1A SP-0619-1B SP-0619-1C SP-0619-1D	19	110	<0.050	<0.050	0.087	0.67	<0.5
August 1990 - Composite Soil Sample (Borings B-3 and B-4)							
S-B3-1 S-B3-2 S-B4-1 S-B4-2 S-B4-3	<2.0	<10	<0.050	<0.050	<0.050	<0.050	<0.5

Results in milligrams per kilogram (mg/kg), or parts per million (ppm).
TPHg: Total petroleum hydrocarbons as gasoline by EPA Method 8015/3050.
TPHd: Total petroleum hydrocarbons as diesel by EPA Method 8015/3550.
TOG: Total oil and grease by EPA Standard Method 503 A/E.
* : Analyzed as low boiling hydrocarbons as gasoline (LBHC-g).
** : Analyzed as high boiling hydrocarbons as diesel (HBHC-d).
(4,800): Analyzed as high boiling hydrocarbons as oil (HBHC-o).
+ : Chromatographic pattern of compounds detected and calculated as diesel does not match that of the diesel standard used for calibration.
# : Results of analysis by EPA Method 8240.
Benzene: 120 ppm Toluene: 930 ppm Ethylbenzene: 490 ppm Total Xylenes: 3,200 ppm
Naphthalene: 11 ppm 2-Methylnaphthalene: 6 ppm
Di-n-Octyl Phthalate: 0.60 ppm Butylbenzylphthalate: 0.77 ppm
Pb: Organic Lead by EPA Method 7420.
Sample Identification:
S-22-B4
Boring number
Approximate sample depth in feet
Soil sample SP = soil sample from Stock Pile

TABLE 3
RESULTS OF LABORATORY ANALYSIS OF SOIL SAMPLES
FOR METALS
ARCO Station 4494
Hegenberger Road and Edes Avenue
Oakland, California

Sample Identifier	VOCs	Total Cadmium	Total Chromium	Total Lead	Total Zinc
S-5-B1	NA	<0.5	46.8	29.8	67.3
S-10-B1	NA	<0.5	31.2	<1.0	48.5
S-20-B1	NA	<0.5	39.2	<1.0	62.5
S-24-B1	NA	0.757	48.2	<1.0	81.5
S-5-B2	NA	<0.5	32.4	19.9	64.1
S-11-B2	NA	<0.5	22.4	2.16	33.4
S-16-B2	NA	<0.5	27.6	10.2	43.3
S-19-B2	NA	<0.5	40.6	<1.0	60.1
S-21-B2	NA	<0.5	51.2	<1.0	126
S-5-B3	NA	1.1	49	66	48
S-20-B3	NA	2.1	55	79	45
S-7-B4	NA	4.8	85	170	31
S-10-B4	NA	2.7	63	88	44
S-19.5-B4	NA	2.3	66	94	52
S-6-B5	ND	3.4	58	84	41
TTLC		**100**	**2,500**	**1,000**	**5,000**

Results in milligrams per kilogram (mg/kg), or parts per million (ppm).
NA: Not analyzed.
ND: Below the detection limit; see laboratory data sheets for detection limits.
TTLC: Total Threshold Limit Concentration values (Title 22 of California Administrative Code, January 1988).

Sample Identification:

Boring number
Approximate sample depth in feet
Soil sample

TABLE 4
RESULTS OF LABORATORY ANALYSIS OF WATER SAMPLES
ARCO Station 4494
Hegenberger Road and Edes Avenue
Oakland, California

Well Date	TPHg	TPHd	Benzene	Toluene	Ethyl-benzene	Total Xylenes	TOG
MW-1							
06/19/90	<50	<100	<0.50	<0.50	<0.50	<0.50	<5000
08/16/90	<20	NA	<0.50	<0.50	<0.50	<0.50	NA
09/07/90	NA	NA	NA	NA	NA	NA	<5000
MW-3							
08/16/90	<20	<100	<0.50	<0.50	<0.50	<0.50	NA
09/07/90	NA	NA	NA	NA	NA	NA	<5000
MW-4							
08/16/90	<20	<100	<0.50	<0.50	<0.50	<0.50	NA
09/07/90	NA	NA	NA	NA	NA	NA	<5000

Results in micrograms per liter (ug/l), or parts per billion (ppb).
TPHg: Total petroleum hydrocarbons as gasoline.
TPHd: Total petroleum hydrocarbons as diesel.
TOG: Total oil and grease.
NA: Not Analyzed.

TABLE 5
RESULTS OF LABORATORY ANALYSIS OF WATER SAMPLES
ARCO Station 4494
Hegenberger Road and Edes Avenue
Oakland, California

Well Date	BNAs	VOCs	Total Cadmium	Total Chromium	Total Organic Lead	Total Zinc
MW-1						
06/19/90	ND	ND	0.024	<0.05	0.10	0.049
08/16/90	NA	NA	NA	NA	NA	NA
MW-3						
08/16/90	ND	ND	<0.01	0.06	0.07	0.07
MW-4						
08/16/90	ND	ND	<0.01	<0.02	<0.02	0.03
MCLs	—	—	**0.010**	**0.05**	**0.05**	**NR**

Results in milligrams per liter (mg/l), or parts per million (ppm).
NA: Not Analyzed.
ND: Below the detection limit; see laboratory data sheets for detection limits.

MCLs: Maximum Contaminant Levels (California Department of Health Services, Office of Drinking Water, October 1990).
NR: No established DWAL or MCL.

APPENDIX A

Previous Environmental Work

PREVIOUS ENVIRONMENTAL WORK

December 1988 to January 1989

An initial environmental investigation at the site was conducted by Pacific Environmental Group (Pacific) of Santa Clara, California, and Crosby & Overton, Inc. (C&O) of Oakland, California, during December 1988 and January 1989. This work consisted of the removal of a 280-gallon waste-oil tank, collection of soil samples for laboratory analyses, and removal of stockpiled soil to a Class I hazardous waste facility by C&O. Pacific reported that the tank showed no signs of leakage, but a strong product odor was noted in the soil beneath the tank. The tank pit was excavated to a depth of 7 feet below grade. Pacific collected a soil sample (WO-1) at this depth (two feet below the bottom of the former waste-oil tank) beneath the fill end of the tank. Pacific also collected a soil sample (WO-2) at a depth of 10 feet below grade directly beneath the location of sample WO-1. The soil samples were analyzed for: (1) total oil and grease (TOG), (2) high boiling point hydrocarbons (HBPH) (calculated as oil and diesel), (3) semi-volatile organic compounds, (4) volatile organic compounds (VOCs), and (5) cadmium, chromium, lead, and zinc at International Technology Corporation (State-certified Hazardous Materials testing laboratory No. 137) in San Jose, California.

Soil sample WO-1, collected at a depth of 7 feet, indicated 4,500 parts per million (ppm) TOG, 4,800 ppm HBPH (calculated as oil), and 370 ppm HBPH (calculated as diesel), respectively. Soil sample WO-2, collected at a depth of 10 feet, indicated nondetectable levels (less than 20 ppm) TOG, nondetectable levels (less than 10 ppm) HBPH (calculated as oil), and nondetectable levels (less than 10 ppm) HBPH (calculated as diesel), respectively.

On January 4, 1989, the pit was further excavated to a depth of 10 feet below grade where Pacific reported no noticeable hydrocarbon odor in the soil. Four sidewall soil samples (WOSW-N, WOSW-E, WOSW-S, and WOSW-W) were collected at a depth of 7 feet from the enlarged excavation. Results of laboratory analysis of these samples indicated:

(1) levels of TOG at 200 ppm, 190 ppm, < 10 ppm, and < 10 ppm, respectively;
(2) HBPH (calculated as oil) at 400 ppm, 50 ppm, < 10 ppm, and < 10 ppm, respectively;
(3) HBPH (calculated as diesel) at 33 ppm, < 10 ppm, < 10 ppm, and < 10 ppm, respectively.

On January 18, 1989, the waste-oil tank excavation was extended 3-1/2 feet on the north side to remove hydrocarbon contamination beyond sidewall sample WOSW-N. Additional excavation of the eastern wall was not possible because of the wall's proximity to the station

building. Sidewall sample WOSW-N2 was obtained from the north wall of the extended pit at an approximate depth of 7 feet. Results of laboratory analysis of this sample indicated 10 ppm TOG, <10 ppm HBPH (calculated as diesel), and <10 ppm HBPH (calculated as oil) (Pacific, 1989).

October 1990

An environmental records search was performed by Applied GeoSystems within an approximately 1/2-mile radius of the site using information supplied by ARCO, Alameda County Flood Control and Water Conservation District (Zone 7), and the California Department of Water Resources (DWR) (Applied GeoSystems, September 1990). Presented below is a summary of our findings.

- Before its development, the subject property was covered by a sparse growth of native weeds, and was situated on reclaimed tidal marshlands covered by approximately four feet of artificial fill. The fill material was described as heterogeneous sandy gravelly clay containing construction debris, including pieces of concrete, asphalt, and metallic slag. The source of the construction debris was not noted. Below the fill material, the marshland soil was described as firm to soft organic silty clay (Bay Mud) containing thin lenses of silty sand and gravel (Soil Mechanics and Foundation Engineers (SMFE), 1968).

- The site contains a buried slough crossing the southern side of the site near the corner of Hegenberger Road and Edes Avenue (SMFE, 1968). This slough was channelized at some time in the past, and the modified channel is approximately located on Plate 2.

- Three sewer lines were reported by SMFE in 1968 to cross the central portion of the property in a northeast-southwest direction, including a 72-inch-diameter storm-sewer drain, a 48-inch-diameter sanitary sewer, and a 39-inch-diameter abandoned sewer pipeline. Approximate locations of these sewer lines are shown on Plate 2.

- The site is surrounded (within 1/2-mile radius) by various industrial facilities which may at one time have been interconnected with the subject property by surface water drainage channels. Two gasoline service stations and several industrial facilities, which currently use or have historically used underground storage tanks for fuels and solvents are located within a 1/2-mile radius of the site.

- Several facilities in the site area are under investigation for soil and ground-water contamination, including solvents, metals, and petroleum hydrocarbons. These facilities are concentrated in the light industrial sector bounded by Baldwin Avenue,

85th Avenue, and Enterprise Drive, and the heavy industrial areas located along the railroad tracks. These facilities include Ran Rob Tool and Die and West Coast Wire Rope and Rigging east and southeast of the site, and the Transamerica Delaval facility south of the site.

- Numerous facilities in the site area have used underground storage tanks for storage of fuels and solvents, many of which were removed in the 1970's and early 1980's when there were few requirements for testing of soil and ground water during underground storage tank removals. These facilities include several immediately surrounding the site, including the Shell gasoline station to the south; the GMC truck dealership, Castle Golf and Games miniature golf course and predecessor the Malibu Grand Prix racetrack, and Digas gasoline station to the west; Alta Freight, Beava Chemical Company, Conspec Roofing, Golden Gate Freight Lines, and Ran Bob Tool and Die facilities in the light industrial sector to the east and southeast; and former Chevron gasoline station and Transamerica Delaval facility to the south.

ALAMEDA COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT

5997 PARKSIDE DRIVE ♦ PLEASANTON, CALIFORNIA 94566 ♦ (415) 484-2600

GROUNDWATER PROTECTION ORDINANCE PERMIT APPLICATION

FOR APPLICANT TO COMPLETE

(1) LOCATION OF PROJECT 566 Hegenberger Rd
Oakland, California

(2) CLIENT
Name ARCO Products Company
Address P.O. Box 5811 Phone (415) 571-2434
City San Mateo Zip 94403

(3) APPLICANT
Name Applied GeoSystems
3315 Almaden Expressway
Address Suite 34 Phone (408) 264-7723
City San Jose Zip 95118

(4) DESCRIPTION OF PROJECT

Water Well Construction	✓	Geotechnical Investigation	
Cathodic Protection		General	
Well Destruction		Contamination	

(5) PROPOSED WATER WELL USE

Domestic		Industrial		Irrigation	
Municipal		Monitoring	✓	Other	

(6) PROPOSED CONSTRUCTION
Drilling Method:
Mud Rotary ____ Air Rotary ____ Auger ✓
Cable ____ Other ____

DRILLER'S LICENSE NO. C57# 384167

WELL PROJECTS 3 wells

Drill Hole Diameter	10 or 2 in.	Maximum Depth	30 ft.
Casing Diameter	4 in.		
Surface Seal Depth	* ft.	Number	3

GEOTECHNICAL PROJECTS

Number of Borings		Maximum Depth	ft.
Hole Diameter	in.		

(7) ESTIMATED STARTING DATE 10-30-89
ESTIMATED COMPLETION DATE 10-31-89

(8) I hereby agree to comply with all requirements of this permit and Alameda County Ordinance No. 73-68.

APPLICANT'S SIGNATURE Willie R. Dugan Date 10/25/89

FOR OFFICE USE

PERMIT NUMBER 89624
LOCATION NUMBER

PERMIT CONDITIONS

Circled Permit Requirements Apply

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

(B.) WATER WELLS, INCLUDING PIEZOMETERS
1. Minimum surface seal thickness is two inc cement grout placed by tremie.
2. Minimum seal depth is 50 feet for municip Industrial wells or 20 feet for domestic, i tion, and monitoring wells unless a lesser is specially approved.

C. GEOTECHNICAL. Backfill bore hole with compacte tings or heavy bentonite and upper two feet wit pacted material. In areas of known or sus contamination, tremied cement grout shall be u place of compacted cuttings.

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

E. WELL DESTRUCTION. See attached.

* 10 feet surface seal depending depth to as discussed with Applied GeoSystems re sentative Bill Dugan.

Approved Wyman Hong Date 25 Oc
Wyman Hong

APPENDIX C

Field Methods

FIELD METHODS

Site Safety Plan

Field work performed by Applied GeoSystems at the site on behalf of ARCO was conducted in accordance with the Applied GeoSystems Site Safety Plan, No. 68038-2S, dated October 27, 1989. The Site Safety Plan describes the safety requirements for the evaluation of waste-oil and gasoline hydrocarbons in soil and ground water at the site. The site Safety Plan is applicable to personnel of Applied GeoSystems and its subcontractors. Applied GeoSystems personnel and subcontractors of Applied GeoSystems scheduled to perform the work at the site are briefed on the contents of the Site Safety Plan before work begins. A copy of the Site Safety Plan is available for reference by appropriate parties during the work. A site Safety Officer is assigned to the project.

Soil Borings

Prior to the drilling of borings and construction of monitoring wells, permits are acquired from the Alameda County Flood Control and Water Conservation District (Zone 7). Copies of the permits are included in Appendix B of this report. Prior to drilling, Underground Services Alert is notified of our intent to drill, and known underground utility lines and structures are approximately marked.

The borings are drilled by a truck-mounted drill rig equipped with 10-inch-diameter, hollow-stem augers. The augers are steam-cleaned prior to drilling each boring to minimize the possibility of cross-contamination. After drilling the borings, monitoring wells are constructed in the borings, or neat-cement grout with bentonite is used to backfill the borings to the ground surface.

Borings for ground-water monitoring wells are drilled to a depth of no more than 20 feet below the depth at which a saturated zone is first encountered, or a short distance into a stratum beneath the saturated zone which is of sufficient moisture and consistency to be judged as a perching layer by the field geologist, whichever is shallower. Drilling into a deeper aquifer below the shallowest aquifer is begun only after a conductor casing is properly installed and allowed to set, to seal the shallow aquifer.

Drill Cuttings

Drill cuttings subjectively evaluated as containing hydrocarbons at levels greater than 100 parts per million (ppm) are separated from those subjectively evaluated as containing hydrocarbons at levels less than 100 ppm. Evaluation is based either on subjective evidence of soil discoloration, or on measurements made using a field calibrated OVM. Readings are taken by placing a soil sample into a ziplock-type plastic bag and allowing volatilization to occur. The intake probe of the OVM is then inserted into the headspace created in the plastic bag immediately after opening it.

Drill cuttings generated from borings B-1 and B-2 were stockpiled on and covered by plastic sheets. Based on the results of laboratory testing of a composite sample (SP-0619-1A,-1B, -1C,-1D) collected from the stockpile on June 19, 1990, Dillard Trucking, of Byron, California, removed approximately one cubic yard of soil generated from the soil borings. This soil was transported to the Liquid Waste Management facility in McKittrick, California, a Class II landfill, on July 6, 1990. A copy of the Non-Hazardous Waste Data Form is included in Appendix E.

Drill cuttings generated from borings B-3 through B-5 were placed in five labeled 55-gallon drums approved by the Department of Transportation. Based on the results of laboratory testing of a composite sample (S-B3-1[-2] and S-B4-1[-2,-3]) from the drummed soil on August 16, 1990, Armour Petroleum Service Corporation, of Fairfield, California, removed approximately one cubic yard of soil generated from the soil borings. This soil was transported to Redwood Sanitary Landfill in Novato, California, a Class III landfill, on September 17, 1990.

Soil Sampling in Borings

Soil samples are collected at no greater than 5-foot intervals from the ground surface to the total depth of the borings. The soil samples are collected by advancing the boring to a point immediately above the sampling depth, and then driving a California-modified, split-spoon sampler containing brass sleeves through the hollow center of the auger into the soil. The sampler and brass sleeves are laboratory-cleaned, steam-cleaned, or washed thoroughly with Alconox® and water, prior to each use. The sampler is driven with a standard 140-pound hammer repeatedly dropped 30 inches. The number of blows to drive the sampler each successive six inches are counted and recorded to evaluate the relative consistency of the soil.

The samples selected for laboratory analysis are removed from the sampler and quickly sealed in their brass sleeves with aluminum foil, plastic caps, and aluminized duct tape. The samples are then labeled, promptly placed in iced storage, and delivered to a laboratory certified by the State of California to perform the analyses requested.

One of the samples in brass sleeves not selected for laboratory analysis at each sampling interval is tested in the field using an OVM that is field calibrated at the beginning of each day it is used. This testing is performed by inserting the intake probe of the OVM into the headspace in the plastic bag containing the soil sample as described in the Drill Cuttings section above. The OVM readings are presented in Logs of Borings included in the project report.

Logging of Borings

A geologist is present to log the soil cuttings and samples using the Unified Soil Classification System. Samples not selected for chemical analysis, and the soil in the sampler shoe, are extruded in the field for inspection. Logs include texture, color, moisture, plasticity, consistency, blow counts, and any other characteristics noted. Logs also include subjective evidence for the presence of hydrocarbons, such as soil staining, noticeable or obvious product odor, and OVM readings.

Monitoring Well Construction

Monitoring wells are constructed in selected borings using clean 4-inch-diameter, thread-jointed, Schedule 40 polyvinyl chloride (PVC) casing. No chemical cements, glues, or solvents are used in well construction. Each casing bottom is sealed with a threaded end-plug, and each casing top with a locking plug. The screened portions of the wells are constructed of machine-slotted PVC casing with 0.010- or 0.020-inch-wide slots for initial site wells. Slot size for subsequent wells may be based on sieve analysis and/or well development data. The screened sections in ground-water monitoring wells are placed to allow monitoring during seasonal fluctuations of ground-water levels.

The annular space of each well is backfilled with No. 2 by 12 sand, or No. 3 sand, to approximately two feet above the top of the screened casing for initial site wells. The sand pack grain size for subsequent wells may be based on sieve analysis and/or well development data. A 1- to 2-foot-thick bentonite plug is placed above the sand as a seal

against cement entering the filter pack. The remaining annulus is then backfilled with a slurry of water, neat cement, and bentonite to approximately one foot below the ground surface.

An aluminum utility box with a PVC apron is placed over each wellhead and set in concrete placed flush with the surrounding ground surface. Each wellhead cover has a seal to protect the monitoring well against surface-water infiltration and requires a special wrench to open. The design discourages vandalism and reduces the possibility of accidental disturbance of the well.

Ground-Water Monitoring Well Development

The monitoring wells are developed by bailing or over-pumping and surge-block techniques. The wells are either bailed or pumped, allowed to recharge, and bailed or pumped again until the water removed from the wells is determined to be clear. Turbidity measurements (in NTUs) are recorded during well development and are used in evaluating well development. The development method used, initial turbidity measurement, volume of water removed, final turbidity measurement, and other pertinent field data and observations are recorded. The wells are allowed to equilibrate for at least 48 hours after development prior to sampling. Water generated by well development is stored in 17E Department of Transportation (DOT) 55-gallon drums on site. Based on the results of laboratory testing of water samples collected from the wells on September 7, 1990, Armour Petroleum Service Corporation, of Fairfield, California, removed approximately 200 gallons of water generated from purging the wells. This water was transported to Armour Petroleum's TSD facility in Solano County, California, on September 17, 1990.

Ground-Water Sampling

The static water level in each well is measured to the nearest 0.01-foot using a Solinst® electric water-level sounder or oil/water interface probe (if the wells contain floating product) cleaned with Alconox® and water before use in each well. The liquid in the wells is examined for visual evidence of hydrocarbons by gently lowering approximately half the length of a Teflon® bailer (cleaned with Alconox® and water) past the air/water interface. The sample is then retrieved and inspected for floating product, sheen, emulsion, color, and clarity. If floating product is present in the well, the thickness of floating product is measured using an oil/water interface probe and is recorded to the nearest 0.01 foot. Floating product is removed from wells on site visits.

Wells which do not contain floating product are purged using a submersible pump. The pump, cables, and hoses are cleaned with Alconox® and water prior to use in each well. The wells are purged until withdrawal is of sufficient duration to result in stabilized pH, temperature, and electrical conductivity of the water, as measured using portable meters calibrated to a standard buffer and conductivity standard. If the well becomes dewatered, the water level is allowed to recover to at least 80 percent of the initial water level. Prior to the collection of each ground water sample, the Teflon® bailer is cleaned with Alconox® and rinsed with tap water and deionized water, and the latex gloves worn by the sampler changed. Hydrochloric acid is added to the sample vials as a preservative (when applicable). A sample method blank is collected by pouring distilled water into the bailer and then into sample vials. A sample of the formation water is then collected from the surface of the water in each of the wells using the Teflon® bailer. The water samples are then gently poured into laboratory-cleaned, 40-milliliter (ml) glass vials, 500 ml plastic bottles or 1-liter glass bottles (as required for specific laboratory analysis) and sealed with Teflon®-lined caps, and inspected for air bubbles to check for headspace, which would allow volatilization to occur. The samples are then labeled and promptly placed in iced storage. A field log of well evacuation procedures and parameter monitoring is maintained. Water generated by the purging of wells is stored in 17E DOT 55-gallon drums, and floating product bailed from the wells is stored in double containment onsite; this water and product remains the responsibility of the client.

Sample Labeling and Handling

Sample containers are labeled in the field with the job number, sample location and depth, and date, and promptly placed in iced storage for transport to the laboratory. A Chain of Custody Record is initiated by the field geologist and updated throughout handling of the samples, and accompanies the samples to a laboratory certified by the State of California for the analyses requested. Samples are transported to the laboratory promptly to help ensure that recommended sample holding times are not exceeded. Samples are properly disposed of after their useful life has expired.

WELL PURGE DATA SHEET

Project Name: Arco 4494 Job No. 69038-2

Date: 8/16/90 Page 1 of 1

Well No. MW-1 Time Started 12:50

Time (hr)	Gallons (cum.)	Temp. (F)	pH	Conduct. (micromoh)	Turbidity (NTU)
12:50	Start purging MW-1				
13:08	12	70.6	8.50	11,940	64.9
13:15	17	70.4	9.04	12,230	181.3
13:20	22	70.0	9.17	12,590	>200
13:28	29	70.0	9.23	12,650	>200
13:40	35	Well dry, water level ≈ 22', stop pumping			
14:07	Resume pumping, Water level recorded to 8.0'				
14:11	37	71.1	8.70	12,010	37.8
14:18	43	70.8	8.64	11,960	35.9
14:23	47	71.0	8.51	11,960	33.1
14:34	55	70.7	8.55	11,920	36.2
14:45	64	71.2	8.51	11,980	42.0
14:50	68	71.0	8.53	12,010	39.2
16:20	Sample well, water level = 7.21'				13.4

Notes:

Depth to Bottom (feet) :	23.38
Depth to Water - initial (feet) :	7.00
Depth to Water - final (feet) :	7.21
% recovery :	98.9%
Time Sampled :	16:20
Dissolved Oxygen - initial (ppm) :	NA
Dissolved Oxygen - final (ppm) :	NA
Gallons per Well Casing Volume :	10.65
Gallons Purged :	68.0
Well Casing Volumes Purged :	6.38
Approximate Pumping Rate (gpm) :	0.35

WELL PURGE DATA SHEET

Project Name: Arco 4494 Job No. 69038-2

Date: 8/16/90 Page 1 of 1

Well No. MW-3 Time Started 17:30

Time (hr)	Gallons (cum.)	Temp. (F)	pH	Conduct. (micromoh)	Turbidity (NTU)
17:30	Begin Purging MW-3				
18:15	32	70.2		10,870	102.4
18:35	43	70.1		10,860	50.0
18:48	55	69.8		10,860	47.2
18:55	60	70.4		10,850	43.2
19:02	65	70.5		10,860	41.8
19:10	71	70.6		10,860	47.3
	Stop purging well				
	Sample well, Water level = 9.44				106.3

Notes:

Depth to Bottom (feet) :	18.10
Depth to Water - initial (feet) :	8.87
Depth to Water - final (feet) :	9.44
% recovery :	93.8%
Time Sampled :	20:00
Dissolved Oxygen - initial (ppm) :	NA
Dissolved Oxygen - final (ppm) :	NA
Gallons per Well Casing Volume :	6.0
Gallons Purged :	71.0
Well Casing Volumes Purged :	11.8
Approximate Pumping Rate (gpm) :	0.71

WELL PURGE DATA SHEET

Project Name: Arco 4494 Job No. 69038-2

Date: 8/16/90 Page 1 of 1

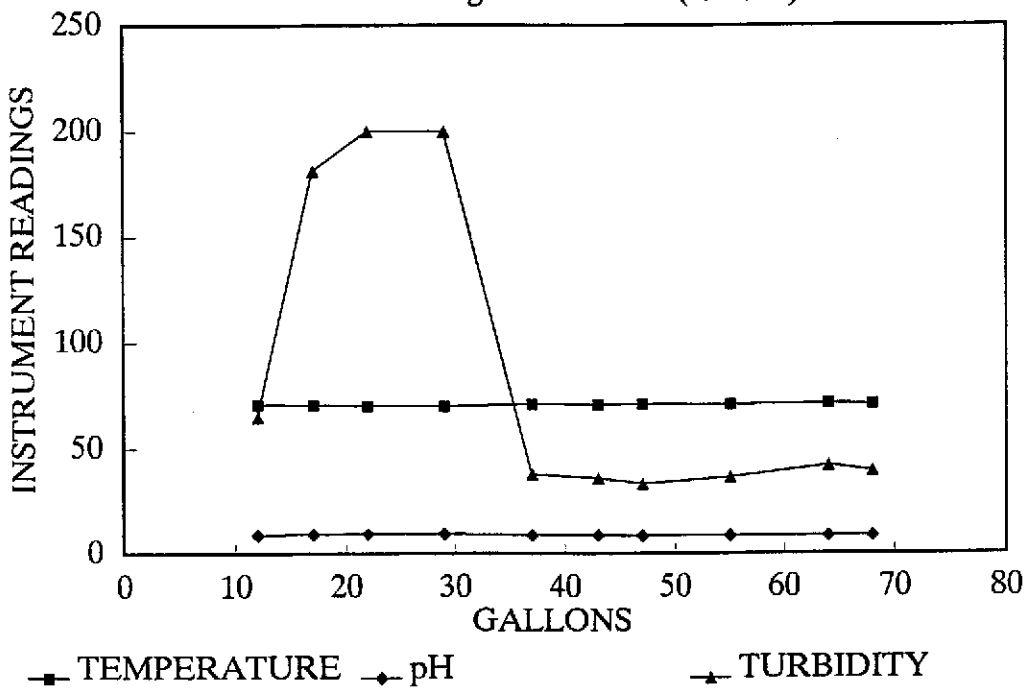
Well No. MW-4 Time Started 15:10

Time (hr)	Gallons (cum.)	Temp. (F)	pH	Conduct. (micromoh)	Turbidity (NTU)
15:10	Begin purging MW-4				
15:45	20	71.0	8.23	10,800	>200
15:55	27	71.3	8.61	11,420	>200
15:57	28	Well dry, water level ≈ 16'			
16:35	Begin purging, water level ≈ 9.5'				
16:48	37	70.5	9.10	11,720	>200
16:55	41	70.3	9.08	11,800	>200
17:01	46	70.3	9.01	11,860	>200
17:15	55	70.0	8.92	11,870	>200
	Stop purging MW-4, water level = 8.94'				67.9

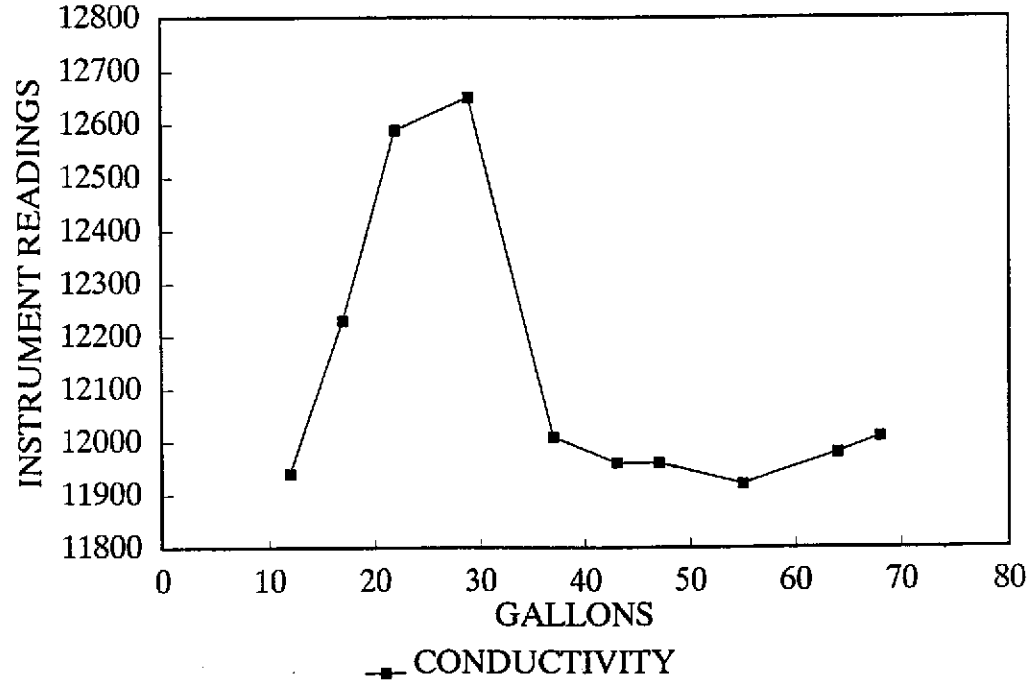
Notes:

Depth to Bottom (feet) :	18.23
Depth to Water - initial (feet) :	8.16
Depth to Water - final (feet) :	8.99
% recovery :	91.8%
Time Sampled :	18:10
Dissolved Oxygen - initial (ppm) :	NA
Dissolved Oxygen - final (ppm) :	NA
Gallons per Well Casing Volume :	6.54
Gallons Purged :	55.0
Well Casing Volumes Purged :	8.46
Approximate Pumping Rate (gpm) :	0.63

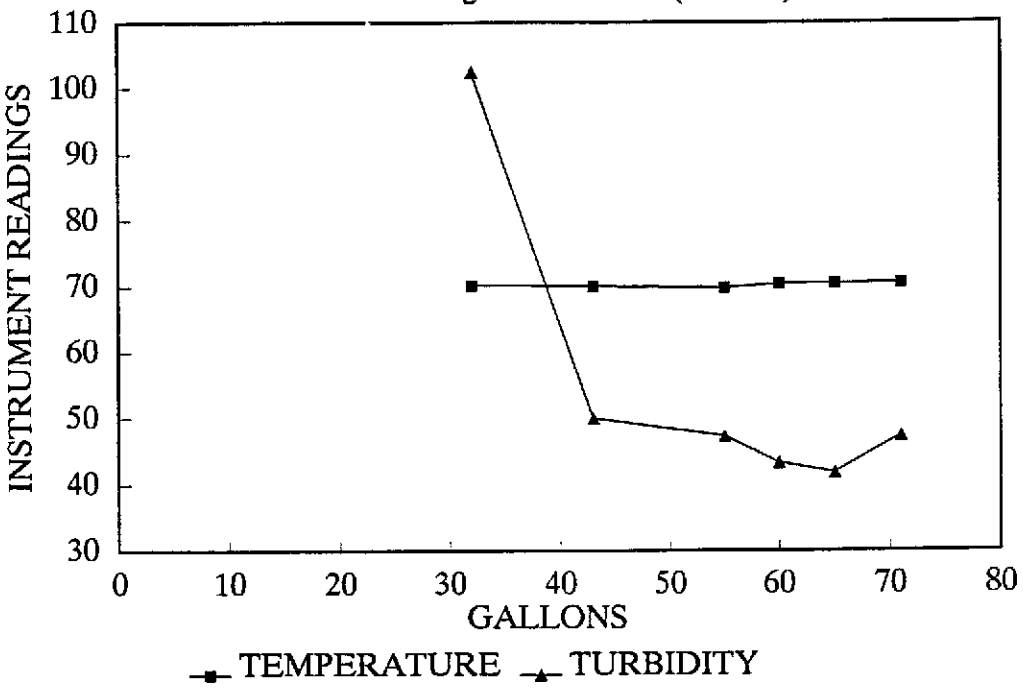
ARCO 4494 STABILIZATION GRAPH
Monitoring Well MW–1 (8/16/90)



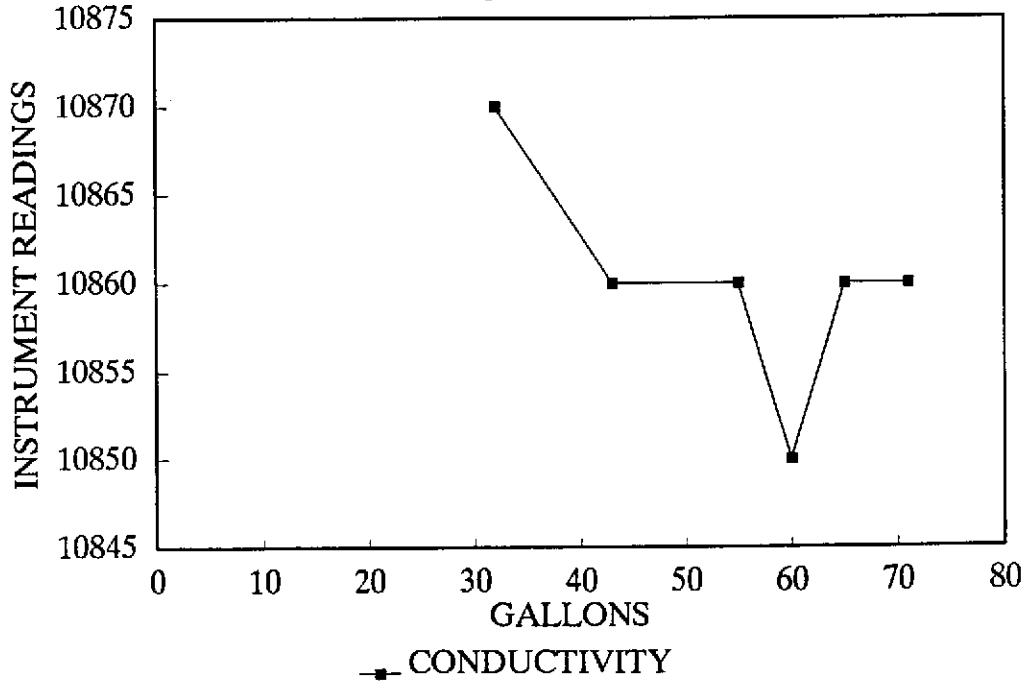
ARCO 4494 STABILIZATION GRAPH
Monitoring Well MW–1 (8/16/90)

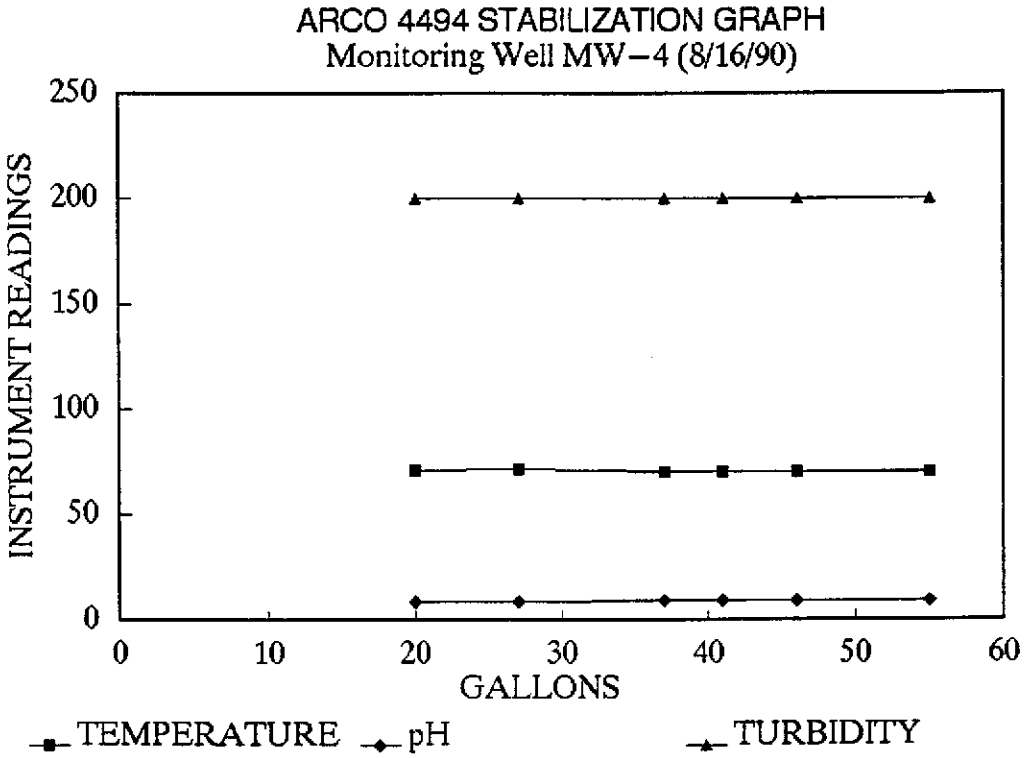


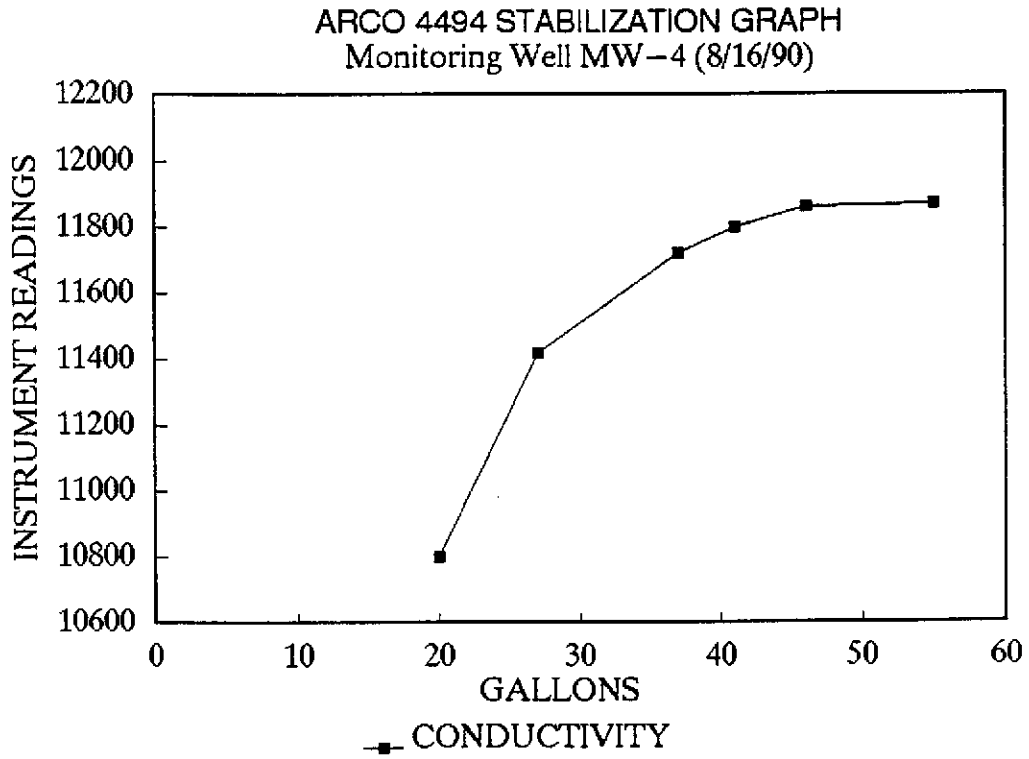
ARCO 4494 STABILIZATION GRAPH
Monitoring Well MW-3 (8/16/90)



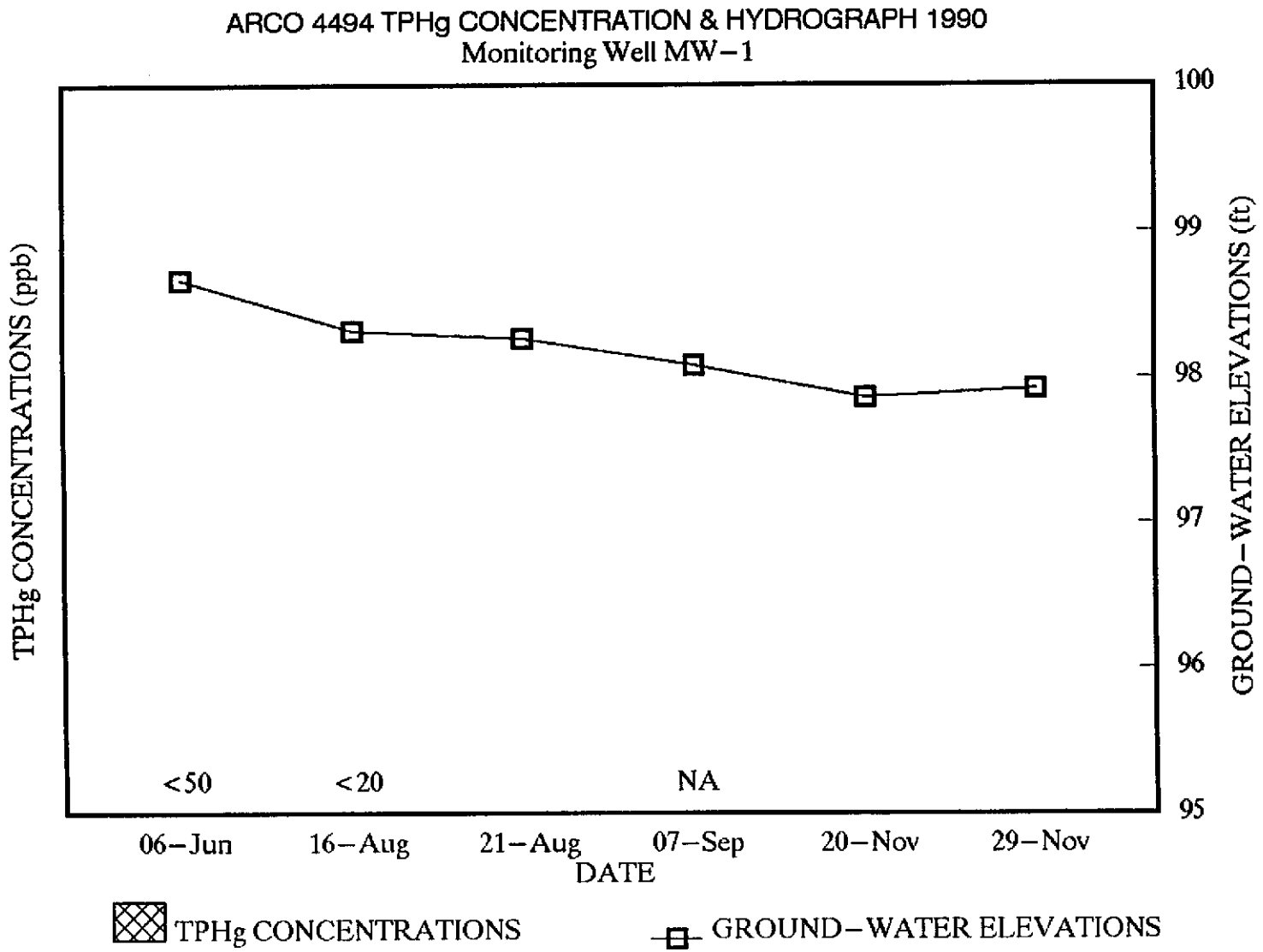
ARCO 4494 STABILIZATION GRAPH
Monitoring Well MW-3 (8/16/90)



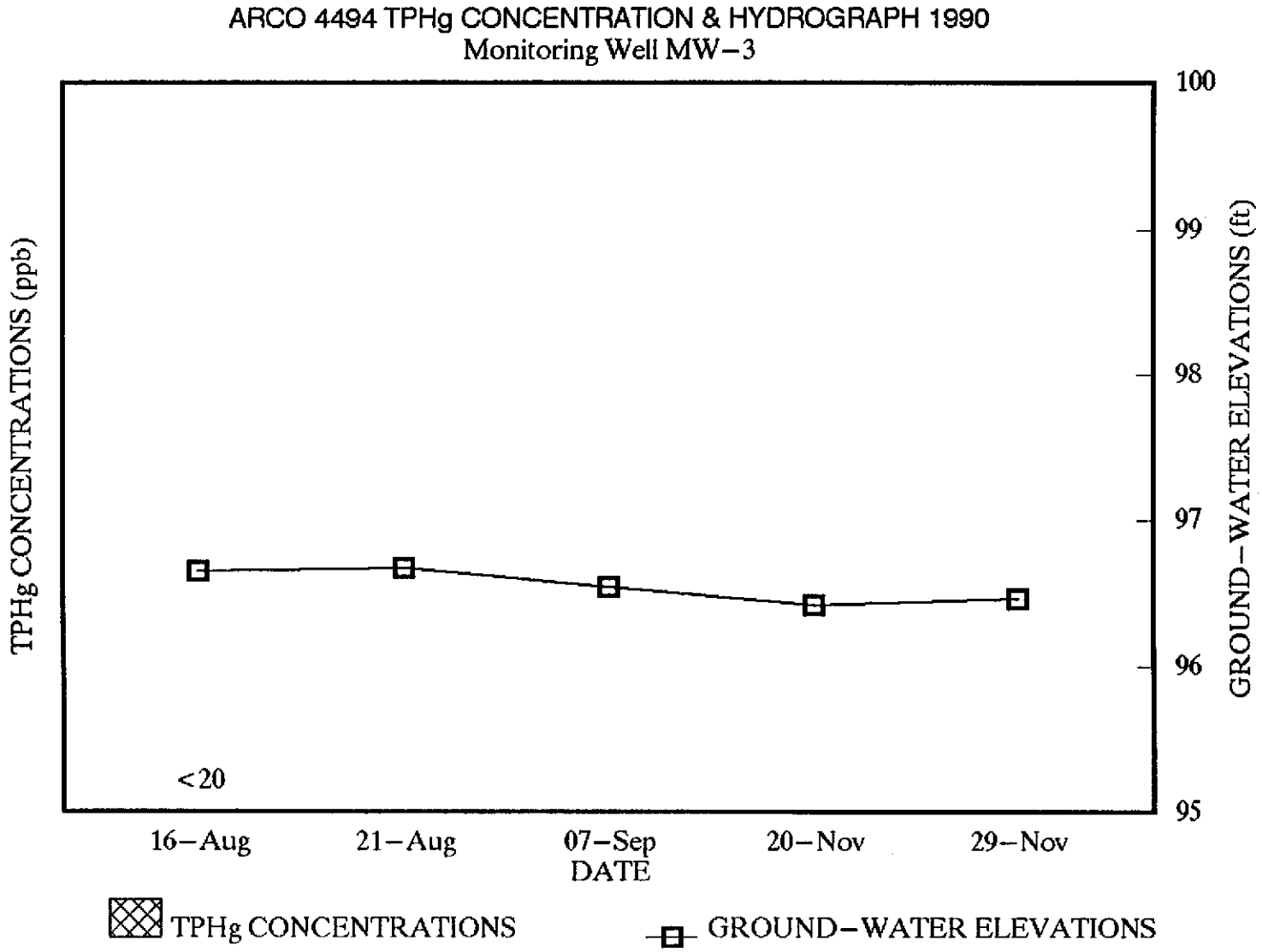

ARCO 4494 STABILIZATION GRAPH
Monitoring Well MW-4 (8/16/90)
INSTRUMENT READINGS
250
200
150
100
50
0
0
10
20
30
40
50
60
GALLONS
TEMPERATURE
pH
TURBIDITY


ARCO 4494 STABILIZATION GRAPH
Monitoring Well MW-4 (8/16/90)
INSTRUMENT READINGS
12200
12000
11800
11600
11400
11200
11000
10800
10600
0
10
20
30
40
50
60
GALLONS
CONDUCTIVITY

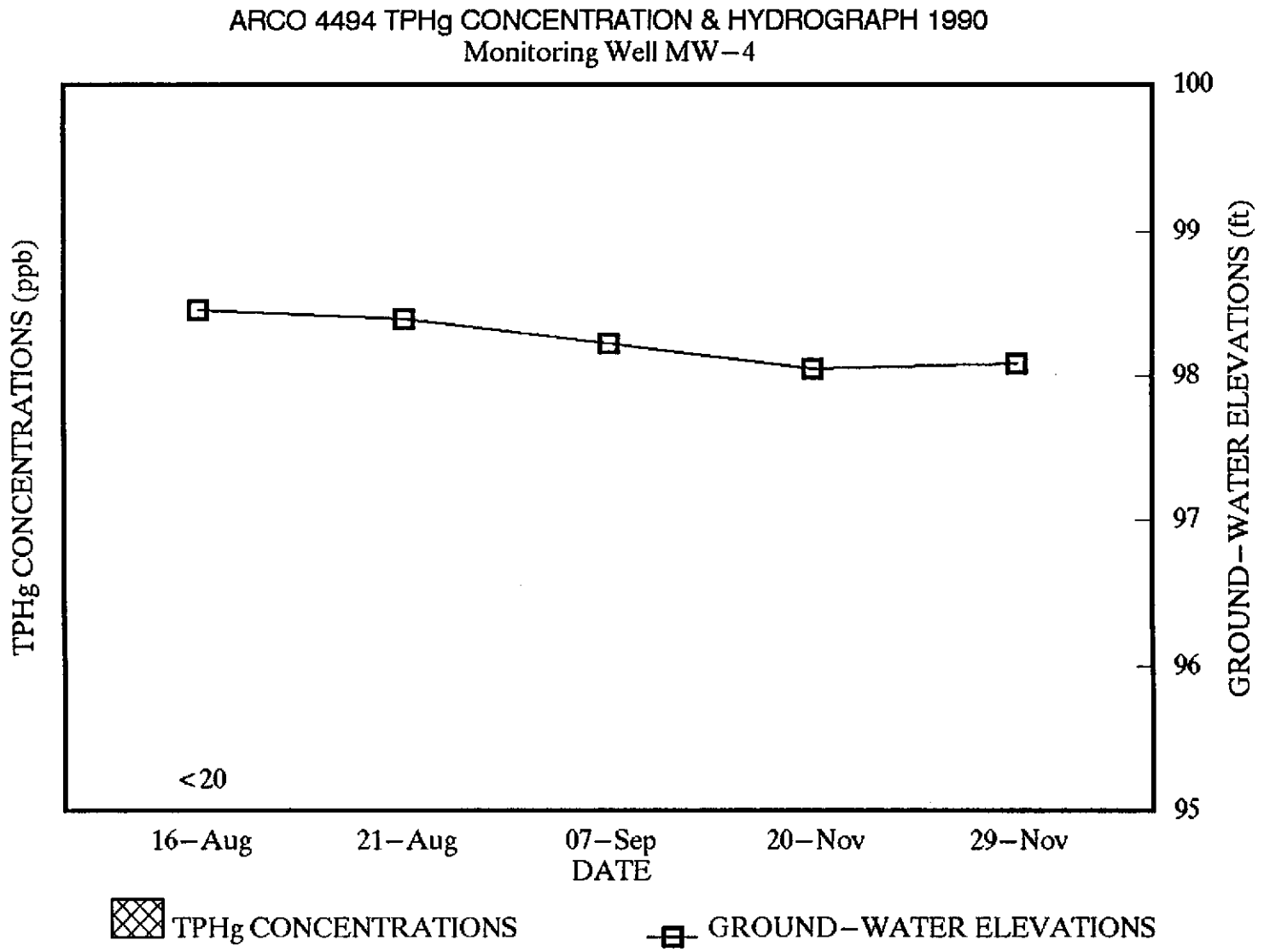
Applied GeoSystems



Applied GeoSystems



Applied GeoSystems



APPENDIX D

Wellhead Survey

RON ARCHER
CIVIL ENGINEER, INC.

CONSULTING • PLANNING • DESIGN • SURVEYING

4133 Mohr Ave., Suite E • Pleasanton, CA 94566
(415) 462-9372

REGISTERED PROFESSIONAL ENGINEER
RONALD R. ARCHER
No. 23721
EXP. 12/31/93
CIVIL
STATE OF CALIFORNIA

AUGUST 19, 1989

JOB NO. 1715

ELEVATIONS OF EXISTING MONITOR WELLS LOCATED AT ARCO SERVICE STATION NO. 4494 LOCATED AT 566 HEGENBERGER ROAD AT THE INTERSECTION OF EDES AVENUE, CITY OF OAKLAND, ALAMEDA COUNTY, CALIFORNIA.

FOR: APPLIED GEOSYSTEMS.
PROJECT NO. 69038-2

BENCHMARK: TOP OF CURB ON THE NOSE OF A TRAFFIC ISLAND AT THE ENTRANCE TO THE NORTHBOUND TRAFFIC ON RAMP TO INTERSTATE 880 FREWAY FROM HEGENBERGER ROAD. ASSUMED ELEVATION TAKEN AS 5.51 M.S.L. CITY OF OAKLAND DATUM.

MONITOR WELL DATA TABLE

WELL DESIGNATION	ELEV	DESCRIPTION
MW1	5.31	TOP OF PVC CASING
	5.49	TOP OF BOX
MW2	5.78	TOP OF PVC CASING
	5.96	TOP OF BOX
MW3	5.51	TOP OF PVC CASING
	5.81	TOP OF BOX
MW4	6.61	TOP OF PVC CASING
	6.89	TOP OF BOX

APPENDIX E

Chain of Custody Records
Laboratory Analysis Data Sheets
Non-Hazardous Waste Data Form

CHAIN OF CUSTODY RECORD

San Jose Branch
3315 Almaden Expressway, Suite 34
San Jose, CA 95118 (408)264-7723

Applied GeoSystems

SAMPLER (signature): Stephen Bittman by BD

Phone: (408) 264-7723

LABORATORY: ANAMETRIX INC

TURNAROUND TIME: Two Weeks

Project Leader: Bill Dugan

Phone No. (408) 264-7723

SHIPPING INFORMATION:

Shipper

Address

Date Shipped

Service Used

Airbill No. Cooler No.

Relinquished by: (signatures)	Received by: (signatures)	Date	Tim
Stephen Bittman by BD	William R. Dugan	11-6-89	10:0
William R. Dugan	Received for laboratory by: [signature]	11-6-89	15.

LABORATORY SHOULD SIGN UPON RECEIPT AND RETURN A COPY OF THIS FORM WITH THE LABORATORY RESULTS

Sample No.	Site Identification	Date Sampled	Analyses Requested	Sample Condition Upon Receipt
S-5-B1	69038-1	10-30-89	TPHd, TPHg, BTEX,	OK
S-10-B1	↓	10-30-89	TOG, lead, total Chromium,	↓
S-20-B1	↓	10-30-89	Cadmium and Zinc	↓
S-5-B2	↓	10-31-89	↓	↓
S-11-B2	↓	10-31-89	↓	↓
S-19-B2	↓	10-31-89	↓	↓
S-21-B2	↓ BD	10-31-89	↓ BD	↓
S-24-B1	69038-1	10-30-89	↓ BD	↓
S-16-B2	69038-1	10-30-89	TPHd, TPHg, BTEX	
			503E, lead, total Chromium	OK
			Cadmium and Zinc,	
			EPA Method 8240 and	
			EPA Method 8270	
			BD	

ORGANIC ANALYSIS DATA SHEET -- EPA METHOD 625/8270
ANAMETRIX, INC. (408) 432-8192

Sample I.D.	: METHOD BLANK	Anametrix I.D.	: 2CB1114C01
Matrix	: SOIL	Analyst	: UH
Date sampled	: N/A	Supervisor	: PG
Date ext.	: 11/14/89	Date released	: 11/21/89
Date analyzed	: 11/15/89	Weight ext.	: 30 g
Dilut. factor	: NONE	Instrument ID	: F2

CAS #	Compound Name	Reporting Limit (ug/Kg)	Amount Found (ug/Kg)
121-14-2	* 2,4-Dinitrotoluene	330	ND
606-20-2	* 2,6-Dinitrotoluene	330	ND
84-66-2	* Diethylphthalate	330	ND
7005-72-3	* 4-Chlorophenyl-phenylether	330	ND
86-73-7	* Fluorene	330	ND
100-01-6	**4-Nitroaniline	1600	ND
534-52-1	**4,6-Dinitro-2-Methylphenol	1600	ND
86-30-6	* N-Nitrosodiphenylamine	330	ND
122-66-7	**Azobenzene	330	ND
101-55-3	* 4-Bromophenyl-phenylether	330	ND
118-74-1	* Hexachlorobenzene	330	ND
87-86-5	* Pentachlorophenol	1600	ND
85-01-8	* Phenanthrene	330	ND
120-12-7	* Anthracene	330	ND
84-74-2	* Di-n-Butylphthalate	330	ND
206-44-0	* Fluoranthene	330	ND
92-87-5	* Benzidine	1600	ND
129-00-0	* Pyrene	330	ND
85-68-7	* Butylbenzylphthalate	330	ND
91-94-1	* 3,3'-Dichlorobenzidine	660	ND
56-55-3	* Benzo(a)Anthracene	330	ND
117-81-7	* bis(2-Ethylhexyl)Phthalate	330	ND
218-01-9	* Chrysene	330	ND
117-84-0	* Di-n-Octyl Phthalate	330	ND
205-99-2	* Benzo(b)Fluoranthene	330	ND
207-08-9	* Benzo(k)Fluoranthene	330	ND
50-32-8	* Benzo(a)Pyrene	330	ND
193-39-5	* Indeno(1,2,3-cd)Pyrene	330	ND
53-70-3	* Dibenz(a,h)Anthracene	330	ND
191-24-2	* Benzo(g,h,i)Perylene	330	ND

CAS #	Surrogate Compounds	Limits	%Recovery
367-12-4	2-Fluorophenol	15-83%	55%
4165-62-2	Phenol-d6	18-92%	55%
4165-60-0	Nitrobenzene-d5	12-80%	52%
321-60-8	2-Fluorobiphenyl	16-100%	53%
118-79-6	2,4,6-Tribromophenol	15-135%	64%
1718-51-0	Terphenyl-d14	15-117%	94%

ND : Not detected at or above practical quantitation limit for the method.
* A 625 approved compound (Federal Register, 10/26/84).
** A compound on the U.S. EPA CLP Hazardous Substance List (HSL).

REPORT SUMMARY
ANAMETRIX, INC. (408) 432-8192

Client : Applied GeoSystems
Address : 3315 Almaden Expressway
Suite 34
City : San Jose, CA 95118
Attn. : Bill Dugan

Anametrix W.O.#: 0111045
Date Received : 11/06/89
Purchase Order#: N/A
Project No. : 69038-1
Date Released : 11/21/89

Anametrix I.D.	Sample I.D.	Matrix	Date Sampled	Method	Date Extract	Date Analyzed	Inst I.D.
RESULTS							
8911045-01	S-5-B1	SOIL	10/30/89	TPH	11/08/89	11/21/89	N/A
8911045-02	S-10-B1	SOIL	10/30/89	TPH	11/08/89	11/17/89	N/A
8911045-03	S-20-B1	SOIL	10/30/89	TPH	11/08/89	11/17/89	N/A
8911045-04	S-5-B2	SOIL	10/31/89	TPH	11/08/89	11/17/89	N/A
8911045-05	S-11-B2	SOIL	10/31/89	TPH	11/08/89	11/17/89	N/A
8911045-06	S-19-B2	SOIL	10/31/89	TPH	11/08/89	11/17/89	N/A
8911045-07	S-21-B2	SOIL	10/31/89	TPH	11/08/89	11/17/89	N/A
8911045-08	S-24-B1	SOIL	10/30/89	TPH	11/08/89	11/17/89	N/A
8911045-09	S-16-B2	SOIL	10/30/89	TPH	11/08/89	11/21/89	N/A
QUALITY ASSURANCE (QA)							
8911045-05	S-11-B2	SOIL	10/31/89	SPIKE	11/08/89	11/09/89	N/A

ANALYSIS DATA SHEET - PETROLEUM HYDROCARBON COMPOUNDS
ANAMETRIX, INC. (408) 432-8192

Sample I.D.	: 69038-1 S-5-B1	Anametrix I.D.	: 8911045-01
Matrix	: SOIL	Analyst	: CG
Date sampled	: 10/30/89	Supervisor	: TR
Date anl.TPHg	: 11/08/89	Date released	: 11/21/89
Date ext.TPHd	: 11/08/89	Date ext. TOG	: 11/09/89
Date anl.TPHd	: 11/21/89	Date anl. TOG	: 11/09/89

CAS #	Compound Name	Detection Limit (ug/kg)	Amount Found (ug/kg)
71-43-2	Benzene	5	ND
108-88-3	Toluene	5	ND
100-41-4	Ethylbenzene	5	ND
1330-20-7	Total Xylenes	5	ND
	TPH as Gasoline	1000	ND
	TPH as Diesel	10000	200000
	Total Oil & Grease	30000	1600000

ND - Not detected at or above the practical quantitation limit for the method.
TPHg - Total Petroleum Hydrocarbons as gasoline is determined by GCFID using EPA Method 5030.
TPHd - Total Petroleum Hydrocarbons as diesel is determined by GCFID following either EPA Method 3510 or 3550.
TOG - Total Oil & Grease is determined by Standard Method 503E.
BTEX - Benzene, Toluene, Ethylbenzene, and Total Xylenes are determined by modified EPA 8020.

All testing procedures follow California Department of Health Services (Cal-DHS) approved methods.

ANALYSIS DATA SHEET - PETROLEUM HYDROCARBON COMPOUNDS
ANAMETRIX, INC. (408) 432-8192

Sample I.D.	: 69038-1 S-10-B1	Anametrix I.D.	: 8911045-02
Matrix	: SOIL	Analyst	: CN
Date sampled	: 10/30/89	Supervisor	: TC
Date anl.TPHg	: 11/08/89	Date released	: 11/21/89
Date ext.TPHd	: 11/08/89	Date ext. TOG	: 11/09/89
Date anl.TPHd	: 11/17/89	Date anl. TOG	: 11/09/89

CAS #	Compound Name	Detection Limit (ug/kg)	Amount Found (ug/kg)
71-43-2	Benzene	5	ND
108-88-3	Toluene	5	ND
100-41-4	Ethylbenzene	5	ND
1330-20-7	Total Xylenes	5	ND
	TPH as Gasoline	1000	ND
	TPH as Diesel	10000	ND
	Total Oil & Grease	30000	ND

ND - Not detected at or above the practical quantitation limit for the method.
TPHg - Total Petroleum Hydrocarbons as gasoline is determined by GCFID using EPA Method 5030.
TPHd - Total Petroleum Hydrocarbons as diesel is determined by GCFID following either EPA Method 3510 or 3550.
TOG - Total Oil & Grease is determined by Standard Method 503E.
BTEX - Benzene, Toluene, Ethylbenzene, and Total Xylenes are determined by modified EPA 8020.

All testing procedures follow California Department of Health Services (Cal-DHS) approved methods.

ANALYSIS DATA SHEET - PETROLEUM HYDROCARBON COMPOUNDS
ANAMETRIX, INC. (408) 432-8192

Sample I.D.	: 69038-1 S-20-B1	Anametrix I.D.	: 8911045-03
Matrix	: SOIL	Analyst	: ON
Date sampled	: 10/30/89	Supervisor	: TC
Date anl.TPHg	: 11/08/89	Date released	: 11/21/89
Date ext.TPHd	: 11/08/89	Date ext. TOG	: 11/09/89
Date anl.TPHd	: 11/17/89	Date anl. TOG	: 11/09/89

CAS #	Compound Name	Detection Limit (ug/kg)	Amount Found (ug/kg)
71-43-2	Benzene	5	ND
108-88-3	Toluene	5	ND
100-41-4	Ethylbenzene	5	ND
1330-20-7	Total Xylenes	5	ND
	TPH as Gasoline	1000	ND
	TPH as Diesel	10000	ND
	Total Oil & Grease	30000	ND

ND - Not detected at or above the practical quantitation limit for the method.
TPHg - Total Petroleum Hydrocarbons as gasoline is determined by GCFID using EPA Method 5030.
TPHd - Total Petroleum Hydrocarbons as diesel is determined by GCFID following either EPA Method 3510 or 3550.
TOG - Total Oil & Grease is determined by Standard Method 503E.
BTEX - Benzene, Toluene, Ethylbenzene, and Total Xylenes are determined by modified EPA 8020.

All testing procedures follow California Department of Health Services (Cal-DHS) approved methods.

ANALYSIS DATA SHEET - PETROLEUM HYDROCARBON COMPOUNDS
ANAMETRIX, INC. (408) 432-8192

Sample I.D.	: 69038-1 S-5-B2	Anametrix I.D.	: 8911045-04
Matrix	: SOIL	Analyst	: ON
Date sampled	: 10/31/89	Supervisor	: TC
Date anl.TPHg	: 11/09/89	Date released	: 11/21/89
Date ext.TPHd	: 11/08/89	Date ext. TOG	: 11/09/89
Date anl.TPHd	: 11/17/89	Date anl. TOG	: 11/09/89

CAS #	Compound Name	Detection Limit (ug/kg)	Amount Found (ug/kg)
71-43-2	Benzene	100	1800
108-88-3	Toluene	100	250
100-41-4	Ethylbenzene	100	480
1330-20-7	Total Xylenes	100	2600
	TPH as Gasoline	2000	52000
	TPH as Diesel	10000	ND
	Total Oil & Grease	30000	280000

ND - Not detected at or above the practical quantitation limit for the method.
TPHg - Total Petroleum Hydrocarbons as gasoline is determined by GCFID using EPA Method 5030.
TPHd - Total Petroleum Hydrocarbons as diesel is determined by GCFID following either EPA Method 3510 or 3550.
TOG - Total Oil & Grease is determined by Standard Method 503E.
BTEX - Benzene, Toluene, Ethylbenzene, and Total Xylenes are determined by modified EPA 8020.

All testing procedures follow California Department of Health Services (Cal-DHS) approved methods.

ANALYSIS DATA SHEET - PETROLEUM HYDROCARBON COMPOUNDS
ANAMETRIX, INC. (408) 432-8192

Sample I.D.	: 69038-1 S-11-B2	Anametrix I.D.	: 8911045-05
Matrix	: SOIL	Analyst	: ow
Date sampled	: 10/31/89	Supervisor	: TC
Date anl.TPHg	: 11/09/89	Date released	: 11/21/89
Date ext.TPHd	: 11/08/89	Date ext. TOG	: 11/09/89
Date anl.TPHd	: 11/17/89	Date anl. TOG	: 11/09/89

CAS #	Compound Name	Detection Limit (ug/kg)	Amount Found (ug/kg)
71-43-2	Benzene	100	750
108-88-3	Toluene	100	510
100-41-4	Ethylbenzene	100	430
1330-20-7	Total Xylenes	100	2700
	TPH as Gasoline	2000	30000
	TPH as Diesel	10000	ND
	Total Oil & Grease	30000	ND

ND - Not detected at or above the practical quantitation limit for the method.
TPHg - Total Petroleum Hydrocarbons as gasoline is determined by GCFID using EPA Method 5030.
TPHd - Total Petroleum Hydrocarbons as diesel is determined by GCFID following either EPA Method 3510 or 3550.
TOG - Total Oil & Grease is determined by Standard Method 503E.
BTEX - Benzene, Toluene, Ethylbenzene, and Total Xylenes are determined by modified EPA 8020.

All testing procedures follow California Department of Health Services (Cal-DHS) approved methods.

ANALYSIS DATA SHEET - PETROLEUM HYDROCARBON COMPOUNDS
ANAMETRIX, INC. (408) 432-8192

Sample I.D.	: 69038-1 S-19-B2	Anametrix I.D.	: 8911045-06
Matrix	: SOIL	Analyst	: [illegible]
Date sampled	: 10/31/89	Supervisor	: TC
Date anl.TPHg	: 11/09/89	Date released	: 11/21/89
Date ext.TPHd	: 11/08/89	Date ext. TOG	: 11/09/89
Date anl.TPHd	: 11/17/89	Date anl. TOG	: 11/09/89

CAS #	Compound Name	Detection Limit (ug/kg)	Amount Found (ug/kg)
71-43-2	Benzene	20	250
108-88-3	Toluene	20	1200
100-41-4	Ethylbenzene	20	220
1330-20-7	Total Xylenes	20	1500
	TPH as Gasoline	1000	11000
	TPH as Diesel	10000	14000
	Total Oil & Grease	30000	ND

ND - Not detected at or above the practical quantitation limit for the method.
TPHg - Total Petroleum Hydrocarbons as gasoline is determined by GCFID using EPA Method 5030.
TPHd - Total Petroleum Hydrocarbons as diesel is determined by GCFID following either EPA Method 3510 or 3550.
TOG - Total Oil & Grease is determined by Standard Method 503E.
BTEX - Benzene, Toluene, Ethylbenzene, and Total Xylenes are determined by modified EPA 8020.

All testing procedures follow California Department of Health Services (Cal-DHS) approved methods.

ANALYSIS DATA SHEET - PETROLEUM HYDROCARBON COMPOUNDS
ANAMETRIX, INC. (408) 432-8192

Sample I.D. : 69038-1 S-21-B2
Matrix : SOIL
Date sampled : 10/31/89
Date anl.TPHg: 11/08/89
Date ext.TPHd: 11/08/89
Date anl.TPHd: 11/17/89

Anametrix I.D. : 8911045-07
Analyst : [illegible]
Supervisor : TC
Date released : 11/21/89
Date ext. TOG : 11/09/89
Date anl. TOG : 11/09/89

CAS #	Compound Name	Detection Limit (ug/kg)	Amount Found (ug/kg)
71-43-2	Benzene	5	ND
108-88-3	Toluene	5	12
100-41-4	Ethylbenzene	5	ND
1330-20-7	Total Xylenes	5	21
	TPH as Gasoline	1000	ND
	TPH as Diesel	10000	ND
	Total Oil & Grease	30000	ND

ND - Not detected at or above the practical quantitation limit for the method.
TPHg - Total Petroleum Hydrocarbons as gasoline is determined by GCFID using EPA Method 5030.
TPHd - Total Petroleum Hydrocarbons as diesel is determined by GCFID following either EPA Method 3510 or 3550.
TOG - Total Oil & Grease is determined by Standard Method 503E.
BTEX - Benzene, Toluene, Ethylbenzene, and Total Xylenes are determined by modified EPA 8020.

All testing procedures follow California Department of Health Services (Cal-DHS) approved methods.

ANALYSIS DATA SHEET - PETROLEUM HYDROCARBON COMPOUNDS
ANAMETRIX, INC. (408) 432-8192

Sample I.D.	: 69038-1 S-24-B1	Anametrix I.D.	: 8911045-08
Matrix	: SOIL	Analyst	: DV
Date sampled	: 10/30/89	Supervisor	: TC
Date anl.TPHg	: 11/08/89	Date released	: 11/21/89
Date ext.TPHd	: 11/08/89	Date ext. TOG	: 11/09/89
Date anl.TPHd	: 11/17/89	Date anl. TOG	: 11/09/89

CAS #	Compound Name	Detection Limit (ug/kg)	Amount Found (ug/kg)
71-43-2	Benzene	5	ND
108-88-3	Toluene	5	ND
100-41-4	Ethylbenzene	5	ND
1330-20-7	Total Xylenes	5	ND
	TPH as Gasoline	1000	ND
	TPH as Diesel	10000	ND
	Total Oil & Grease	30000	ND

ND - Not detected at or above the practical quantitation limit for the method.
TPHg - Total Petroleum Hydrocarbons as gasoline is determined by GCFID using EPA Method 5030.
TPHd - Total Petroleum Hydrocarbons as diesel is determined by GCFID following either EPA Method 3510 or 3550.
TOG - Total Oil & Grease is determined by Standard Method 503E.
BTEX - Benzene, Toluene, Ethylbenzene, and Total Xylenes are determined by modified EPA 8020.

All testing procedures follow California Department of Health Services (Cal-DHS) approved methods.

ANALYSIS DATA SHEET - PETROLEUM HYDROCARBON COMPOUNDS
ANAMETRIX, INC. (408) 432-8192

Sample I.D.	: 69038-1 S-16-B2	Anametrix I.D.	: 8911045-09
Matrix	: SOIL	Analyst	: ON
Date sampled	: 10/30/89	Supervisor	: TC
Date anl.TPHg	: 11/09/89	Date released	: 11/21/89
Date ext.TPHd	: 11/08/89	Date ext. TOG	: 11/09/89
Date anl.TPHd	: 11/21/89	Date anl. TOG	: 11/09/89

CAS #	Compound Name	Detection Limit (ug/kg)	Amount Found (ug/kg)
71-43-2	Benzene	100000	ND
108-88-3	Toluene	100000	1400000
100-41-4	Ethylbenzene	100000	490000
1330-20-7	Total Xylenes	100000	3200000
	TPH as Gasoline	2000000	52000000
	TPH as Diesel	10000	5700000
	Total Oil & Grease	30000	2300000

ND - Not detected at or above the practical quantitation limit for the method.
TPHg - Total Petroleum Hydrocarbons as gasoline is determined by GCFID using EPA Method 5030.
TPHd - Total Petroleum Hydrocarbons as diesel is determined by GCFID following either EPA Method 3510 or 3550.
TOG - Total Oil & Grease is determined by Standard Method 503E.
BTEX - Benzene, Toluene, Ethylbenzene, and Total Xylenes are determined by modified EPA 8020.

All testing procedures follow California Department of Health Services (Cal-DHS) approved methods.

TOTAL OIL AND GREASE MATRIX SPIKE
STANDARD METHOD 503E
ANAMETRIX, INC. (408) 432-8192

Sample I.D. : 69038-1 S-11-B2
Matrix : SOIL
Date Sampled : 10/31/89
Date extracted: 11/08/89
Date analyzed : 11/09/89

Anametrix I.D. : 8911045-05
Analyst : ca
Supervisor : TC
Date Released : 11/21/89

COMPOUND	SPIKE AMT. (UG/Kg)	8911045 MS (UG/Kg)	%REC MS	8911045 MSD (UG/Kg)	%REC MSD	RPD	%REC LIMITS
Motor Oil	300000	270000	90%	290000	97%	7%	45-115%

REPORT SUMMARY
ANAMETRIX, INC. (408) 432-8192

Client : Applied GeoSystems
Address : 3315 Almaden Expressway
Suite 34
City : San Jose, CA 95118
Attn. : Bill Dugan

Anametrix W.O.#: 0211045
Date Received : 11/06/89
Purchase Order#: N/A
Project No. : 69038-1
Date Released : 11/21/89

Anametrix I.D.	Sample I.D.	Matrix	Date Sampled	Method	Date Extract	Date Analyzed	Inst I.D.
RESULTS							
8911045-01	S-5-B1	SOIL	10/30/89	METALS		11/14/89	ICP1
8911045-02	S-10-B1	SOIL	10/30/89	METALS		11/14/89	ICP1
8911045-03	S-20-B1	SOIL	10/30/89	METALS		11/14/89	ICP1
8911045-04	S-5-B2	SOIL	10/31/89	METALS		11/14/89	ICP1
8911045-05	S-11-B2	SOIL	10/31/89	METALS		11/14/89	ICP1
8911045-06	S-19-B2	SOIL	10/31/89	METALS		11/14/89	ICP1
8911045-07	S-21-B2	SOIL	10/30/89	METALS		11/14/89	ICP1
8911045-08	S-24-B1	SOIL	10/30/89	METALS		11/14/89	ICP1
8911045-09	S-16-B2	SOIL	10/30/89	METALS		11/14/89	ICP1
QUALITY ASSURANCE (QA)							
MB110989S	METHOD BLANK	SOIL	N/A	METALS		11/14/89	ICP1

ANALYSIS DATA SHEET - INDIVIDUAL METALS
ANAMETRIX, INC. (408) 432-8192

Sample I.D. : 69038-1 S-5-B1
Matrix : SOIL
Date Sampled : 10/30/89
Date Prepared: 11/09/89
Date Analyzed: 11/14/89

Anametrix ID : 8911045-01
Analyst : MN
Supervisor : BW
Instrument ID: ICP1
Date released: 11/21/89

EPA METHOD NO.	COMPOUNDS	Reporting Limit (mg/kg)	Amount Found (mg/kg)
6010	Cadmium (Cd)	0.5	ND
6010	Total Chromium (Ttl Cr)	0.5	46.8
6010	Lead (Pb)	1.0	29.8
6010	Zinc (Zn)	0.5	67.3

ND : Not detected at or above the practical quantitation limit for the method.

ANALYSIS DATA SHEET - INDIVIDUAL METALS
ANAMETRIX, INC. (408) 432-8192

Sample I.D. : 69038-1 S-10-B1
Matrix : SOIL
Date Sampled : 10/30/89
Date Prepared: 11/09/89
Date Analyzed: 11/14/89

Anametrix ID : 8911045-02
Analyst : MW
Supervisor : BWS
Instrument ID: ICP1
Date released: 11/21/89

EPA METHOD NO.	COMPOUNDS	Reporting Limit (mg/kg)	Amount Found (mg/kg)
6010	Cadmium (Cd)	0.5	ND
6010	Total Chromium (Ttl Cr)	0.5	31.2
6010	Lead (Pb)	1.0	ND
6010	Zinc (Zn)	0.5	48.5

ND : Not detected at or above the practical quantitation limit for the method.

ANALYSIS DATA SHEET - INDIVIDUAL METALS
ANAMETRIX, INC. (408) 432-8192

Sample I.D. : 69038-1 S-20-B1
Matrix : SOIL
Date Sampled : 10/30/89
Date Prepared: 11/09/89
Date Analyzed: 11/14/89

Anametrix ID : 8911045-03
Analyst : MN
Supervisor : BWS
Instrument ID: ICP1
Date released: 11/21/89

EPA METHOD NO.	COMPOUNDS	Reporting Limit (mg/kg)	Amount Found (mg/kg)
6010	Cadmium (Cd)	0.5	ND
6010	Total Chromium (Ttl Cr)	0.5	39.2
6010	Lead (Pb)	1.0	ND
6010	Zinc (Zn)	0.5	62.5

ND : Not detected at or above the practical quantitation limit for the method.

ANALYSIS DATA SHEET - INDIVIDUAL METALS
ANAMETRIX, INC. (408) 432-8192

Sample I.D. : 69038-1 S-5-B2
Matrix : SOIL
Date Sampled : 10/31/89
Date Prepared: 11/09/89
Date Analyzed: 11/14/89

Anametrix ID : 8911045-04
Analyst : MN
Supervisor : BWS
Instrument ID: ICP1
Date released: 11/21/89

EPA METHOD NO.	COMPOUNDS	Reporting Limit (mg/kg)	Amount Found (mg/kg)
6010	Cadmium (Cd)	0.5	ND
6010	Total Chromium (Ttl Cr)	0.5	32.4
6010	Lead (Pb)	1.0	19.9
6010	Zinc (Zn)	0.5	64.1

ND : Not detected at or above the practical quantitation limit for the method.

ANALYSIS DATA SHEET - INDIVIDUAL METALS
ANAMETRIX, INC. (408) 432-8192

Sample I.D. : 69038-1 S-11-B2
Matrix : SOIL
Date Sampled : 10/31/89
Date Prepared: 11/09/89
Date Analyzed: 11/14/89

Anametrix ID : 8911045-05
Analyst : MW
Supervisor : BWS
Instrument ID: ICP1
Date released: 11/21/89

EPA METHOD NO.	COMPOUNDS	Reporting Limit (mg/kg)	Amount Found (mg/kg)
6010	Cadmium (Cd)	0.5	ND
6010	Total Chromium (Ttl Cr)	0.5	22.4
6010	Lead (Pb)	1.0	2.16
6010	Zinc (Zn)	0.5	33.4

ND : Not detected at or above the practical quantitation limit for the method.

ANALYSIS DATA SHEET - INDIVIDUAL METALS
ANAMETRIX, INC. (408) 432-8192

Sample I.D. : 69038-1 S-19-B2
Matrix : SOIL
Date Sampled : 10/31/89
Date Prepared: 11/09/89
Date Analyzed: 11/14/89

Anametrix ID : 8911045-06
Analyst : MN
Supervisor : BCS
Instrument ID: ICP1
Date released: 11/21/89

EPA METHOD NO.	COMPOUNDS	Reporting Limit (mg/kg)	Amount Found (mg/kg)
6010	Cadmium (Cd)	0.5	ND
6010	Total Chromium (Ttl Cr)	0.5	40.6
6010	Lead (Pb)	1.0	ND
6010	Zinc (Zn)	0.5	60.1

ND : Not detected at or above the practical quantitation limit for the method.

ANALYSIS DATA SHEET - INDIVIDUAL METALS
ANAMETRIX, INC. (408) 432-8192

Sample I.D. : 69038-1 S-21-B2
Matrix : SOIL
Date Sampled : 10/30/89
Date Prepared: 11/09/89
Date Analyzed: 11/14/89

Anametrix ID : 8911045-07
Analyst : MW
Supervisor : BWS
Instrument ID: ICP1
Date released: 11/21/89

EPA METHOD NO.	COMPOUNDS	Reporting Limit (mg/kg)	Amount Found (mg/kg)
6010	Cadmium (Cd)	0.5	ND
6010	Total Chromium (Ttl Cr)	0.5	51.2
6010	Lead (Pb)	1.0	ND
6010	Zinc (Zn)	0.5	126

ND : Not detected at or above the practical quantitation limit for the method.

ANALYSIS DATA SHEET - INDIVIDUAL METALS
ANAMETRIX, INC. (408) 432-8192

Sample I.D. : 69038-1 S-24-B1
Matrix : SOIL
Date Sampled : 10/30/89
Date Prepared: 11/09/89
Date Analyzed: 11/14/89

Anametrix ID : 8911045-08
Analyst : MN
Supervisor : BCS
Instrument ID: ICP1
Date released: 11/21/89

EPA METHOD NO.	COMPOUNDS	Reporting Limit (mg/kg)	Amount Found (mg/kg)
6010	Cadmium (Cd)	0.5	0.757
6010	Total Chromium (Ttl Cr)	0.5	48.2
6010	Lead (Pb)	1.0	ND
6010	Zinc (Zn)	0.5	81.5

ND : Not detected at or above the practical quantitation limit for the method.

ANALYSIS DATA SHEET - INDIVIDUAL METALS
ANAMETRIX, INC. (408) 432-8192

Sample I.D. : 69038-1 S-16-B2
Matrix : SOIL
Date Sampled : 10/30/89
Date Prepared: 11/09/89
Date Analyzed: 11/14/89

Anametrix ID : 8911045-09
Analyst : MN
Supervisor : BAS
Instrument ID: ICP1
Date released: 11/21/89

EPA METHOD NO.	COMPOUNDS	Reporting Limit (mg/kg)	Amount Found (mg/kg)
6010	Cadmium (Cd)	0.5	ND
6010	Total Chromium (Ttl Cr)	0.5	27.6
6010	Lead (Pb)	1.0	10.2
6010	Zinc (Zn)	0.5	43.3

ND : Not detected at or above the practical quantitation limit for the method.

ANALYSIS DATA SHEET - INDIVIDUAL METALS
ANAMETRIX, INC. (408) 432-8192

Sample I.D. : METHOD BLANK
Matrix : SOIL
Date Sampled : N/A
Date Prepared: 11/09/89
Date Analyzed: 11/14/89

Anametrix ID : MB110989S
Analyst : MK
Supervisor : RC
Instrument ID: ICP1
Date released: 11/21/89

EPA METHOD NO.	COMPOUNDS	Reporting Limit (mg/kg)	Amount Found (mg/kg)
6010	Cadmium (Cd)	0.5	ND
6010	Total Chromium (Ttl Cr)	0.5	ND
6010	Lead (Pb)	1.0	ND
6010	Zinc (Zn)	0.5	ND

ND : Not detected at or above the practical quantitation limit for the method.

ANAMETRIX INC
Environmental & Analytical Chemistry
1961 Concourse Drive, Suite E, San Jose, CA 95131
(408) 432-8192 • Fax (408) 432-8198

REPORT

Bill Dugan
Applied GeoSystems
3315 Almaden Expressway
Suite 34
San Jose, CA 95118

November 21, 1989
Anametrix W.O.#: 8911045
Date Received : 11/06/89
Project No. : 69038-1

Dear Mr. Dugan:

Your samples have been received for analysis. The REPORT SUMMARY lists your sample identifications and the analytical methods you requested. The following sections are included in this report: RESULTS and QUALITY ASSURANCE.

NOTE: 1) Amounts reported are net values, i.e. corrected for method blank contamination.
2) The following footnotes are applicable to Methods 624/8240:

- * A Method 624 priority pollutant compound (Federal Register, 10/26/84)
- ** A compound on the U.S. EPA CLP Hazardous Substance List (HSL)
- # An additional compound analyzed for by Anametrix, Inc.
- ND: Not detected at or above the practical quantitation limit for the method.

3) TPHd analysis for Sample S-5-B1 contained other components not characteristic diesel fuel which are reported as TPHd.

If there is any more that we can do, please give us a call. Thank you for using ANAMETRIX, INC.

Sincerely,

ANAMETRIX, INC.

Burt Sutherland

Burt Sutherland
Laboratory Director

BWS/lm

REPORT SUMMARY
ANAMETRIX, INC. (408) 432-8192

Client : Applied GeoSystems
Address : 3315 Almaden Expressway
Suite 34
City : San Jose, CA 95118
Attn. : Bill Dugan

Anametrix W.O.#: 8911045
Date Received : 11/06/89
Purchase Order#: N/A
Project No. : 69038-1
Date Released : 11/21/89

Anametrix I.D.	Sample I.D.	Matrix	Date Sampled	Method	Date Extract	Date Analyzed	Inst I.D.
RESULTS							
8911045-09	S-16-B2	SOIL	10/30/89	8240		11/08/89	F3
8911045-09	S-16-B2	SOIL	10/30/89	8270	11/07/89	11/13/89	F2
QUALITY ASSURANCE (QA)							
3CB1108V00	METHOD BLANK	SOIL	N/A	8240		11/08/89	F3
2CB1114C01	METHOD BLANK	SOIL	N/A	8270	11/14/89	11/15/89	F2

ORGANIC ANALYSIS DATA SHEET - EPA METHOD 624/8240
ANAMETRIX, INC. (408) 432-8192

Sample I.D. : 69038-1 S-16-B2
Matrix : SOIL
Date sampled : 10/30/89
Date analyzed: 11/08/89
Dilut. factor: 10000

Anametrix I.D. : 8911045-09
Analyst : UY
Supervisor : PG
Date released : 11/21/89
Instrument ID : F3

CAS #	Compound Name	Reporting Limit (ug/Kg)	Amount Found (ug/Kg)
74-87-3	* Chloromethane	100000	ND
75-01-4	* Vinyl Chloride	100000	ND
74-83-9	* Bromomethane	100000	ND
75-00-3	* Chloroethane	100000	ND
75-69-4	* Trichlorofluoromethane	50000	ND
75-35-4	* 1,1-Dichloroethene	50000	ND
76-13-1	# Trichlorotrifluoroethane	50000	ND
67-64-1	**Acetone	200000	ND
75-15-0	**Carbondisulfide	50000	ND
75-09-2	* Methylene Chloride	50000	ND
156-60-5	* Trans-1,2-Dichloroethene	50000	ND
75-34-3	* 1,1-Dichloroethane	50000	ND
78-93-3	**2-Butanone	200000	ND
156-59-2	* Cis-1,2-Dichloroethene	50000	ND
67-66-3	* Chloroform	50000	ND
71-55-6	* 1,1,1-Trichloroethane	50000	ND
56-23-5	* Carbon Tetrachloride	50000	ND
71-43-2	* Benzene	50000	120000
107-06-2	* 1,2-Dichloroethane	50000	ND
79-01-6	* Trichloroethene	50000	ND
78-87-5	* 1,2-Dichloropropane	50000	ND
75-27-4	* Bromodichloromethane	50000	ND
110-75-8	* 2-Chloroethylvinylether	50000	ND
108-05-4	**Vinyl Acetate	100000	ND
10061-02-6	* Trans-1,3-Dichloropropene	50000	ND
108-10-1	**4-Methyl-2-Pentanone	100000	ND
108-88-3	* Toluene	50000	930000
10061-01-5	* cis-1,3-Dichloropropene	50000	ND
79-00-5	* 1,1,2-Trichloroethane	50000	ND
127-18-4	* Tetrachloroethene	50000	ND
591-78-6	**2-Hexanone	100000	ND
124-48-1	* Dibromochloromethane	50000	ND
108-90-7	* Chlorobenzene	50000	ND
100-41-4	* Ethylbenzene	50000	440000
1330-20-7	**Total Xylenes	50000	2700000
100-42-5	**Styrene	50000	ND
75-25-2	* Bromoform	50000	ND
79-34-5	* 1,1,2,2-Tetrachloroethane	50000	ND
541-73-1	* 1,3-Dichlorobenzene	50000	ND
106-46-7	* 1,4-Dichlorobenzene	50000	ND
95-50-1	* 1,2-Dichlorobenzene	50000	ND

CAS #	Surrogate Compounds	Limits	% Recovery
17060-07-0	1,2-Dichloroethane-d4	75-130%	104%
2037-26-5	Toluene-d8	74-121%	106%
460-00-4	p-Bromofluorobenzene	70-124%	117%

ORGANIC ANALYSIS DATA SHEET -- EPA METHOD 625/8270
ANAMETRIX, INC. (408) 432-8192

Sample I.D. : 69038-1 S-16-B2
Matrix : SOIL
Date sampled : 10/30/89
Date ext. : 11/07/89
Date analyzed: 11/13/89
Dilut. factor: NONE

Anametrix I.D. : 8911045-09
Analyst : UH
Supervisor : PG
Date released : 11/21/89
Weight ext. : 30 g
Instrument ID : F2

CAS #	Compound Name	Reporting Limit (ug/Kg)	Amount Found (ug/Kg)
62-75-9	* N-Nitrosodimethylamine	330	ND
108-95-2	* Phenol	330	ND
62-53-3	**Aniline	330	ND
111-44-4	* bis(-2-Chloroethyl)Ether	330	ND
95-57-8	* 2-Chlorophenol	330	ND
541-73-1	* 1,3-Dichlorobenzene	330	ND
106-46-7	* 1,4-Dichlorobenzene	330	ND
100-51-6	**Benzyl Alcohol	330	ND
95-50-1	* 1,2-Dichlorobenzene	330	ND
95-48-7	**2-Methylphenol	330	ND
108-60-1	**bis(2-chloroisopropyl)Ether	330	ND
106-44-5	**4-Methylphenol	330	ND
621-64-7	* N-Nitroso-Di-n-Propylamine	330	ND
67-72-1	* Hexachloroethane	330	ND
98-95-3	* Nitrobenzene	330	ND
78-59-1	* Isophorone	330	ND
88-75-5	* 2-Nitrophenol	330	ND
105-67-9	* 2,4-Dimethylphenol	330	ND
65-85-0	**Benzoic Acid	1600	ND
111-91-1	* bis(-2-Chloroethoxy)Methane	330	ND
120-83-2	* 2,4-Dichlorophenol	330	ND
120-82-1	* 1,2,4-Trichlorobenzene	330	ND
91-20-3	* Naphthalene	330	11000
106-47-8	**4-Chloroaniline	330	ND
87-68-3	* Hexachlorobutadiene	330	ND
59-50-7	* 4-Chloro-3-Methylphenol	330	ND
91-57-6	**2-Methylnaphthalene	330	6000
77-47-4	* Hexachlorocyclopentadiene	330	ND
88-06-2	* 2,4,6-Trichlorophenol	330	ND
95-95-4	**2,4,5-Trichlorophenol	1600	ND
91-58-7	* 2-Chloronaphthalene	330	ND
88-74-4	**2-Nitroaniline	1600	ND
131-11-3	* Dimethyl Phthalate	330	ND
208-96-8	* Acenaphthylene	330	ND
99-09-2	**3-Nitroaniline	1600	ND
83-32-9	* Acenaphthene	330	ND
51-28-5	* 2,4-Dinitrophenol	1600	ND
100-02-7	* 4-Nitrophenol	1600	ND
132-64-9	**Dibenzofuran	330	ND

ND : Not detected at or above the practical quantitation limit for the method.
* A 625 approved compound (Federal Register, 10/26/84).
** A compound on the U.S. EPA CLP Hazardous Substance List (HSL).

ORGANIC ANALYSIS DATA SHEET -- EPA METHOD 625/8270
ANAMETRIX, INC. (408) 432-8192

Sample I.D. : 69038-1 S-16-B2
Matrix : SOIL
Date sampled : 10/30/89
Date ext. : 11/07/89
Date analyzed: 11/13/89
Dilut. factor: NONE

Anametrix I.D. : 8911045-09
Analyst : UH
Supervisor : PG
Date released : 11/21/89
Weight ext. : 30 g
Instrument ID : F2

CAS #	Compound Name	Reporting Limit (ug/Kg)	Amount Found (ug/Kg)
121-14-2	* 2,4-Dinitrotoluene	330	ND
606-20-2	* 2,6-Dinitrotoluene	330	ND
84-66-2	* Diethylphthalate	330	ND
7005-72-3	* 4-Chlorophenyl-phenylether	330	ND
86-73-7	* Fluorene	330	ND
100-01-6	**4-Nitroaniline	1600	ND
534-52-1	**4,6-Dinitro-2-Methylphenol	1600	ND
86-30-6	* N-Nitrosodiphenylamine	330	ND
122-66-7	**Azobenzene	330	ND
101-55-3	* 4-Bromophenyl-phenylether	330	ND
118-74-1	* Hexachlorobenzene	330	ND
87-86-5	* Pentachlorophenol	1600	ND
85-01-8	* Phenanthrene	330	ND
120-12-7	* Anthracene	330	ND
84-74-2	* Di-n-Butylphthalate	330	ND
206-44-0	* Fluoranthene	330	ND
92-87-5	* Benzidine	1600	ND
129-00-0	* Pyrene	330	ND
85-68-7	* Butylbenzylphthalate	330	770
91-94-1	* 3,3'-Dichlorobenzidine	660	ND
56-55-3	* Benzo(a)Anthracene	330	ND
117-81-7	* bis(2-Ethylhexyl)Phthalate	330	ND
218-01-9	* Chrysene	330	ND
117-84-0	* Di-n-Octyl Phthalate	330	600
205-99-2	* Benzo(b)Fluoranthene	330	ND
207-08-9	* Benzo(k)Fluoranthene	330	ND
50-32-8	* Benzo(a)Pyrene	330	ND
193-39-5	* Indeno(1,2,3-cd)Pyrene	330	ND
53-70-3	* Dibenz(a,h)Anthracene	330	ND
191-24-2	* Benzo(g,h,i)Perylene	330	ND

CAS #	Surrogate Compounds	Limits	%Recovery
367-12-4	2-Fluorophenol	15-83%	19%
4165-62-2	Phenol-d6	18-92%	24%
4165-60-0	Nitrobenzene-d5	12-80%	40%
321-60-8	2-Fluorobiphenyl	16-100%	27%
118-79-6	2,4,6-Tribromophenol	15-135%	34%
1718-51-0	Terphenyl-d14	15-117%	34%

ND : Not detected at or above practical quantitation limit for the method.
* A 625 approved compound (Federal Register, 10/26/84).
** A compound on the U.S. EPA CLP Hazardous Substance List (HSL).

ORGANIC ANALYSIS DATA SHEET - EPA METHOD 624/8240
ANAMETRIX, INC. (408) 432-8192

Sample I.D. : METHOD BLANK
Matrix : SOIL
Date sampled : N/A
Date analyzed: 11/08/89
Dilut. factor: NONE

Anametrix I.D. : 3CB1108V00
Analyst : VH
Supervisor : PG
Date released : 11/21/89
Instrument ID : F3

CAS #	Compound Name	Reporting Limit (ug/Kg)	Amount Found (ug/Kg)
74-87-3	* Chloromethane	10	ND
75-01-4	* Vinyl Chloride	10	ND
74-83-9	* Bromomethane	10	ND
75-00-3	* Chloroethane	10	ND
75-69-4	* Trichlorofluoromethane	5	ND
75-35-4	* 1,1-Dichloroethene	5	ND
76-13-1	# Trichlorotrifluoroethane	5	ND
67-64-1	**Acetone	20	ND
75-15-0	**Carbondisulfide	5	ND
75-09-2	* Methylene Chloride	5	ND
156-60-5	* Trans-1,2-Dichloroethene	5	ND
75-34-3	* 1,1-Dichloroethane	5	ND
78-93-3	**2-Butanone	20	ND
156-59-2	* Cis-1,2-Dichloroethene	5	ND
67-66-3	* Chloroform	5	ND
71-55-6	* 1,1,1-Trichloroethane	5	ND
56-23-5	* Carbon Tetrachloride	5	ND
71-43-2	* Benzene	5	ND
107-06-2	* 1,2-Dichloroethane	5	ND
79-01-6	* Trichloroethene	5	ND
78-87-5	* 1,2-Dichloropropane	5	ND
75-27-4	* Bromodichloromethane	5	ND
110-75-8	* 2-Chloroethylvinylether	5	ND
108-05-4	**Vinyl Acetate	10	ND
10061-02-6	* Trans-1,3-Dichloropropene	5	ND
108-10-1	**4-Methyl-2-Pentanone	10	ND
108-88-3	* Toluene	5	ND
10061-01-5	* cis-1,3-Dichloropropene	5	ND
79-00-5	* 1,1,2-Trichloroethane	5	ND
127-18-4	* Tetrachloroethene	5	ND
591-78-6	**2-Hexanone	10	ND
124-48-1	* Dibromochloromethane	5	ND
108-90-7	* Chlorobenzene	5	ND
100-41-4	* Ethylbenzene	5	ND
1330-20-7	**Total Xylenes	5	ND
100-42-5	**Styrene	5	ND
75-25-2	* Bromoform	5	ND
79-34-5	* 1,1,2,2-Tetrachloroethane	5	ND
541-73-1	* 1,3-Dichlorobenzene	5	ND
106-46-7	* 1,4-Dichlorobenzene	5	ND
95-50-1	* 1,2-Dichlorobenzene	5	ND

CAS #	Surrogate Compounds	Limits	% Recovery
17060-07-0	1,2-Dichloroethane-d4	75-130%	94%
2037-26-5	Toluene-d8	74-121%	107%
460-00-4	p-Bromofluorobenzene	70-124%	96%

ORGANIC ANALYSIS DATA SHEET -- EPA METHOD 625/8270
ANAMETRIX, INC. (408) 432-8192

Sample I.D.	: METHOD BLANK	Anametrix I.D.	: 2CB1114C01
Matrix	: SOIL	Analyst	: UH
Date sampled	: N/A	Supervisor	: PG
Date ext.	: 11/14/89	Date released	: 11/21/89
Date analyzed	: 11/15/89	Weight ext.	: 30 g
Dilut. factor	: NONE	Instrument ID	: F2

CAS #	Compound Name	Reporting Limit (ug/Kg)	Amount Found (ug/Kg)
62-75-9	* N-Nitrosodimethylamine	330	ND
108-95-2	* Phenol	330	ND
62-53-3	**Aniline	330	ND
111-44-4	* bis(-2-Chloroethyl)Ether	330	ND
95-57-8	* 2-Chlorophenol	330	ND
541-73-1	* 1,3-Dichlorobenzene	330	ND
106-46-7	* 1,4-Dichlorobenzene	330	ND
100-51-6	**Benzyl Alcohol	330	ND
95-50-1	* 1,2-Dichlorobenzene	330	ND
95-48-7	**2-Methylphenol	330	ND
108-60-1	**bis(2-chloroisopropyl)Ether	330	ND
106-44-5	**4-Methylphenol	330	ND
621-64-7	* N-Nitroso-Di-n-Propylamine	330	ND
67-72-1	* Hexachloroethane	330	ND
98-95-3	* Nitrobenzene	330	ND
78-59-1	* Isophorone	330	ND
88-75-5	* 2-Nitrophenol	330	ND
105-67-9	* 2,4-Dimethylphenol	330	ND
65-85-0	**Benzoic Acid	1600	ND
111-91-1	* bis(-2-Chloroethoxy)Methane	330	ND
120-83-2	* 2,4-Dichlorophenol	330	ND
120-82-1	* 1,2,4-Trichlorobenzene	330	ND
91-20-3	* Naphthalene	330	ND
106-47-8	**4-Chloroaniline	330	ND
87-68-3	* Hexachlorobutadiene	330	ND
59-50-7	* 4-Chloro-3-Methylphenol	330	ND
91-57-6	**2-Methylnaphthalene	330	ND
77-47-4	* Hexachlorocyclopentadiene	330	ND
88-06-2	* 2,4,6-Trichlorophenol	330	ND
95-95-4	**2,4,5-Trichlorophenol	1600	ND
91-58-7	* 2-Chloronaphthalene	330	ND
88-74-4	**2-Nitroaniline	1600	ND
131-11-3	* Dimethyl Phthalate	330	ND
208-96-8	* Acenaphthylene	330	ND
99-09-2	**3-Nitroaniline	1600	ND
83-32-9	* Acenaphthene	330	ND
51-28-5	* 2,4-Dinitrophenol	1600	ND
100-02-7	* 4-Nitrophenol	1600	ND
132-64-9	**Dibenzofuran	330	ND

ND : Not detected at or above the practical quantitation limit for the method.
* A 625 approved compound (Federal Register, 10/26/84).
** A compound on the U.S. EPA CLP Hazardous Substance List (HSL).

Applied GeoSystems

CHAIN-OF-CUSTODY RECORD

PROJ. NO.	PROJECT NAME
69038-2	ARCO # 4494 Oakland
P.O. NO.	SAMPLERS (Signature)
	Steve Bittman

DATE MM/DD/YY	TIME	SAMPLE I.D.	No. of Containers	TPHg	BTEX	TPHd	TOG	VOC's (8240)	Lead	Cadmium	Zinc	Total Chromium	Preserved? Y/N	LABORATORY I.D. NUMBER
8-10-90		S-5-B3	1	X	X	X	X		X	X	X	X	ice	
		S-20-B3	1	X	X	X	X		X	X	X	X		
		S-23-B3	1	X	X	X	X		X	X	X	X		If S-20-B3 is ND, then HOLD
		S-7-B4	1	X	X	X	X		X	X	X	X		
		S-10-B4	1	X	X	X	X		X	X	X	X		
		S-19.5-B4	1	X	X	X	X		X	X	X	X		
		S-22-B4	1	X	X	X	X		X	X	X	X		If S-19.5-B4 is ND, then HOLD
		S-6-B5	1	X	X	X	X	X	X	X	X	X		
V		S-11-B5	1	X	X	X	X	X	X	X	X	X		If S-6-B5 is ND, then HOLD

RELINQUISHED BY (Signature):	DATE / TIME	RECEIVED BY (Signature):
Steve Bittman	8/13/90 08:40	Ken Mateik
RELINQUISHED BY (Signature):	DATE / TIME	RECEIVED BY (Signature):
Ken Mateik	8/14/90 08:35	
RELINQUISHED BY (Signature):	DATE / TIME	RECEIVED FOR LABORATORY BY (Signature):

REMARKS:

LABORATORY

Applied Analytical

2-week turnaround

SEND RESULTS TO:

Applied GeoSystems
3315 Almaden Expressway
Suite 34
San Jose, California 95118
(408) 264-7723

Proj. Mgr.: Ken Mateik

APPLIED ANALYTICAL

Environmental Laboratories

42501 Albrae St., Suite 100
Fremont, CA 94538
Bus: (415) 623-0775
Fax: (415) 651-8647

ANALYSIS REPORT

1020lab.frm

Attention: Mr. Ken Mateik
Applied GeoSystems
3315 Almaden Expressway
San Jose, CA 95118
Project: AGS 69038-2

Date Sampled: 08-10-90
Date Received: 08-14-90
BTEX Analyzed: 08-15-90
TPHg Analyzed: 08-15-90
TPHd Analyzed: 08-15-90
Matrix: Soil

	Benzene	Toluene	Ethyl-benzene	Total Xylenes	TPHg	TPHd
	ppm	ppm	ppm	ppm	ppm	ppm
Detection Limit:	0.050	0.050	0.050	0.050	2.0	10
SAMPLE Laboratory Identification						
S-5-B3 S1008114	ND	ND	ND	ND	ND	ND
S-20-B3 S1008115	ND	ND	ND	ND	ND	ND
S-7-B4 S1008117	ND	ND	ND	ND	ND	36
S-10-B4 S1008118	ND	ND	ND	ND	ND	ND
S-19.5-B4 S1008119	ND	ND	ND	ND	ND	15

ppm = parts per million = mg/kg = milligrams per kilogram.
ND = Not detected. Compound(s) may be present at concentrations below the detection limit.
NR = Analysis not requested.

ANALYTICAL PROCEDURES

BTEX– Benzene, toluene, ethylbenzene, and total xylene isomers (BTEX) are measured by extraction using EPA Method 5030 followed by analysis using EPA Method 8020/602, which utilizes a gas chromatograph (GC) equipped with a photoionization detector (PID) and a flame-ionization detector (FID) in series.
TPHg–Total petroleum hydrocarbons as gasoline (low-to-medium boiling points) are measured by extraction using EPA Method 5030, followed by analysis using modified EPA Method 8015, which utilizes a GC equipped with an FID.
TPHd–Total petroleum hydrocarbons as diesel (high boiling points) are measured by extraction using EPA Method 3550 for soils and EPA Method 3510 for water, followed by modified EPA Method 8015 with direct sample injection into a GC equipped with an FID.

Laboratory Representative

August 20, 1990
Date Reported

APPLIED ANALYTICAL

Environmental Laboratories

42501 Albrae St., Suite 100
Fremont, CA 94538
Bus: (415) 623-0775
Fax: (415) 651-8647

ANALYSIS REPORT

1020lab.frm

Attention: Mr. Ken Mateik
Applied GeoSystems
3315 Almaden Expressway
San Jose, CA 95118
Project: AGS 69038-2

Date Sampled: 08-10-90
Date Received: 08-14-90
BTEX Analyzed: 08-15-90
TPHg Analyzed: 08-15-90
TPHd Analyzed: 08-15-90
Matrix: Soil

	Benzene	Toluene	Ethyl-benzene	Total Xylenes	TPHg	TPHd
	ppm	ppm	ppm	ppm	ppm	ppm
Detection Limit:	0.050	0.050	0.050	0.050	2.0	10
SAMPLE Laboratory Identification						
S-6-B5 S1008121	ND	ND	ND	ND	ND	ND

ppm = parts per million = mg/kg = milligrams per kilogram.
ND = Not detected. Compound(s) may be present at concentrations below the detection limit.
NR = Analysis not requested.

ANALYTICAL PROCEDURES

BTEX-- Benzene, toluene, ethylbenzene, and total xylene isomers (BTEX) are measured by extraction using EPA Method 5030 followed by analysis using EPA Method 8020/602, which utilizes a gas chromatograph (GC) equipped with a photoionization detector (PID) and a flame-ionization detector (FID) in series.

TPHg--Total petroleum hydrocarbons as gasoline (low-to-medium boiling points) are measured by extraction using EPA Method 5030, followed by analysis using modified EPA Method 8015, which utilizes a GC equipped with an FID.

TPHd--Total petroleum hydrocarbons as diesel (high boiling points) are measured by extraction using EPA Method 3550 for soils and EPA Method 3510 for water, followed by modified EPA Method 8015 with direct sample injection into a GC equipped with an FID.

Laboratory Representative

August 20, 1990
Date Reported

APPLIED ANALYTICAL

Environmental Laboratories

42501 Albrae St., Suite 100
Fremont, CA 94538
Bus: (415) 623-0775
Fax: (415) 651-8647

ANALYSIS REPORT

togsoil.rpt

Report Prepared for:
Applied GeoSystems
3315 Almaden Expressway
San Jose, CA 95118
Attention: Ken Mateik

Date Received:	08-14-90
Laboratory #:	S1008114
Project #:	69038-2
Sample #:	S-5-B3
Matrix:	Soil

Parameter	Result (mg/kg)	Detection Limit (mg/kg)	Date Analyzed
TPH as Oil and Grease	ND	50	08-14-90

mg/kg = milligrams per kilogram = ppm
ND = Not detected. Compound(s) may be present at concentrations below the detection limit.

PROCEDURES

TPH as Oil and Grease: Total Petroleum Hydrocarbons as Oil and Grease are measured by extraction and gravimetric analysis according to Standard Method 503D/E.

Laura Kuk
Laboratory Representative

August 15, 1990
Date Reported

APPLIED ANALYTICAL

Environmental Laboratories

42501 Albrae St., Suite 100
Fremont, CA 94538
Bus: (415) 623-0775
Fax: (415) 651-8647

ANALYSIS REPORT

togsoil.rpt

Report Prepared for:
Applied GeoSystems
3315 Almaden Expressway
San Jose, CA 95118
Attention: Ken Mateik

Date Received: 08-14-90
Laboratory #: S1008115
Project #: 69038-2
Sample #: S-20-B3
Matrix: Soil

Parameter	Result (mg/kg)	Detection Limit (mg/kg)	Date Analyzed
TPH as Oil and Grease	ND	50	08-14-90

mg/kg = milligrams per kilogram = ppm
ND = Not detected. Compound(s) may be present at concentrations below the detection limit.

PROCEDURES

TPH as Oil and Grease: Total Petroleum Hydrocarbons as Oil and Grease are measured by extraction and gravimetric analysis according to Standard Method 503D/E.

Laboratory Representative

August 15, 1990
Date Reported

APPLIED ANALYTICAL

Environmental Laboratories

42501 Albrae St., Suite 100
Fremont, CA 94538
Bus: (415) 623-0775
Fax: (415) 651-8647

ANALYSIS REPORT

togsoil.rpt

Report Prepared for:
Applied GeoSystems
3315 Almaden Expressway
San Jose, CA 95118
Attention: Ken Mateik

Date Received: 08-14-90
Laboratory #: S1008117
Project #: 69038-2
Sample #: S-7-B4
Matrix: Soil

Parameter	Result (mg/kg)	Detection Limit (mg/kg)	Date Analyzed
TPH as Oil and Grease	110	50	08-14-90

mg/kg = milligrams per kilogram = ppm
ND = Not detected. Compound(s) may be present at concentrations below the detection limit.

PROCEDURES

TPH as Oil and Grease: Total Petroleum Hydrocarbons as Oil and Grease are measured by extraction and gravimetric analysis according to Standard Method 503D/E.

Laboratory Representative

August 15, 1990
Date Reported

APPLIED ANALYTICAL

Environmental Laboratories

42501 Albrae St., Suite 100
Fremont, CA 94538
Bus: (415) 623-0775
Fax: (415) 651-8647

ANALYSIS REPORT

togsoil.rpt

Report Prepared for:
Applied GeoSystems
3315 Almaden Expressway
San Jose, CA 95118
Attention: Ken Mateik

Date Received:	08-14-90
Laboratory #:	S1008118
Project #:	69038-2
Sample #:	S-10-B4
Matrix:	Soil

Parameter	Result (mg/kg)	Detection Limit (mg/kg)	Date Analyzed
TPH as Oil and Grease	ND	50	08-14-90

mg/kg = milligrams per kilogram = ppm
ND = Not detected. Compound(s) may be present at concentrations below the detection limit.

PROCEDURES

TPH as Oil and Grease: Total Petroleum Hydrocarbons as Oil and Grease are measured by extraction and gravimetric analysis according to Standard Method 503D/E.

Laboratory Representative

August 15, 1990
Date Reported

APPLIED ANALYTICAL

Environmental Laboratories

42501 Albrae St., Suite 100
Fremont, CA 94538
Bus: (415) 623-0775
Fax: (415) 651-8647

ANALYSIS REPORT

togsoil.rpt

Report Prepared for:
Applied GeoSystems
3315 Almaden Expressway
San Jose, CA 95118
Attention: Ken Mateik

Date Received: 08-14-90
Laboratory #: S1008121
Project #: 69038-2
Sample #: S-6-B5
Matrix: Soil

Parameter	Result (mg/kg)	Detection Limit (mg/kg)	Date Analyzed
TPH as Oil and Grease	ND	50	08-14-90

mg/kg = milligrams per kilogram = ppm
ND = Not detected. Compound(s) may be present at concentrations below the detection limit.

PROCEDURES

TPH as Oil and Grease: Total Petroleum Hydrocarbons as Oil and Grease are measured by extraction and gravimetric analysis according to Standard Method 503D/E.

Laboratory Representative

August 15, 1990
Date Reported

APPLIED ANALYTICAL

Environmental Laboratories

42501 Albrae St., Suite 100
Fremont, CA 94538
Bus: (415) 623-0775
Fax: (415) 651-8647

ANALYSIS REPORT

1020lab.frm

Attention: Mr. Ken Mateik
Applied GeoSystems
3315 Almaden Expressway
San Jose, CA 95118

Project: AGS 69038-2

Date Sampled: 08-10-90
Date Received: 08-14-90
Date Extracted: 08-21-90
Date Analyzed: 08-21-90
Matrix: SOIL

	Cadmium ppm	Chromium ppm	Lead ppm	Zinc ppm
Detection Limit:	1.1	1.8	1.9	1.2
SAMPLE Laboratory Identification				
S-5-B3 S1008114	1.1	49	66	48
S-20-B3 S1008115	2.1	55	79	45
S-7-B4 S1008117	4.8	85	170	31
S-10-B4 S1008118	2.7	63	88	44

ppm = parts per million = mg/kg = milligrams per kilogram.
ND = Not detected. Compound(s) may be present at concentrations below the detection limit.
NR = Analysis not requested.

ANALYTICAL PROCEDURES

All metals are extracted according to EPA method 3050 and analyzed according to EPA method 6010.

Laboratory Representative

08-23-90
Date Reported

Applied GeoSystems

CHAIN-OF-CUSTODY RECORD

CHROMALAB FILE # 890068

PROJ NO.	PROJECT NAME
69038-2	ARCO 4494
P.O. NO.	SAMPLERS (Signature)

DATE MM/DD/YY	TIME	SAMPLE I.D.	No. of Containers	TPHg	BTEX	TPHd	8240	Preserved?	LABORATORY I.D. NUMBER
8/10/90		S-6-BS	1				X	ice	
		S-11-BS	1				X	↓	If S-6-BS is ND, then HOLD

RELINQUISHED BY (Signature)	DATE / TIME	RECEIVED BY (Signature)
Lawra Kurk	8/14/90	
RELINQUISHED BY (Signature):	DATE / TIME	RECEIVED BY (Signature):
RELINQUISHED BY (Signature):	DATE / TIME	RECEIVED FOR LABORATORY BY (Signature):
	8/14/90 3:30	

REMARKS:
Chromalab

Normal TAT

SEND RESULTS TO:
Applied GeoSystems
3315 Almaden Expressway
Suite 34
San Jose, California 95118
(408) 264-7723

Proj. Mgr.: Kon Matelik

CHROMALAB, INC.

Analytical Laboratory
Specializing in GC-GC/MS

- Environmental Analysis
- Hazardous Waste (#E694)
- Drinking Water (#955)
- Waste Water
- Consultation

August 27, 1990

ChromaLab File #0890068A

Client:APPLIED GEOSYSTEMS, INC.
Attn: Ken Mateik
Date Sampled: Aug. 10, 1990
Date Submitted: Aug. 14,1990
Date of Analysis: Aug. 22, 1990
Project No: 69038-2
Project Name: ARCO 4494
Sample I.D.: S-6-B5
Method of Analysis: EPA 8240
Detection Limit: 10 µg/Kg

COMPOUND NAME	µg/Kg	Spike Recovery
CHLOROMETHANE	N.D	---
VINYL CHLORIDE	N.D.	---
BROMOMETHANE	N.D.	---
CHLOROETHANE	N.D.	---
TRICHLOROFLUOROMETHANE	N.D.	---
1,1-DICHLOROETHENE	N.D.	97.2%
METHYLENE CHLORIDE	N.D.	---
1,2-DICHLOROETHENE (TOTAL)	N.D.	---
1,1-DICHLOROETHANE	N.D.	---
CHLOROFORM	N.D.	---
1,1,1-TRICHLOROETHANE	N.D.	---
CARBON TETRACHLORIDE	N.D.	---
BENZENE	N.D.	---
1,2-DICHLOROETHANE	N.D.	103.5%
TRICHLOROETHENE	N.D.	---
1,2-DICHLOROPROPANE	N.D.	---
BROMODICHLOROMETHANE	N.D.	---
2-CHLOROETHYLVINYLETHER	N.D.	---
TRANS-1,3-DICHLOROPROPENE	N.D.	---
TOLUENE	N.D.	---
CIS-1,3-DICHLOROPROPENE	N.D.	---
1,1,2-TRICHLOROETHANE	N.D.	---
TETRACHLORCETHENE	N.D.	---
DIBROMOCHLOROMETHANE	N.D.	93.5%
CHLOROBENZENE	N.D.	---
ETHYL BENZENE	N.D.	---
BROMOFORM	N.D.	---
1,1,2,2-TETRACHLOROETHANE	N.D.	---
1,3-DICHLOROBENZENE	N.D.	---
1,4-DICHLOROBENZENE	N.D.	---
1,2-DICHLOROBENZENE	N.D.	---
TOTAL XYLENES	N.D.	101.1%

ChromaLab, Inc.

David Duong
Senior Chemist

Eric Tam
Lab Director

2239 Omega Road, #1 • San Ramon, California 94583
415/831-1788 • Facsimile 415/831-8798
Federal ID #68-0140157

Applied GeoSystems

CHAIN-OF-CUSTODY RECORD

PROJ. NO.	PROJECT NAME
69058-2	ARCO 4494
P.O. NO.	SAMPLERS (Signature)
	Steve Strang

DATE MM/DD/YY	TIME		No. of Containers	TPHgasoline (8015)	BTEX (602/8020)	TPHdiesel (8015)						Preserved?	REMARKS	LABORATORY I.D. NUMBER
8/16/90	1400	S-B31	1	X	X									
		S-B32	1	X	X								Composite w/ 1 week turnaround	
		S-B41	1	X	X									
		S-B42	1	X	X									
↓	↓	S-B43	1	X	X									

RELINQUISHED BY (Signature):	DATE / TIME	RECEIVED BY (Signature):	Laboratory:	SEND RESULTS TO:
Steve Strang	8/17/90 12:04	[illegible] ×660		Applied GeoSystems 3315 Almaden Expressway Suite 34 San Jose, California 95118 (408) 264-7723
RELINQUISHED BY (Signature):	DATE / TIME	RECEIVED BY (Signature):	Turn Around:	Proj. Mgr.:
RELINQUISHED BY (Signature):	DATE / TIME	RECEIVED FOR LABORATORY BY (Signature):		

Applied GeoSystems

CHAIN-OF-CUSTODY RECORD

PROJ. NO.	PROJECT NAME
69058-2	ARCO 4494
P.O. NO.	SAMPLERS (Signature)
	Steve Strauss

DATE (MM/DD/YY)	TIME		No. of Containers	TPHgasoline (8015)	BTEX (602/8020)	TPHdiesel (8015)						Preserved?	REMARKS	LABORATORY I.D. NUMBER
8/16/90	1400	S-B31 } Composite	1	X	X									
		S-B32	1	X	X								composite w/1 week turnaround	
		S-B41	1	X	X									
		S-B42	1	X	X									
↓	↓	S-B43	1	X	X									

RELINQUISHED BY (Signature):	DATE / TIME	RECEIVED BY (Signature):	Laboratory:	SEND RESULTS TO:
Steve Strauss	8/17/90 12:04	T.O. Chambers x1060		Applied GeoSystems 3315 Almaden Expressway Suite 34 San Jose, California 95118 (408) 264-7723
RELINQUISHED BY (Signature):	DATE / TIME	RECEIVED BY (Signature):	Turn Around: 1 week	Proj. Mgr.: Kevin Mateik
T.O. Chambers	8/17/90 1100			
RELINQUISHED BY (Signature):	DATE / TIME	RECEIVED FOR LABORATORY BY (Signature):		
T.O. Chambers	8/17/90 1100	[illegible] 8/17/90		

APPLIED ANALYTICAL

Environmental Laboratories

42501 Albrae St., Suite 100
Fremont, CA 94538
Bus: (415) 623-0775
Fax: (415) 651-8647

ANALYSIS REPORT

1020lab.frm

Attention: Mr. Ken Mateik
Applied GeoSystems
3315 Almaden Expressway
San Jose, CA 95826
Project: AGS 69038-2

Date Sampled: 08-16-90
Date Received: 08-17-90
BTEX Analyzed: 08-17-90
TPHg Analyzed: 08-17-90
TPHd Analyzed: NR
Matrix: Soil

	Benzene	Toluene	Ethyl-benzene	Total Xylenes	TPHg	TPHd
	ppm	ppm	ppm	ppm	ppm	ppm
Detection Limit:	0.050	0.050	0.050	0.050	2.0	10
SAMPLE Laboratory Identification						
S-1-B(31,32,41,42,43) S1008176	ND	ND	ND	ND	ND	NR

ppm = parts per million = mg/kg = milligrams per kilogram.
ND = Not detected. Compound(s) may be present at concentrations below the detection limit.
NR = Analysis not requested.

ANALYTICAL PROCEDURES

BTEX– Benzene, toluene, ethylbenzene, and total xylene isomers (BTEX) are measured by extraction using EPA Method 5030 followed by analysis using EPA Method 8020/602, which utilizes a gas chromatograph (GC) equipped with a photoionization detector (PID) and a flame-ionization detector (FID) in series.

TPHg–Total petroleum hydrocarbons as gasoline (low-to-medium boiling points) are measured by extraction using EPA Method 5030, followed by analysis using modified EPA Method 8015, which utilizes a GC equipped with an FID.

TPHd–Total petroleum hydrocarbons as diesel (high boiling points) are measured by extraction using EPA Method 3550 for soils and EPA Method 3510 for water, followed by modified EPA Method 8015 with direct sample injection into a GC equipped with an FID.

Laboratory Representative

August 21, 1990
Date Reported

Applied GeoSystems

CHAIN-OF-CUSTODY RECORD

PROJ. NO.: 69038-2

PROJECT NAME: ARCO 4494

P.O. NO.:

SAMPLERS (Signature):

DATE MM/DD/YY	TIME	SAMPLE I.D.	No. of Containers	TPHg	BTEX	TPHd	Organic Pb						Preserved?	LABORATORY I.D. NUMBER
8/16/90	1400	S-B31 } composite	1				X						iced	
↓	↓	S-B32	1										↓	
		S-B41	1											
		S-B42	1											
		S-B43	1											

X - Charge to Applied Analytical

RELINQUISHED BY (Signature)	DATE / TIME	RECEIVED BY (Signature)	REMARKS	SEND RESULTS TO
[signature]	8/17 12:30	[signature]	Mobile Chem	Applied GeoSystems 3315 Almaden Expressway Suite 34 San Jose, California 95118 (408) 264-7723
RELINQUISHED BY (Signature):	DATE / TIME	RECEIVED BY (Signature):		
RELINQUISHED BY (Signature):	DATE / TIME	RECEIVED FOR LABORATORY BY (Signature):	24 hr - due 3pm FRIDAY	Proj. Mgr.: Ken Mateik

MOBILE CHEM LABS INC.

5021 Blum Road, Suite 3 • Martinez, CA 94553
Phone (415) 372-3700 • Fax (415) 372-6955

Applied Geosystems
8315 Almaden Expressway
Suite 34
San Jose, CA 99518
Attn: Ken Mateik
Project Manager

Date Sampled: 08-16-90
Date Received: 09-07-90
Date Reported: 09-07-90

ORGANIC LEAD ANALYSIS

Sample Number	Sample Description	Detection Limit	SOIL RESULTS
		ppm	ppm
	Project # : 69038-2 Project Name: Arco 4494		
B090022	S-B31,S-B32,S-B41 S-B42,S-B43 (Comp)	0.5	<0.5

QA/QC: Blank is none detected
Spike Recovery is 85%
Duplicate Deviation is 2.5%

Note: Analysis - California LUFT Manual, 12/87

MOBILE CHEM LABS

Ronald G. Evans
Lab Director

Applied GeoSystems

CHAIN-OF-CUSTODY RECORD

PROJ. NO.	PROJECT NAME
69038-2	ARCO Hegenberger
P.O. NO.	**SAMPLERS (Signature)**
	Mike Bamisch

DATE MM/DD/YY	TIME	SAMPLE I.D.	No. of Containers	TPHg	BTEX	TPHd	organic lead	TOG	VOC 624	Base/Acid 625	Pb/CAD/Chrom/ZN	Iced	Preserved? HCl	LABORATORY I.D. NUMBER
06/19/90	3:00	SP-0619-1A, 1B, 1C, 1D	4	X	X		X					X		
6/19/90	2:00	W-8-MW1	1					X				X		
6/19/90	205	W-8-MW1	1					X				X		
6/19/90	145	MW1-7-4	2	X	X							X	X	
6/19/90	150	W-7-MW1	2	X	X							X	X	
6/19/90	155	W-7-MW1	2						X			X		
6/19/90	210	W-8-MW1	1			X						X		
6/19/90	215	W-8-MW1	1			X						X		
6/19/90	225	W-8-MW1	1							X		X		
6/19/90	230	W-8-MW1	1							X		X		
6/19/90	240	W-8-MW1	1								X	X		
6/19/90	245	W-8-MW1	1								X	X		

RELINQUISHED BY (Signature):	DATE / TIME	RECEIVED BY (Signature):
Mike Bamisch	6/20/90 1130	B. Gardner X282
RELINQUISHED BY (Signature):	**DATE / TIME**	**RECEIVED BY (Signature):**
B. Gardner X282	6/20/90 1218	~~B. Gardner X282~~
RELINQUISHED BY (Signature):	**DATE / TIME**	**RECEIVED FOR LABORATORY BY (Signature):**
		[signature]

REMARKS:

SEND RESULTS TO:

Applied GeoSystems
3315 Almaden Expressway
Suite 34
San Jose, California 95118
(408) 264-7723

Proj. Mgr.: Mike

APPLIED ANALYTICAL

Environmental Laboratories

42501 Albrae St., Suite 100
Fremont, CA 94538
Bus: (415) 623-0775
Fax: (415) 651-8647

ANALYSIS REPORT

1020lab.frm

Attention: Mr. Mike Barminski
Applied GeoSystems
3315 Almaden Expressway
San Jose, CA 95118
Project: AGS 69038-2

Date Sampled: 06-19-90
Date Received: 06-20-90
BTEX Analyzed: 06-26-90
TPHg Analyzed: 06-26-90
TPHd Extracted: 06-25-90
TPHd Analyzed: 07-05-90
Matrix: Soil

	Benzene	Toluene	Ethyl-benzene	Total Xylenes	TPHg	TPHd
	ppm	ppm	ppm	ppm	ppm	ppm
Detection Limit:	0.050	0.050	0.050	0.050	2.0	10
SAMPLE Laboratory Identification						
SP-0619-1(ABCD) S1006759	ND	ND	0.087	0.67	19	110

ppm = parts per million = mg/kg = milligrams per kilogram.
ND = Not detected. Compound(s) may be present at concentrations below the detection limit.
NR = Analysis not requested.

ANALYTICAL PROCEDURES

BTEX– Benzene, toluene, ethylbenzene, and total xylene isomers (BTEX) are measured by extraction using EPA Method 5030 followed by analysis using EPA Method 8020/602, which utilizes a gas chromatograph (GC) equipped with a photoionization detector (PID) and a flame-ionization detector (FID) in series.

TPHg–Total petroleum hydrocarbons as gasoline (low-to-medium boiling points) are measured by extraction using EPA Method 5030, followed by analysis using modified EPA Method 8015, which utilizes a GC equipped with an FID.

TPHd–Total petroleum hydrocarbons as diesel (high boiling points) are measured by extraction using EPA Method 3550 for soils and EPA Method 3510 for water, followed by modified EPA Method 8015 with direct sample injection into a GC equipped with an FID.

Laboratory Representative

07-09-90
Date Reported

APPLIED ANALYTICAL LABORATORY IS CERTIFIED BY THE STATE OF CALIFORNIA
DEPARTMENT OF HEALTH SERVICES AS A HAZARDOUS WASTE TESTING LABORATORY
(Certification No. 153)

APPLIED ANALYTICAL

Environmental Laboratories

42501 Albrae St., Suite 100
Fremont, CA 94538
Bus: (415) 623-0775
Fax: (415) 651-8647

ANALYSIS REPORT

1020lab.frm

Attention: Mr. Mike Barminski
Applied GeoSystems
3315 Almaden Expressway
San Jose, CA 95118
Project: AGS 69038-2

Date Sampled: 06-19-90
Date Received: 06-20-90
BTEX Analyzed: 06-28-90
TPHg Analyzed: 06-28-90
TPHd Extracted: 06-25-90
TPHd Analyzed: 07-06-90
Matrix: Water

	Benzene	Toluene	Ethyl-benzene	Total Xylenes	TPHg	TPHd
	ppb	ppb	ppb	ppb	ppb	ppb
Detection Limit:	0.50	0.50	0.50	0.50	50	100
SAMPLE Laboratory Identification						
W-7-MW1 W1006760	ND	ND	ND	ND	ND	ND

ppb = parts per billion = µg/L = micrograms per liter.
ND = Not detected. Compound(s) may be present at concentrations below the detection limit.
NR = Analysis not requested.

ANALYTICAL PROCEDURES

BTEX– Benzene, toluene, ethylbenzene, and total xylene isomers (BTEX) are measured by extraction using EPA Method 5030 followed by analysis using EPA Method 8020/602, which utilizes a gas chromatograph (GC) equipped with a photoionization detector (PID) and a flame-ionization detector (FID) in series.
TPHg–Total petroleum hydrocarbons as gasoline (low-to-medium boiling points) are measured by extraction using EPA Method 5030, followed by analysis using modified EPA Method 8015, which utilizes a GC equipped with an FID.
TPHd–Total petroleum hydrocarbons as diesel (high boiling points) are measured by extraction using EPA Method 3550 for soils and EPA Method 3510 for water, followed by modified EPA Method 8015 with direct sample injection into a GC equipped with an FID.

Laboratory Representative

07-09-90
Date Reported

APPLIED ANALYTICAL

Environmental Laboratories

42501 Albrae St., Suite 100
Fremont, CA 94538
Bus: (415) 623-0775
Fax: (415) 651-8647

ANALYSIS REPORT

togwater.rpt

Report Prepared for:
Applied GeoSystems
3315 Almaden Expressway
San Jose, CA 95118
Attention: Mike Barminski

Date Received:	06-20-90
Laboratory #:	W1006760
Project #:	69038-2
Sample #:	W-8-MW1
Matrix:	Water

Parameter	Result (µg/L)	Detection Limit (µg/L)	Date Analyzed
TPH as Oil and Grease	ND	5000	06-28-90

µg/L = micrograms per liter = ppb
ND = Not detected. Compound(s) may be present at concentrations below the detection limit.

PROCEDURES

TPH as Oil and Grease: Total Oil and Grease of mineral or petroleum origin are measured by extraction and gravimetric analysis according to Standard Method 503A/E.

Laura Kuck, Laboratory Manager

07-02-90
Date Reported

Applied GeoSystems

CHAIN-OF-CUSTODY RECORD

PROJ. NO.	PROJECT NAME
69038-2	
P.O. NO.	SAMPLERS (Signature)

CHROMALAB FILE # 690211

DATE MM/DD/YY	TIME	SAMPLE I.D.	No. of Containers	TPHg	BTEX	TPHd	V06 624	Base/Acid 625	Pb/Cd/Cr/Zn (6010)	Preserved?	LABORATORY I.D. NUMBER
6-19-90		W-8-MW1					✓	✓	✓		

ANALYSIS

RELINQUISHED BY (Signature):	DATE / TIME	RECEIVED BY (Signature):
RELINQUISHED BY (Signature):	DATE / TIME	RECEIVED BY (Signature):
RELINQUISHED BY (Signature):	DATE / TIME	RECEIVED FOR LABORATORY BY (Signature):

REMARKS:

chromalab

normal TAT

SEND RESULTS TO:
Applied GeoSystems
3315 Almaden Expressway
Suite 34
San Jose, California 95118
(408) 264-7723

Proj. Mgr.: Mike Barminski

CHROMALAB, INC.

Analytical Laboratory
Specializing in GC-GC/MS

- Environmental Analysis
- Hazardous Waste (#E694)
- Drinking Water (#955)
- Waste Water
- Consultation

June 27, 1990 ChromaLab File No.: 0690211

APPLIED GEOSYSTEMS, INC.

Attn: Mike Barminski

RE: One water sample for Cadmium, Chromium, Lead, and Zinc Analyses

Project Number: 69038-2
Date Sampled: June 19, 1990 Date Submitted: June 22, 1990
Date Extracted: June 25-27, 1990 Date Analyzed: June 25-27,1990

RESULTS:

Sample No.	Cadmium (mg/L)	Chromium (mg/L)	Lead (mg/L)	Zinc (mg/L)
W-8-MW1	0.024	N.D.	0.10	0.049
BLANK	N.D.	N.D.	N.D.	N.D.
SPIKE RECOVERY	89.1%	102.0%	96.3%	94.7%
DETECTION LIMIT	0.005	0.05	0.05	0.005
METHOD OF ANALYSIS	7130	7190	7420	7950

ChromaLab, Inc.

David Duong
Senior Chemist

Eric Tam
Laboratory Director

2239 Omega Road, #1 • San Ramon, California 94583
415/831-1788 • Facsimile 415/831-8798
Federal ID #68-0140157

CHROMALAB, INC.

Analytical Laboratory
Specializing in GC-GC/MS

- Environmental Analysis
- Hazardous Waste (#E694)
- Drinking Water (#955)
- Waste Water
- Consultation

June 29, 1990 ChromaLab File #0690211

Client: Applied GeoSystems Attn: Mike Barminski
Date Sampled: June 19, 1990 Date Submitted: June 22, 1990
Date of Analysis: June 28, 1990
Project No: 69038-2
Sample I.D.: W-8-MW1
Method of Analysis: EPA 624 Detection Limit: 4 µg/L

COMPOUND NAME	µg/L	Spike Recovery	
CHLOROMETHANE	N.D	---	
VINYL CHLORIDE	N.D.	---	
BROMOMETHANE	N.D.	---	
CHLOROETHANE	N.D.	---	
TRICHLOROFLUOROMETHANE	N.D.	---	
1,1-DICHLOROETHENE	N.D.	---	
METHYLENE CHLORIDE	N.D.	---	
1,2-DICHLOROETHENE (TOTAL)	N.D.	---	
1,1-DICHLOROETHANE	N.D.	---	
CHLOROFORM	N.D.	98.0%	95.3%
1,1,1-TRICHLOROETHANE	N.D.	---	
CARBON TETRACHLORIDE	N.D.	---	
BENZENE	N.D.	84.9%	88.2%
1,2-DICHLOROETHANE	N.D.	---	
TRICHLOROETHENE	N.D.	---	
1,2-DICHLOROPROPANE	N.D.	---	
BROMODICHLOROMETHANE	N.D.	---	
2-CHLOROETHYLVINYLETHER	N.D.	---	
TRANS-1,3-DICHLOROPROPENE	N.D.	---	
TOLUENE	N.D.	---	
CIS-1,3-DICHLOROPROPENE	N.D.	87.4%	84.1%
1,1,2-TRICHLOROETHANE	N.D.	---	
TETRACHLOROETHENE	N.D.	---	
DIBROMOCHLOROMETHANE	N.D.	---	
CHLOROBENZENE	N.D.	---	
ETHYL BENZENE	N.D.	---	
BROMOFORM	N.D.	---	
1,1,2,2-TETRACHLOROETHANE	N.D.	---	
1,3-DICHLOROBENZENE	N.D.	---	
1,4-DICHLOROBENZENE	N.D.	---	
1,2-DICHLOROBENZENE	N.D.	98.1%	97.6%
TOTAL XYLENES	N.D.	---	

ChromaLab, Inc.

David Duong
Senior Chemist

Eric Tam
Lab Director

2239 Omega Road, #1 • San Ramon, California 94583
415/831-1788 • Facsimile 415/831-8798
Federal ID #68-0140157

CHROMALAB, INC.

Analytical Laboratory
Specializing in GC-GC/MS

- Environmental Analysis
- Hazardous Waste (#E694)
- Drinking Water (#955)
- Waste Water
- Consultation

June 29, 1990

ChromaLab File # 0690211

Client: Applied GeoSystems
Attn: Mike Barminski
Date Sampled: 6/19/90
Date Submitted: 6/22/90
Date Extracted: 6/28/90
Date Analyzed: 6/29/90

Project No.: 69038-2
Sample I.D.: W-8-MW1
Method of Analysis: EPA 625
Matrix: water

COMPOUND NAME	Sample mg/L	MDL mg/L	Spike Recovery
PHENOL	N.D.	0.01	97.9%
BIS(2-CHLOROETHYL) ETHER	N.D.	0.01	-----
2-CHLOROPHENOL	N.D.	0.01	-----
1,3-DICHLOROBENZENE	N.D.	0.01	-----
1,4-DICHLOROBENZENE	N.D.	0.01	-----
BENZYL ALCOHOL	N.D.	0.02	-----
1,2-DICHLOROBENZENE	N.D.	0.01	-----
2-METHYLPHENOL	N.D.	0.01	-----
BIS(2-CHLOROISOPROPYL)ETHER	N.D.	0.01	-----
4-METHYLPHENOL	N.D.	0.01	-----
N-NITROSO-DI-N-PROPYLAMINE	N.D.	0.01	-----
HEXACHLOROETHANE	N.D.	0.01	-----
NITROBENZENE	N.D.	0.01	-----
ISOPHORONE	N.D.	0.01	-----
2-NITROPHENOL	N.D.	0.01	-----
2,4-DIMETHYLPHENOL	N.D.	0.01	-----
BENZOIC ACID	N.D.	0.05	-----
BIS(2-CHLOROETHOXY)METHANE	N.D.	0.01	86.7%
2,4-DICHLOROPHENOL	N.D.	0.01	-----
1,2,4-TRICHLOROBENZENE	N.D.	0.01	-----
NAPHTHALENE	N.D.	0.01	-----
4-CHLOROANILINE	N.D.	0.02	-----
HEXACHLOROBUTADIENE	N.D.	0.01	-----
4-CHLORO-3-METHYLPHENOL	N.D.	0.02	-----
2-METHYLNAPHTHALENE	N.D.	0.01	-----
HEXACHLOROCYCLOPENTADIENE	N.D.	0.01	-----
2,4,6-TRICHLOROPHENOL	N.D.	0.01	- - - - -
2,4,5-TRICHLOROPHENOL	N.D.	0.01	-----
2-CHLORONAPHTHALENE	N.D.	0.01	-----
2-NITROANILINE	N.D.	0.05	-----
DIMETHYL PHTHALATE	N.D.	0.01	-----
ACENAPHTHYLENE	N.D.	0.01	-----
3-NITROANILINE	N.D.	0.05	-----
ACENAPHTHENE	N.D.	0.01	114.2%
2,4-DINITROPHENOL	N.D.	0.05	-----
4-NITROPHENOL	N.D.	0.05	-----
DIBENZOFURAN	N.D.	0.01	-----

(continued on next page)

CHROMALAB, INC.

Analytical Laboratory
Specializing in GC-GC/MS

- Environmental Analysis
- Hazardous Waste (#E694)
- Drinking Water (#955)
- Waste Water
- Consultation

ChromaLab File # 0690211

Project No.: 69038-2
Sample I.D.: W-8-MW1
Method of Analysis: EPA 625 Matrix: water

COMPOUND NAME	Sample mg/L	MDL mg/L	Spike Recovery
2,4-DINITROTOLUENE	N.D.	0.01	-----
2,6-DINITROTOLUENE	N.D.	0.01	107.2%
DIETHYL PHTHALATE	N.D.	0.01	-----
4-CHLORO-PHENYL PHENYL ETHER	N.D.	0.01	-----
FLUORENE	N.D.	0.01	-----
4-NITROANILINE	N.D.	0.05	-----
4,6-DINITRO-2-METHYL PHENOL	N.D.	0.05	-----
N-NITROSODIPHENYLAMINE	N.D.	0.01	-----
4-BROMOPHENYL PHENYL ETHER	N.D.	0.01	-----
HEXACHLOROBENZENE	N.D.	0.01	-----
PENTACHLOROPHENOL	N.D.	0.05	84.3%
PHENANTHRENE	N.D.	0.01	-----
ANTHRACENE	N.D.	0.01	-----
DI-N-BUTYL PHTHALATE	N.D.	0.01	-----
FLUORANTHENE	N.D.	0.01	-----
PYRENE	N.D.	0.01	-----
BUTYLBENZYLPHTHALATE	N.D.	0.01	-----
3,3'-DICHLOROBENZIDINE	N.D.	0.02	-----
BENZO(A)ANTHRACENE	N.D.	0.01	-----
BIS(2-ETHYLHEXYL)PHTHALATE	N.D.	0.01	-----
CHRYSENE	N.D.	0.01	107.0%
DI-N-OCTYLPHTHALATE	N.D.	0.01	-----
BENZO(B)FLUORANTHENE	N.D.	0.01	-----
BENZO(K)FLUORANTHENE	N.D.	0.01	-----
BENZO(A)PYRENE	N.D.	0.01	-----
INDENO(1,2,3 C,D)PYRENE	N.D.	0.01	-----
DIBENZO(A,H)ANTHRACENE	N.D.	0.01	-----
BENZO(G,H,I)PERYLENE	N.D.	0.01	-----

ChromaLab, Inc.

David Duong
Senior Chemist

Eric Tam
Lab Director

ANAMETRIX INC

REPORT

Mike Barminsky
Applied GeoSystems - San Jose
3315 Almaden Expressway
Suite 34
San Jose, CA 95118

July 06, 1990
Anametrix W.O.#: 9006343
Date Received : 06/27/90
Project Number : 69038-2

Dear Mr. Barminsky:

Your sample has been received for analysis. The REPORT SUMMARY lists your sample identifications and the analytical methods you requested. The following sections are included in this report: RESULTS and QUALITY ASSURANCE.

NOTE: Amounts reported are net values, i.e. corrected for method blank contamination.

If there is any more that we can do, please give us a call. Thank you for using ANAMETRIX, INC.

Sincerely,

ANAMETRIX, INC.

Manny Nguyen FOR

Refaat Mankarious
Inorganics Supervisor

RM/dag

REPORT SUMMARY
ANAMETRIX, INC. (408) 432-8192

Client	: Applied GeoSystems - San Jose	Anametrix W.O.#:	9006343
Address	: 3315 Almaden Expressway	Date Received :	06/27/90
	Suite 34	Purchase Order#:	N/A
City	: San Jose, CA 95118	Project No. :	69038-2
Attn.	: Mike Barminsky	Date Released :	07/06/90

Anametrix I.D.	Sample I.D.	Matrix	Date Sampled	Method	Date Extract	Date Analyzed	Inst I.D.
RESULTS							
9006343-01	SP-0619-1(A,B,C,D	SOIL	06/27/90	ORG Pb		07/05/90	AA1
QUALITY ASSURANCE (QA)							
OMB070590S	METHOD BLANK	SOIL	N/A	ORG Pb		07/05/90	AA1

ANALYSIS DATA SHEET - ORGANIC LEAD
ANAMETRIX, INC. - (408) 432-8192

Anametrix W.O.: 9006343
Matrix : SOIL
Date Sampled : 06/27/90
Project Number: 69038-2

Date Prepared : 07/05/90
Date Analyzed : 07/05/90
Date Released : 07/06/90
Instrument I.D.: AA1

ANAMETRIX ID	CLIENT ID	ELEMENTS: Organic Lead EPA METHOD: LUFT REPORTING LIMIT: 0.08 (mg/Kg)
9006343-01	SP-0619-(A,B, C,D)	ND
OMB070590S	METHOD BLANK	ND

ND : Not detected at or above the practical quantitation limit for the method.

Organic Lead by Leadking Underground Fuel Tank (LUFT) Manual, 1987 California State Water Resources Control Board.

Mony Kamel 7/06/90
Analyst Date

Manny Nguyen 7/06/90
Supervisor Date

ANAMETRIX, INC.
1961 Concourse Drive, #E, San Jose, CA. 95131
(408) 432-8192
LOG IN FORM and INTERNAL CHAIN OF CUSTODY

D.G.

ANAMETRIX
workorder: # 9006343 p.o #: N/A
report to: APPLIED GEO SYSTEMS - SAN JOSE project #: 69038-2
3315 ALMADEN EXPRESSWAY SUITE 34
SAN JOSE, CA 95118

date received: 06/27/90
date due : 07/05/90

phone # : (408)264-7723
fax phone: (408)264-2435
attention: ~~MIKE CYROCKI~~ ~~Bill Dugan~~ D.G. 6/28/90 MIKE BARMINSKY

WORKORDER	SAMPLE ID	MATRIX	METHOD	FRIG ID#	CONTAINER	DATE SAMPLED
9006343- 1	SP-0619-1(A ,B,C,D)	SOIL	ORG Pb	10/24	4 X 1BL	06/27/90

COMMENTS : 1 WEEK RUSH. ANALYSIS REQUIRED IS FOR ORGANIC LEAD. SAMPLE IS A COMPOSITE OF 4 BRASS LINERS. THANKS.KD.

1

Custodian's Signature Kilma Desai

Date/Time into Refrigerator 6-27-90 12:45

Applied GeoSystems

(10/24) 12:45

CHAIN-OF-CUSTODY RECORD

PROJ. NO.	PROJECT NAME
69531.24	
P.O. NO.	SAMPLERS (Signature)

DATE MM/DD/YY	TIME	SAMPLE I.D.	No. of Containers	ANALYSIS: TPHg	BTEX	TPHd	Organic Lead					Preserved?	LABORATORY I.D. NUMBER
6/9/00		SP-0614-1(A,B,C,D)	4				✓						

RELINQUISHED BY (Signature):	DATE / TIME: 6-27-00 900	RECEIVED BY (Signature):
RELINQUISHED BY (Signature):	DATE / TIME:	RECEIVED BY (Signature):
RELINQUISHED BY (Signature):	DATE / TIME:	RECEIVED FOR LABORATORY BY (Signature):

REMARKS:

Anametrix

1 weeks.

SEND RESULTS TO:

Applied GeoSystems

3315 Almaden Expressway
Suite 34
San Jose, California 95118
(408) 264-7723

Proj. Mgr.: ~~Mike Lycoeki~~ Bill Dilgard

Applied GeoSystems

CHAIN-OF-CUSTODY RECORD

PROJ. NO.	PROJECT NAME
69038-2	ARCO 4494
P.O. NO.	SAMPLERS (Signature)
	Steve Strom

DATE MM/DD/YY	TIME		No. of Containers	TPHgasoline (8015)	BTEX (602/8020)	TPHdiesel (8015)	VOC (624)	BNA (625)	Organic Lead	Pb, Cd, Zn (6010)	Preserved?	REMARKS	LABORATORY I.D. NUMBER
8/16/90	1620	W-8-MW1	12	X	X								
8/16/90	1620	MW-1, Rinsate Blank	1	X	X							hold if results of W-8-MW1 indicate ND	
8/16/90	2000	W-10-MW3	12	X	X	X	X	X	X	X			
8/16/90	2000	MW-3, Rinsate Blank	1	X	X							hold if results on W-10-MW3 are ND	
8/16/90	1810	W-9-MW4	12	X	X	X	X	X	X	X			
8/16/90	1810	MW-4, Rinsate Blank	1	X	X							hold if results of W-9-MW4 are ND	

RELINQUISHED BY (Signature):	DATE / TIME	RECEIVED BY (Signature):	Laboratory:	SEND RESULTS TO:
Steve Strom	8/17/90 12:04	[illegible] X660		Applied GeoSystems 3315 Almaden Expressway Suite 34 San Jose, California 95118 (408) 264-7723
RELINQUISHED BY (Signature):	DATE / TIME	RECEIVED BY (Signature):	Turn Around:	Proj. Mgr.:
RELINQUISHED BY (Signature):	DATE / TIME	RECEIVED FOR LABORATORY BY (Signature):		

Applied GeoSystems

CHAIN-OF-CUSTODY RECORD

PROJ. NO.	PROJECT NAME
69038-2	ARCO 4494
P.O. NO.	SAMPLERS (Signature)
	Steve Strom

DATE MM/DD/YY	TIME		No. of Containers	TPHgasoline (8015)	BTEX (602/8020)	TPHdiesel (8015)	VOC (624)	BNA (625)	Organic Lead	Pb, Cd, Cr, Zn (6010)		Preserved?	REMARKS	LABORATORY I.D. NUMBER
8/16/90	1620	W-8-MW1	12	X	X									
8/16/90	1620	MW-1, Rinsate Blank	1	X	X								hold if results of W-8-MW1 indicate ND	
8/16/90	2000	W-10-MW3	12	X	X	X	X	X	X	X				
8/16/90	2000	MW-3, Rinsate Blank	1	X	X								hold if results on W-10-MW3 are ND	
8/16/90	1810	W-9-MW4	12	X	X	X	X	X	X	X				
8/16/90	1810	MW-4, Rinsate Blank	1	X	X								hold if results of W-9-MW4 are ND	

RELINQUISHED BY (Signature):	DATE / TIME	RECEIVED BY (Signature):
Steve Strom	8/17/90 12:04	[signature]
RELINQUISHED BY (Signature):	DATE / TIME	RECEIVED BY (Signature):
RELINQUISHED BY (Signature):	DATE / TIME	RECEIVED FOR LABORATORY BY (Signature):
[signature]	8/17	Laura Kirk

Laboratory: APPLIED ANALYTICAL

Turn Around: 2 weeks

SEND RESULTS TO:

Applied GeoSystems
3315 Almaden Expressway
Suite 34
San Jose, California 95118
(408) 264-7723

Proj. Mgr.: Ken Makik

APPLIED ANALYTICAL

Environmental Laboratories

42501 Albrae St., Suite 100
Fremont, CA 94538
Bus: (415) 623-0775
Fax: (415) 651-8647

ANALYSIS REPORT

1020lab.frm

Attention: Mr. Ken Mateik
Applied GeoSystems
3315 Almaden Expressway
San Jose, CA 95118
Project: AGS 69038-2

Date Sampled: 08-16-90
Date Received: 08-17-90
BTEX Analyzed: 08-17-90
TPHg Analyzed: 08-17-90
TPHd Analyzed: 08-24-90
Matrix: Water

	Benzene	Toluene	Ethyl-benzene	Total Xylenes	TPHg	TPHd
	ppb	ppb	ppb	ppb	ppb	ppb
Detection Limit:	0.5	0.5	0.5	0.5	20	100
SAMPLE Laboratory Identification						
W-8-MW1 W1008181	ND	ND	ND	ND	ND	NR
W-10-MW3 W1008182	ND	ND	ND	ND	ND	ND
W-9-MW4 W1008183	ND	ND	ND	ND	ND	ND

ppb = parts per billion = µg/L = micrograms per liter.
ND = Not detected. Compound(s) may be present at concentrations below the detection limit.
NR = Analysis not requested.

ANALYTICAL PROCEDURES

BTEX– Benzene, toluene, ethylbenzene, and total xylene isomers (BTEX) are measured by extraction using EPA Method 5030 followed by analysis using EPA Method 8020/602, which utilizes a gas chromatograph (GC) equipped with a photoionization detector (PID) and a flame-ionization detector (FID) in series.

TPHg–Total petroleum hydrocarbons as gasoline (low-to-medium boiling points) are measured by extraction using EPA Method 5030, followed by analysis using modified EPA Method 8015, which utilizes a GC equipped with an FID.

TPHd–Total petroleum hydrocarbons as diesel (high boiling points) are measured by extraction using EPA Method 3550 for soils and EPA Method 3510 for water, followed by modified EPA Method 8015 with direct sample injection into a GC equipped with an FID.

Laboratory Representative

August 27, 1990
Date Reported

APPLIED ANALYTICAL

Environmental Laboratories

42501 Albrae St., Suite 100
Fremont, CA 94538
Bus: (415) 623-0775
Fax: (415) 651-8647

ANALYSIS REPORT

1020lab.frm

Attention:	Mr. Ken Mateik	Date Sampled:	08-16-90
	Applied GeoSystems	Date Received:	08-17-90
	3315 Almaden Expressway	Date Extracted:	08-23-90
	San Jose, CA 95118	Date Analyzed:	08-24-90
Project:	AGS 69038-2	Matrix:	WATER

	Cadmium	Chromium	Lead	Zinc
	ppm	ppm	ppm	ppm
Detection Limit:	0.01	0.02	0.02	0.01
SAMPLE Laboratory Identification				
W-9-MW4 W1008183	ND	ND	ND	0.03
W-10-MW3 W1008182	ND	0.06	0.07	0.07

ppm = parts per million = mg/kg = milligrams per kilogram.
ND = Not detected. Compound(s) may be present at concentrations below the detection limit.
NR = Analysis not requested.

ANALYTICAL PROCEDURES

All metals are extracted and analyzed according to EPA method 200.7.

Laura Kuk
Laboratory Representative

08-27-90
Date Reported

Appli.. GeoSystems

CHAIN-OF-CUSTODY RECORD

PROJ. NO.	PROJECT NAME
69038-2	ARCO 4494
P.O. NO.	SAMPLERS (Signature)

CHROMALAB FILE # 890209

DATE MM/DD/YY	TIME	SAMPLE I.D.	No. of Containers	TPHg	BTEX	TPHd	624	625	Organic Pb			Preserved?	LABORATORY I.D. NUMBER
8/16/90	1620	———										ICE	
↓	2000	W-10-MW3	5-40ml				X	X	X			↓	
↓	1810	W-9-MW4					X	X	X			↓	

RELINQUISHED BY (Signature):	DATE / TIME	RECEIVED BY (Signature):	REMARKS:	SEND RESULTS TO:
Laura Kirk	8/21/90 10:00		Chromalab	**Applied GeoSystems** 3315 Almaden Expressway Suite 34 San Jose, California 95118 (408) 264-7723
RELINQUISHED BY (Signature):	DATE / TIME	RECEIVED BY (Signature):		
RELINQUISHED BY (Signature):	DATE / TIME	RECEIVED FOR LABORATORY BY (Signature): Jane Winkett 8 21 90 1:40	Normal TAT	Proj. Mgr.: Ken MateiK

CHROMALAB, INC.

Analytical Laboratory
Specializing in GC-GC/MS

- Environmental Analysis
- Hazardous Waste (#E694)
- Drinking Water (#955)
- Waste Water
- Consultation

September 4, 1990 ChromaLab File # 0890209A

Client: APPLIED GECSYSTEMS, INC. Attn: Ken Mateik

Date Sampled: Aug. 16, 1990 Date Submitted: Aug. 21, 1990
Date of Analysis: Aug. 30, 1990
Project Name: Arco 4494 Project No.: 69038-2
Sample I.D.: W-10-MW3
Method of Analysis: EPA 624 Detection Limit: 4 µg/L

COMPOUND NAME	µg/L	Spike Recovery
CHLOROMETHANE	N.D	---
VINYL CHLORIDE	N.D.	---
BROMOMETHANE	N.D.	---
CHLOROETHANE	N.D.	---
TRICHLOROFLUOROMETHANE	N.D.	---
1,1-DICHLOROETHENE	N.D.	---
METHYLENE CHLORIDE	N.D.	97.2% 101.3%
1,2-DICHLOROETHENE (TOTAL)	N.D.	---
1,1-DICHLOROETHANE	N.D.	---
CHLOROFORM	N.D.	---
1,1,1-TRICHLOROETHANE	N.D.	---
CARBON TETRACHLORIDE	N.D.	---
BENZENE	N.D.	---
1,2-DICHLOROETHANE	N.D.	---
TRICHLOROETHENE	N.D.	89.9% 95.7%
1,2-DICHLOROPROPANE	N.D.	---
BROMODICHLOROMETHANE	N.D.	---
2-CHLOROETHYLVINYLETHER	N.D.	---
TRANS-1,3-DICHLOROPROPENE	N.D.	---
TOLUENE	N.D.	---
CIS-1,3-DICHLOROPROPENE	N.D.	---
1,1,2-TRICHLOROETHANE	N.D.	---
TETRACHLOROETHENE	N.D.	101.3% 93.7%
DIBROMOCHLOROMETHANE	N.D.	---
CHLOROBENZENE	N.D.	---
ETHYL BENZENE	N.D.	---
BROMOFORM	N.D.	---
1,1,2,2-TETRACHLOROETHANE	N.D.	---
1,3-DICHLOROBENZENE	N.D.	---
1,4-DICHLOROBENZENE	N.D.	---
1,2-DICHLOROBENZENE	N.D.	95.8% 95.2%
TOTAL XYLENES	N.D.	---

ChromaLab, Inc.

David Duong
Senior Chemist

Eric Tam
Lab Director

2239 Omega Road, #1 • San Ramon, California 94583
415/831-1788 • Facsimile 415/831-8798
Federal ID #68-0140157

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- Environmental Analysis
- Hazardous Waste (#E694)
- Drinking Water (#955)
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- Consultation

September 4, 1990 — ChromaLab File # 0890209A

Client: APPLIED GEOSYSTEMS, INC. — Attn: Ken Mateik

Date Sampled: Aug. 16, 1990 — Date Submitted: Aug. 21, 1990
Date of Analysis: Aug. 30, 1990
Project Name: Arco 4494 — Project No.: 69038-2
Sample I.D.: W-10-MW3
Method of Analysis: EPA 625 — Matrix: Water

COMPOUND NAME	Sample mg/L	MDL mg/L	Spike Recovery
2,4-DINITROTOLUENE	N.D.	0.01	----
2,6-DINITROTOLUENE	N.D.	0.01	103.1%
DIETHYL PHTHALATE	N.D.	0.01	----
4-CHLORO-PHENYL PHENYL ETHER	N.D.	0.01	----
FLUORENE	N.D.	0.01	----
4-NITROANILINE	N.D.	0.01	----
4,6-DINITRO-2-METHYL PHENOL	N.D.	0.01	----
N-NITROSODIPHENYLAMINE	N.D.	0.01	----
4-BROMOPHENYL PHENYL ETHER	N.D.	0.01	----
HEXACHLOROBENZENE	N.D.	0.01	93.7%
PENTACHLOROPHENOL	N.D.	0.01	----
PHENANTHRENE	N.D.	0.01	----
ANTHRACENE	N.D.	0.01	----
DI-N-BUTYL PHTHALATE	N.D.	0.01	----
FLUORANTHENE	N.D.	0.01	----
PYRENE	N.D.	0.01	----
BUTYLBENZYLPHTHALATE	N.D.	0.01	----
3,3'-DICHLOROBENZIDINE	N.D.	0.01	----
BENZO (A) ANTHRACENE	N.D.	0.01	----
BIS(2-ETHYHEXYL)PHTHALATE	N.D.	0.01	----
CHRYSENE	N.D.	0.01	----
DI-N-OCTYLPHTHALATE	N.D.	0.01	----
BENZO (B) FLUORANTHENE	N.D.	0.01	97.1%
BENZO (K) FLUORANTHENE	N.D.	0.01	----
BENZO (A) PYRENE	N.D.	0.01	----
INDENO (1,2,3 C,D) PYRENE	N.D.	0.01	----
DIBENZO (A,H) ANTHRACENE	N.D.	0.01	----
BENZO (G,H,I) PERYLENE	N.D.	0.01	----

CHROMALAB, INC.

David Duong
Senior Chemist

Eric Tam
Lab Director

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Analytical Laboratory
Specializing in GC-GC/MS

- Environmental Analysis
- Hazardous Waste (#E694)
- Drinking Water (#955)
- Waste Water
- Consultation

September 4, 1990 — ChromaLab File # 0890209B

Client: APPLIED GEOSYSTEMS, INC. Attn: Ken Mateik

Date Sampled: Aug. 16, 1990 — Date Submitted: Aug. 21, 1990
Date of Analysis: Aug. 30, 1990
Project Name: Arco 4494 — Project No.: 69038-2
Sample I.D.: W-9-MW4
Method of Analysis: EPA 624 — Detection Limit: 4 µg/L

COMPOUND NAME	µg/L	Spike Recovery
CHLOROMETHANE	N.D	---
VINYL CHLORIDE	N.D.	---
BROMOMETHANE	N.D.	---
CHLOROETHANE	N.D.	---
TRICHLOROFLUOROMETHANE	N.D.	---
1,1-DICHLOROETHENE	N.D.	---
METHYLENE CHLORIDE	N.D.	97.2% 101.3%
1,2-DICHLOROETHENE (TOTAL)	N.D.	---
1,1-DICHLOROETHANE	N.D.	---
CHLOROFORM	N.D.	---
1,1,1-TRICHLOROETHANE	N.D.	---
CARBON TETRACHLORIDE	N.D.	---
BENZENE	N.D.	---
1,2-DICHLOROETHANE	N.D.	---
TRICHLOROETHENE	N.D.	89.9% 95.7%
1,2-DICHLOROPROPANE	N.D.	---
BROMODICHLOROMETHANE	N.D.	---
2-CHLOROETHYLVINYLETHER	N.D.	---
TRANS-1,3-DICHLOROPROPENE	N.D.	---
TOLUENE	N.D.	---
CIS-1,3-DICHLOROPROPENE	N.D.	---
1,1,2-TRICHLOROETHANE	N.D.	---
TETRACHLOROETHENE	N.D.	101.3% 93.7%
DIBROMOCHLOROMETHANE	N.D.	---
CHLOROBENZENE	N.D.	---
ETHYL BENZENE	N.D.	---
BROMOFORM	N.D.	---
1,1,2,2-TETRACHLOROETHANE	N.D.	---
1,3-DICHLOROBENZENE	N.D.	---
1,4-DICHLOROBENZENE	N.D.	---
1,2-DICHLOROBENZENE	N.D.	95.8% 95.2%
TOTAL XYLENES	N.D.	---

ChromaLab, Inc.

David Duong
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September 4, 1990 — ChromaLab File # 0890209B

Client: APPLIED GEOSYSTEMS, INC. — Attn: Ken Mateik

Date Sampled: Aug. 16, 1990 — Date Submitted: Aug. 21, 1990
Date of Analysis: Aug. 30, 1990
Project Name: Arco 4494 — Project No.: 69038-2
Sample I.D.: W-9-MW4
Method of Analysis: EPA 625 — Matrix: Water

COMPOUND NAME	Sample mg/L	MDL mg/L	Spike Recovery
PHENOL	N.D.	0.01	88.7%
BIS(2-CHLOROETHYL) ETHER	N.D.	0.01	----
2-CHLOROPHENOL	N.D.	0.01	----
1,3-DICHLOROBENZENE	N.D.	0.01	----
1,4-DICHLOROBENZENE	N.D.	0.01	----
BENZYL ALCOHOL	N.D.	0.01	----
1,2-DICHLOROBENZENE	N.D.	0.01	----
2-METHYLPHENOL	N.D.	0.01	----
BIS(2-CHLOROISOPROPYL) ETHER	N.D.	0.01	----
4-METHYLPHENOL	N.D.	0.01	----
N-NITROSO-DI-N-PROPYLAMINE	N.D.	0.01	----
HEXACHLOROETHANE	N.D.	0.01	----
NITROBENZENE	N.D.	0.01	----
ISOPHORONE	N.D.	0.01	----
2-NITROPHENOL	N.D.	0.01	----
2,4-DIMETHYPHENOL	N.D.	0.01	----
BENZOIC ACID	N.D.	0.01	----
BIS(2-CHLOROETHOXY) METHANE	N.D.	0.01	----
2,4-DICHLOROPHENOL	N.D.	0.01	----
1,2,4-TRICHLOROBENZENE	N.D.	0.01	----
NAPHTHALENE	N.D.	0.01	103.1%
4-CHLOROANILINE	N.D.	0.01	----
HEXACHLOROBUTADIENE	N.D.	0.01	----
4-CHLORO-3-METHYLPHENOL	N.D.	0.01	----
2-METHYLNAPHTHALENE	N.D.	0.01	----
HEXACHLOROCYCLOPENTADIENE	N.D.	0.01	----
2,4,6-TRICHLOROPHENOL	N.D.	0.01	----
2,4,5-TRICHLOROPHENOL	N.D.	0.01	----
2-CHLORONAPHTHALENE	N.D.	0.01	----
2-NITROANILINE	N.D.	0.01	----
DIMETHYL PHTHALATE	N.D.	0.01	----
ACENAPHTHYLENE	N.D.	0.01	----
3-NITROANILINE	N.D.	0.01	----
ACENAPHTHENE	N.D.	0.01	95.2%
2,4-DINITROPHENOL	N.D.	0.01	----
4-NITROPHENOL	N.D.	0.01	----
DIBENZOFURAN	N.D.	0.01	----

(continued on next page)

2239 Omega Road, #1 • San Ramon, California 94583
415/831-1788 • Facsimile 415/831-8798
Federal ID #68-0140157

CHROMALAB, INC.

Analytical Laboratory
Specializing in GC-GC/MS

- Environmental Analysis
- Hazardous Waste (#E694)
- Drinking Water (#955)
- Waste Water
- Consultation

September 4, 1990 ChromaLab File # 0890209B

Client: APPLIED GEOSYSTEMS, INC. Attn: Ken Mateik

Date Sampled: Aug. 16, 1990 Date Submitted: Aug. 21, 1990
Date of Analysis: Aug. 30, 1990
Project Name: Arco 4494 Project No.: 69038-2
Sample I.D.: W-9-MW4
Method of Analysis: EPA 625 Matrix: Water

COMPOUND NAME	Sample mg/L	MDL mg/L	Spike Recovery
2,4-DINITROTOLUENE	N.D.	0.01	----
2,6-DINITROTOLUENE	N.D.	0.01	103.1%
DIETHYL PHTHALATE	N.D.	0.01	----
4-CHLORO-PHENYL PHENYL ETHER	N.D.	0.01	----
FLUORENE	N.D.	0.01	----
4-NITROANILINE	N.D.	0.01	----
4,6-DINITRO-2-METHYL PHENOL	N.D.	0.01	----
N-NITROSODIPHENYLAMINE	N.D.	0.01	----
4-BROMOPHENYL PHENYL ETHER	N.D.	0.01	----
HEXACHLOROBENZENE	N.D.	0.01	93.7%
PENTACHLOROPHENOL	N.D.	0.01	----
PHENANTHRENE	N.D.	0.01	----
ANTHRACENE	N.D.	0.01	----
DI-N-BUTYL PHTHALATE	N.D.	0.01	----
FLUORANTHENE	N.D.	0.01	----
PYRENE	N.D.	0.01	----
BUTYLBENZYLPHTHALATE	N.D.	0.01	----
3,3'-DICHLOROBENZIDINE	N.D.	0.01	----
BENZO (A) ANTHRACENE	N.D.	0.01	----
BIS(2-ETHYHEXYL)PHTHALATE	N.D.	0.01	----
CHRYSENE	N.D.	0.01	----
DI-N-OCTYLPHTHALATE	N.D.	0.01	----
BENZO (B) FLUORANTHENE	N.D.	0.01	97.1%
BENZO (K) FLUORANTHENE	N.D.	0.01	----
BENZO (A) PYRENE	N.D.	0.01	----
INDENO (1,2,3 C,D) PYRENE	N.D.	0.01	----
DIBENZO (A,H) ANTHRACENE	N.D.	0.01	----
BENZO (G,H,I) PERYLENE	N.D.	0.01	----

CHROMALAB, INC.

David Duong
Senior Chemist

Eric Tam
Lab Director

Applied GeoSystems

CHAIN-OF-CUSTODY RECORD

PROJ. NO.	PROJECT NAME
69038-2	ARCO 4494
P.O. NO.	SAMPLERS (Signature)
	Steve Strauss

DATE MM/DD/YY	TIME		No. of Containers	TPHgasoline (8015)	BTEX (602/8020)	TPHdiesel (8015)	TOG (SM 503E)				Iced	Preserved?	REMARKS	LABORATORY I.D. NUMBER
				ANALYSIS										
9/7/90	1940	W-10-MW1	2				X				X			
9/7/90	1700	W-10-MW3	2				X				X			
9/7/90	1835	W-10-MW4	2				X				X			

RELINQUISHED BY (Signature):	DATE / TIME	RECEIVED BY (Signature):
Steve Strauss	9/10 8:22	Ken Mateik
RELINQUISHED BY (Signature):	DATE / TIME	RECEIVED BY (Signature):
Ken Mateik	9/10 9:45	
RELINQUISHED BY (Signature):	DATE / TIME	RECEIVED FOR LABORATORY BY (Signature):
	9/10 1205	

Laboratory: Applied Analytical

Turn Around: 2 weeks

SEND RESULTS TO:

Applied GeoSystems
3315 Almaden Expressway
Suite 34
San Jose, California 95118
(408) 264-7723

Proj. Mgr.: KEN MATEIK

APPLIED ANALYTICAL

Environmental Laboratories

42501 Albrae St., Suite 100
Fremont, CA 94538
Bus: (415) 623-0775
Fax: (415) 651-8647

ANALYSIS REPORT

togwater.rpt

Report Prepared for:
Applied GeoSystems
3315 Almaden Expressway
San Jose, CA 95118
Attention: Ken Mateik

Date Received: 09-10-90
Laboratory #: W1009051
Project #: 69038-2
Sample #: W-10-MW1
Matrix: Water

Parameter	Result (µg/L)	Detection Limit (µg/L)	Date Analyzed
TPH as Oil and Grease	ND	5000	09-11-90

µg/L = micrograms per liter = ppb
ND = Not detected. Compound(s) may be present at concentrations below the detection limit.

PROCEDURES

TPH as Oil and Grease: Total Oil and Grease of mineral or petroleum origin are measured by extraction and gravimetric analysis according to Standard Method 503A/E.

Laura Kuck, Laboratory Manager

September 18, 1990
Date Reported

APPLIED ANALYTICAL

Environmental Laboratories

42501 Albrae St., Suite 100
Fremont, CA 94538
Bus: (415) 623-0775
Fax: (415) 651-8647

ANALYSIS REPORT

togwater.rpt

Report Prepared for:
Applied GeoSystems
3315 Almaden Expressway
San Jose, CA 95118
Attention: Ken Mateik

Date Received: 09-10-90
Laboratory #: W1009052
Project #: 69038-2
Sample #: W-10-MW3
Matrix: Water

Parameter	Result (µg/L)	Detection Limit (µg/L)	Date Analyzed
TPH as Oil and Grease	ND	5000	09-11-90

µg/L = micrograms per liter = ppb
ND = Not detected. Compound(s) may be present at concentrations below the detection limit.

PROCEDURES

TPH as Oil and Grease: Total Oil and Grease of mineral or petroleum origin are measured by extraction and gravimetric analysis according to Standard Method 503A/E.

Laura Kuck, Laboratory Manager

September 18, 1990
Date Reported

APPLIED ANALYTICAL

Environmental Laboratories

42501 Albrae St., Suite 100
Fremont, CA 94538
Bus: (415) 623-0775
Fax: (415) 651-8647

ANALYSIS REPORT

togwater.rpt

Report Prepared for:
Applied GeoSystems
3315 Almaden Expressway
San Jose, CA 95118
Attention: Ken Mateik

Date Received: 09-10-90
Laboratory #: W1009053
Project #: 69038-2
Sample #: W-10-MW4
Matrix: Water

Parameter	Result (µg/L)	Detection Limit (µg/L)	Date Analyzed
TPH as Oil and Grease	ND	5000	09-11-90

µg/L = micrograms per liter = ppb
ND = Not detected. Compound(s) may be present at concentrations below the detection limit.

PROCEDURES

TPH as Oil and Grease: Total Oil and Grease of mineral or petroleum origin are measured by extraction and gravimetric analysis according to Standard Method 503A/E.

Laura Kuck, Laboratory Manager

September 18, 1990
Date Reported

2131

NON-HAZARDOUS WASTE DATA FORM

TO BE COMPLETED BY GENERATOR

NAME ARCO Products Attn: Kyle Christie

ADDRESS P. O. Box 5811 EPA I.D. NO. E P A E X E M P T

CITY, STATE, ZIP San Mateo, Ca. 94402 Site:566 Hegenburger, Oakland Station: #4494 PHONE NO 415 571-2434

CONTAINERS: No. 100968 VOLUME 1½ Y WEIGHT

TYPE: ☐ TANK TRUCK ☒ DUMP TRUCK ☐ DRUMS ☐ CARTONS ☐ OTHER

WASTE DESCRIPTION Soil with Gasoline GENERATING PROCESS drill cuttings

COMPONENTS OF WASTE	PPM	%	COMPONENTS OF WASTE	PPM	%
1. Soil		99.9	5.		
2. Gasoline		<0.1	6.		
3.			7.		
4.			8.		

PROPERTIES: pH Neutral ☒ SOLID ☐ LIQUID ☐ SLUDGE ☐ SLURRY ☐ OTHER

HANDLING INSTUCTIONS: Approval 070690-428 Station #4494

THE GENERATOR CERTIFIES THAT THE WASTE AS DESCRIBED IS 100% NON-HAZARDOUS.

K L [illegible] 7-6-90

TYPED OR PRINTED FULL NAME & SIGNATURE DATE

TRANSPORTER

NAME Dillard Trucking, Inc. EPA I.D. NO. C A D 9 8 1 6 9 2 8 0 9

ADDRESS Route 1 Box 73 SERVICE ORDER NO.

CITY, STATE, ZIP Byron, California 94544 PICK UP DATE 7-6-90

PHONE NO. (415) 634-0567

TRUCK, UNIT I.D. NO. 13 Jr. Rogers Jr Rogers 7-6-90

TYPED OR PRINTED FULL NAME & SIGNATURE DATE

TSD FACILITY

NAME Liquid Waste Management, Inc. EPA I.D. NO. C A D 9 8 0 6 3 6 8 3 1

ADDRESS Star Route Box 4 DISPOSAL METHOD ☒ LANDFILL ☐ OTHER

CITY, STATE, ZIP McKittrick, Ca. 93251

PHONE NO. 805 762-7366

MARTHA DOLE Martha Dole 7-6-90

TYPED OR PRINTED FULL NAME & SIGNATURE DATE

GEN	OLD/NEW	L A	TONS 1.87		
TRANS		S B			
C/O		RT/CD	HWOF NONE	DISCREPANCY	Ph, 6.0

Class II Landfill