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REPORT ON OFFSITE SUBSURFACE ENVIRONMENTAL INVESTIGATION

at

ARCO Station 374
6407 Telegraph Avenue
Oakland, California

60025.05

Prepared for
ARCO Products Company
P.O. Box 5811
San Mateo, California
by
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September 22, 1992

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TRANSMITTAL

TO: Ms. Susan Hugo
Alameda County Health Care Services
80 Swan Way, Room 200
Oakland, California 94621

DATE: September 23, 1992
PROJECT NUMBER: 60025.06
SUBJECT: Final - Report on Onsite Environmental Subsurface Investigation at ARCO Station 374, 6407 Telegraph Avenue, Oakland, California.

FROM: Ken Mateik
TITLE: Project Geologist

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REPORT ON SUPPLEMENTAL SUBSURFACE ENVIRONMENTAL INVESTIGATION at ARCO Station 374 6407 Telegraph Avenue Oakland, California

INTRODUCTION

At the request of ARCO Products Company (ARCO), RESNA Industries Inc. (RESNA) performed an offsite subsurface environmental investigation at ARCO Station 374, located at 6407 Telegraph Avenue in Oakland, California. This investigation was initiated by RESNA (formerly Applied GeoSystems [AGS]) in response to the results of previous investigations conducted at the site. The purpose of this investigation was to further delineate the downgradient extent of gasoline hydrocarbon-impacted soil and groundwater offsite, identify past owner(s) of the abandoned upgradient/crossgradient station, and to identify other possible offsite sources of groundwater contamination in the immediate vicinity of the site.

The work performed for this investigation included drilling two soil borings, collecting and describing soil samples from the borings, installing and developing two 4-inch diameter groundwater monitoring wells in the borings, measuring groundwater levels, sampling groundwater from the monitoring wells, laboratory analysis of selected soil and groundwater samples, surveying wellhead elevations, conducting a limited environmental records search of potential offsite secondary sources for hydrocarbons within a one mile radius of the site, and preparing this report presenting field procedures, results and conclusions. This work was performed as outlined in the RESNA/AGS Work Plan (RESNA/AGS, May 15, 1991) and Addendum One to Work Plan (RESNA/AGS, May 15, 1991).

SITE DESCRIPTION AND BACKGROUND

General

ARCO Station 374 is located at the northwestern corner of the intersection of Telegraph and Alcatraz Avenues in Oakland, California. The location is shown on Plate 1, Site Vicinity Map. Plate 2 shows the pertinent site features which include two service islands, a station building, new underground gasoline-storage tanks (USTs) in the northeastern part of the site, and the location of the former gasoline USTs in the southwestern part of the site. Numerous small commercial businesses and residential apartments are located along Telegraph and Alcatraz Avenues. Residential apartment buildings are located west and north of the site. A vacant lot, formerly a Mobile Oil Service Station, 6398 Telegraph Avenue, is located at the southeastern corner of the intersection. The surface topography in the area is relatively flat, sloping very gently to the southeast.

Regional and Local Hydrogeology

ARCO Station 374 is located west of the East Bay Hills at an elevation of approximately 160 feet above mean sea level. This area lies within the Berkeley Alluvial Plain, which is a subarea of the East Bay Alluvial Plain. Soils in this area are mapped as older alluvium that consists of a heterogeneous mixture of poorly consolidated to unconsolidated clay, silt, sand, and gravel units (Helley, 1979). The sediments were derived mainly from the hills to the east and southeast and represent successive coalescing alluvial fans deposited during the Pleistocene epoch.

The sediments found beneath the East Bay Alluvial Plain are believed to be about 200 feet thick in the Berkeley area and are the major groundwater source in the region. Water-yielding capabilities are highly variable. Generally, high yields come only from wells that extend through several of the sand and gravel beds. Groundwater in the East Bay Plain occurs predominantly under confined conditions and tends to flow toward San Francisco Bay to the west and southwest (Hickenbottom and Muir, 1988).

PREVIOUS WORK

Subsurface Investigations

In February 1988, a leak was detected in the vapor/vent line of the unleaded system during annual tank testing. In April 1988, an UST Unauthorized Release (Leak) Report addressing the vapor/vent line was filed with the Alameda County Public Health Service by Brown and Caldwell. In April 1988, AGS began a limited environmental site assessment at the site which included drilling four soil borings (B-1 through B-4) near the underground gasoline storage tanks (AGS, June 15, 1988). The results of this investigation indicated total petroleum hydrocarbons as gasoline (TPHg) concentrations ranging from 48 to 930 parts per million (ppm). These laboratory results are summarized in Table 1. Groundwater was encountered at approximately 10 feet in the borings. One inch of floating product was observed in a "grab" groundwater sample collected from boring B-1. Product sheen was observed on "grab" groundwater samples from borings B-2 and B-4. The locations of the borings are shown on Plate 2.

Between June 7 and 10, 1988, the four gasoline USTs were removed from the site (AGS, August 1, 1988); there was no known waste-oil tank on the site. No holes were observed in the removed tanks; however, some of the tar coating had dissolved around the fill ports of the tanks. Laboratory analyses of the soil samples collected beneath former tank T4 indicated TPHg concentrations ranging from 3 ppm to 1,097 ppm. The excavation was extended north of tank T4; a soil sample (S-12-T4A2) collected after this excavation indicated a TPHg concentration of 795 ppm. A soil sample collected beneath the north end of the tank T1 (S-11-T1A) indicated a TPHg concentration of 399 ppm. Results of laboratory analyses of the soil samples are summarized in Table 1. Groundwater was observed seeping into the northwestern portion of the UST pit at a depth of approximately 12 feet. Analysis of a composite soil sample collected from the new UST pit excavation in the northeastern portion of the site indicated nondetectable concentrations of TPHg (less than 2 ppm). Observation wells W-1 and W-2 were installed in the former UST pit; observation wells W-3 and W-4 were installed in the new UST pit. Subjective analyses of the water from these wells indicated the presence of sheen in wells W-1 and W-2 in the former UST pit. Soil removed from the former UST pit excavation was disposed at a Class

I Landfill; or aerated in accordance with Regulation 8, Rule 40 of the Bay Area Air Quality Management District (BAAQMD) until acceptable TPHg concentrations were detected by laboratory analysis, and then disposed at a local landfill by ARCO's contractor.

AGS prepared a work plan for a supplemental environmental investigation to evaluate the extent of gasoline hydrocarbon impact at the site (AGS, September 11, 1988). The proposed work included drilling three soil borings and installing groundwater monitoring wells in each boring. One monitoring well required an encroachment permit, which delayed drilling until July 1989.

In December 1988, AGS collected a groundwater sample from well W-4 and analyzed for TPHg and the volatile gasoline constituents benzene, toluene, ethylbenzene, and total xylenes (BTEX) (AGS, January 5, 1989). No detectable concentrations of TPHg and BTEX were reported (Table 2).

In July 1989, AGS drilled four soil borings (B-1/MW-1 through B-4/MW-4) and installed four groundwater monitoring wells in the borings to further delineate the extent of gasoline-impacted soil and groundwater (AGS, March 27, 1991). Monitoring wells MW-1, MW-2, and MW-4 were drilled onsite, while well MW-3 was drilled offsite on the west side of Irwin Court. The locations of the wells are shown on Plate 2. Concentrations of TPHg in the soils from the borings ranged from nondetectable to 60 ppm. The soil sample results are summarized in Table 1. Soils encountered in the borings consisted primarily of silty clay with some sand and gravel. A sandy gravel lens was found in boring B-4/MW-4 at depths of 13 to 22 feet below the ground surface, and was underlain by silty clay.

In May 1992, RESNA performed a well survey, which identified environmental problem sites and activities within a 1-mile radius of ARCO Station 374 to identify potential offsite secondary sources of petroleum hydrocarbons. On site that was identified is a former Mobile Oil Service Station, located at 6398 Telegraph Avenue, which is known to have a leaking UST according to Report on Releases of Hazardous Substances from Underground Storage Tanks (State Water Resources Control Board, January 1992). This site, now a vacant lot, is currently owned by Givens Investment Company. The leak was reported in April 1986 and was last reviewed (according to the Report) in June 1990. No action has

been taken by the responsible party since the initial report of the leak, although recommendations in the Report included removal of free product and excavation and treatment of contaminated soil.

Pump Test

On April 11, 1991, RESNA performed a step-drawdown test on well W-2 to determine the optimum pumping rate at which to perform the constant discharge test. It was decided to pump at the maximum capacity of the pump/discharge system as a way of de-watering the gravel backfill. On April 25 and 26, 1991, a 10.5-hour pump test and 20-hour recovery test was conducted (RESNA, July 31, 1991). Well W-2 was pumped at a rate of 9.0 gallons per minute (gpm). The hydraulic conductivity of the gravel backfill was calculated to be 2,780 feet per day (ft/d). The rate of inflow from the aquifer to the tank backfill was approximately 0.29 gpm, and thus the aquifer was estimated to be several orders of magnitude less permeable than the gravel backfill. An estimate of the hydraulic conductivity of the aquifer using Darcy's Law was approximately 0.37 ft/day.

Groundwater Monitoring

Monitoring of groundwater monitoring wells MW-1 through MW-4 has been conducted since July 1989. Laboratory analytical results of groundwater samples indicated that the groundwater beneath the site contained elevated levels of gasoline hydrocarbons. Concentrations of TPHg in August, 1990 ranged from nondetectable in MW-1 to 69,000 parts per billion (ppb) in MW-4. Some sheen and emulsion has been observed in wells MW-2, MW-3, and MW-4. Laboratory analytical results for groundwater samples collected since July 1989 are summarized in Tables 2 and 3. In March 1992, TPHg concentrations ranged from nondetectable in MW-1 to 1,200 ppb in MW-3. Benzene exceeded the Maximum Contaminant Level (MCL) in wells MW-2, MW-3, and MW-4, while toluene exceeded the Drinking Water Action level (DWAL) in MW-3. Based on the groundwater elevations measured between August 1990 and March 1992, the local groundwater flow direction is toward the south/southwest.

In October 1990, a groundwater sample from well MW-1 was submitted for a general mineral analysis. Laboratory results indicated that the native water is of relatively low quality, with mineral concentrations of chloride, manganese, and total dissolved solids exceeding the MCLs established for secondary drinking water supplies established by Title 40 of the Code of Federal Regulations, Section 143 and Title 22, Section 64445.1 of the California Administrative Code. Mineral analysis results for groundwater samples are shown in Table 4, Results of General Mineral Analysis in Groundwater.

LIMITED OFFSITE RECORDS SEARCH

Data containing a compilation of Federal and California State agencies environmental data which identifies environmental problem sites and activities within a one mile radius of ARCO Station 374 was obtained from Vista Environmental Information, Inc. (Vista) of San Diego, California (Vista, May 14, 1992). This data was collected to identify potential secondary sources for hydrocarbons detected in the soil and groundwater at the site. The data listed information on the following database listings: the National Priorities List (NPL) for January 1992; the United States Environmental Protection Agency's (US EPA) Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) list for January 1992; the State of California's Environmental Protection Agency's (Cal EPA) Annual Work Plan (AWP) list for October 1991; the RWQCB's Leaking Underground Storage Tanks (LUST) list for various dates; the California Waste Management Board's Solid Waste Information System (SWIS) list for July 1991; and the Cal EPA's Abandoned Sites Program (CASITES) list for October 1991. These sources revealed that three sites on the LUST list are within a maximum of 1/4-mile of the site; eight sites on the LUST list and 10 sites on the CASITES list are within 1/4- to 1/2-mile of the site; and 24 sites on the LUST list, 23 sites on the CASITES list, and one site on the CERCLIS list are within 1/2- to one mile of the site. A copy of VISTA's Radius Status Report is included in Appendix A, Offsite Environmental Information Listing. The locations of these sites are shown on Plate A1 of Appendix A.

Of the total of 69 listed sites, only one site appears to be a possible secondary source (within 1/4-mile) and in an upgradient/crossgradient direction of ARCO Station 374. This secondary source has been identified as a former service station facility with detected UST

leaks. This upgradient/crossgradient site is located at 6398 Telegraph Avenue and is owned by the Givens Investment Company (Givens) of Berkeley, California. At present, the 6398 Telegraph Avenue site is a vacant lot located to the southeast of the ARCO Station diagonally across Telegraph Avenue.

According to information on the Alameda County Assessor's roll (Alameda County, November 20, 1991), the present owners of the 6398 Telegraph Avenue property are R. J. and Ellen C. Zweben, Shel Givens, and Diane Wagner. In November 1991, a RESNA geologist performed a preliminary Title Records review of information on the 6398 Telegraph Avenue property. The records reviewed indicated that Zweben, et al. acquired the property in June 1985 from the Mobil Oil Corporation (Mobile Oil). Mobil Oil had been the owner of the property between October 1972 and June 1985. Between October 1963 and October 1972, American Oil Company had been the owner of the property. Aerial photographs obtained from Pacific Aerial Surveys of Oakland, California, confirm that a gasoline station was built at the southeastern corner of the intersection of Telegraph and Alcatraz Avenues (6398 Telegraph Avenue, Oakland, California) and existed from at least 1957 until at least 1985 (Pacific Aerial Surveys, 1957, 1969, 1975, and 1985).

A preliminary records search was conducted at the Regional Water Quality Control Board (RWQCB) regarding the 6398 Telegraph Avenue property located across from the site in the upgradient/crossgradient groundwater flow direction (RESNA, March 1991). The RWQCB records indicated that a report had been prepared by AquaScience Engineers describing the removal of three gasoline USTs and one waste-oil UST which had been removed from that site (AquaScience Engineers, 1986). The waste-oil tank and one gasoline UST were reported to have holes in them. It was also reported that each tank pit had been found to contain water with floating product residue. Contaminated water was reportedly removed and contaminated soil was excavated and aerated. No record that a subsurface environmental investigation has been conducted to assess the possible impact on groundwater downgradient or crossgradient from that site has been located.

FIELD WORK

Drilling

Well Construction Permit No. 92140 was acquired from the Alameda County Flood Control and Water Conservation District (ACFCWCD), and encroachment permits were acquired from the City of Oakland prior to drilling at the site. Copies of the permits are included in Appendix B, Permits. On April 1, 1992, a RESNA geologist was at the site to observe the drilling of two offsite soil borings (B-5 and B-6). Field work at the site was conducted in accordance with the field protocol and the Site Safety Plan (RESNA, March 30, 1992). A summary of the field methods employed by RESNA is included in Appendix C, Field Methods.

Borings B-5 and B-6 were drilled to depths just below the first-encountered water-bearing zone (approximately 25-1/2 and 17 feet, respectively) and groundwater monitoring wells (MW-5 and MW-6, respectively) were installed in the borings, to evaluate the lateral extent of gasoline hydrocarbons in groundwater offsite in the downgradient and crossgradient directions. Based on previous depth to groundwater measurements in MW-1 through MW-4, the local groundwater gradient was determined to be generally to the southwest (RESNA, March 5, 1992). Soil boring B-5/MW-5 was drilled southwest of the site on the south side of Alcatraz Avenue. Soil boring B-6/MW-6 was drilled west of the site on the west side of Irwin Court. The locations of the borings/wells are shown on Plate 2.

Soil Sampling and Description

A total of eight soil samples were collected from the soil borings during drilling and described by RESNA's field geologist using the Unified Soil Classification System, Plate 3. Soil descriptions and other pertinent observations made during drilling were recorded on the Logs of Borings, Plates 4 through 6. Soil samples from borings B-5 and B-6 were collected at a maximum of 5-foot intervals from the ground surface to the total depths of the borings at 25½ and 17 feet, respectively. Soil sampling procedures are described in Appendix C. Field measurements of organic vapors were monitored with an organic vapor

meter (OVM) which provides an order of magnitude field analysis of organic vapor content from selected soil samples. The OVM did not detect any organic vapors during the drilling operations.

The earth materials encountered beneath the street areas southwest of the site consist primarily of fine-grained materials. Beneath the asphalt and baserock cover materials, fine-grained materials consisting of silty to gravelly clay were encountered between the depths of approximately 1-½ and 19-½ feet; however, a layer of coarse-grained materials consisting of dense sandy gravel was encountered in boring B-6 between the depths of approximately 8 and 15 feet. Beneath the silty to gravelly clay in boring B-5, a thin layer of clayey sand was encountered between the depths of approximately 19-½ and 20 feet. Beneath the clayey sand, fine-grained materials consisting of silty clay to sandy silt were encountered between the depths of approximately 20 feet and the bottom of boring B-5 at approximately 25-½ feet. Groundwater was first encountered in borings B-5 and B-6 at depths of approximately 19 and 8 feet, respectively, below the ground surface. The site stratigraphy is shown graphically in the Geologic Cross Sections A-A', B-B', and C-C' (Plates 7, 8, and 9). The locations of the geologic sections are shown on Plate 2.

Monitoring Well Construction and Development

Two groundwater monitoring wells (MW-5 and MW-6) were constructed in borings B-5 and B-6, respectively. Groundwater monitoring wells MW-5 and MW-6 were completed with 4-inch-diameter, Schedule 40, polyvinyl chloride (PVC) casing. Well casings were set in borings B-5 and B-6 to depths of approximately 23 and 15 feet below ground surface, respectively. The screened casings for monitoring wells MW-5 and MW-6 consist of 4-inch-diameter, 0.020 inch-wide machine-slotted PVC set from the total depth of the well to approximately 10 and 5 feet below the ground surface, respectively. Blank PVC casing was set from the top of the screened casing to within a few inches below the ground surface.

The monitoring wells were developed on April 9, 1992 using a surge block, and by bailing and pumping to remove fine-grained sediments and to allow better communication between the water-bearing zone and the groundwater monitoring well. Details regarding well construction and development are described in Appendix C.

Groundwater Level Measurements and Sampling

On April 9, 1992, depths-to-water (DTW) were measured and groundwater samples were collected for subjective visual inspection of floating product after development in groundwater monitoring wells MW-5 and MW-6. On April 15, 1992, prior to purging and sampling wells MW-1 through MW-6, Emcon personnel measured DTW and collected groundwater samples for subjective analysis. No visual evidence of hydrocarbon product was noted in the subjective samples from wells MW-1 through MW-6. An obvious petroleum odor was noted in the groundwater samples collected for subjective analysis from monitoring wells MW-3 and MW-4. Wells MW-1 through MW-6 were purged and sampled on April 15, 1992. Samples were submitted to a State-certified Hazardous Materials Testing Laboratory in accordance with Chain of Custody protocol. The cumulative measured DTW and the calculated groundwater elevations are summarized in Table 5, Cumulative Groundwater Monitoring Data. Appendix C contains a description of subjective analysis and groundwater sampling procedures.

LABORATORY ANALYTICAL METHODS

Soil Samples

The selected soil samples were preserved as required by the applicable analytical method, as proposed in Addendum One to the Work Plan, and delivered with Chain of Custody Records to Sequoia Analytical Laboratories of Redwood City, California, (State of California Hazardous Waste Testing Laboratory Certification No. 1210) for analysis.

Three soil samples collected from borings B-5 and B-6 were analyzed in accordance with ACHCSA requirements for the gasoline constituents BTEX and TPHg using modified Environmental Protection Agency (EPA) Methods 5030/8015/8020. The soil samples were selected for laboratory analysis based on:

- Location above first-encountered groundwater;
- Location in a potential confining or perching layer below first-encountered groundwater;

- Areas where the presence of gasoline hydrocarbons was suspected;
- At 5-foot intervals and/or change in stratigraphic units, as recommended by California Department of Health Services (DHS) guidelines.

Groundwater Samples

Groundwater samples collected from wells MW-1 through MW-6 by Emcon were preserved as required by the applicable analytical method, as proposed in Addendum One to the Work Plan, and delivered with Chain of Custody Records to Columbia Analytical Services' laboratory in San Jose, California, (State of California Hazardous Waste Testing Laboratory Certification No. 1426) for BTEX and TPHg by modified EPA Methods 5030/8015/602.

RESULTS OF LABORATORY ANALYSES

Soil

The results of laboratory analysis of the three soil samples from borings B-5 and B-6 indicated nondetectable concentrations of TPHg (less than 1.0 ppm) and BTEX (less than 0.005 ppm). The results of laboratory analysis of these soil samples are included in Table 1, and interpreted lines of equal concentration of TPHg in soil are shown on the Geologic Cross Sections A-A', B-B', and C-C' (Plates 7, 8, and 9). Chain of Custody Records and copies of laboratory analysis reports for soil samples are included in Appendix D.

Groundwater

The results of laboratory analysis of the groundwater samples collected from offsite wells MW-5 and MW-6 indicated nondetectable TPHg (less than 50 ppb) and BTEX (less than 0.5 ppb). Concentrations of TPHg in the onsite wells ranged from nondetectable in upgradient well MW-1 to 8,500 ppb in downgradient well MW-4. A concentration of 1,600 ppb of TPHg was detected in the remaining offsite and downgradient well MW-3. Concentrations of BTEX in wells MW-1 through MW-4 ranged from nondetectable (less than 0.5 ppb) in well MW-1 to 2,100 ppb in well MW-4. The concentrations of benzene exceeded the State of California Maximum Contaminant Level (MCL) in wells MW-2, MW-

3, and MW-4. The concentrations of toluene exceeded the State of California Drinking Water Action Level (DWAL) in wells MW-3 and MW-4. The results of these analyses are summarized in Table 2, Cumulative Results of Laboratory Analyses of Groundwater Samples for TPHg, TPHd, BTEX, and TOG. Interpreted lines of equal concentration of TPHg and benzene in the groundwater on the date of sampling are shown on TPHg Concentrations in Groundwater and Benzene Concentrations in Groundwater (Plates 10 and 11, respectively). Chain-of-Custody records and laboratory analysis reports are included in Appendix D. Additional data on the second quarter 1992 groundwater monitoring will be reported in the quarterly monitoring report at a later date.

EVALUATION OF GROUNDWATER GRADIENT

On April 27, 1992, the wellheads for groundwater monitoring wells MW-1 through MW-6, W-1, and W-2 were surveyed to a local National Geodetic Vertical Datum benchmark by John E. Koch, a licensed surveyor in Oakland, California. The results of this wellhead survey are included in Appendix E, Well Survey Report. The new wellhead elevations for wells MW-1 through MW-4 are different from the wellhead elevations calculated by Ron Archer, Civil Engineer (Archer) of Pleasanton, California, on July 28, 1989. This is due to the fact that Archer reported the benchmark destroyed at the intersection of Alcatraz Avenue and Racine Street, and an estimated elevation was taken for the 1989 survey (Archer, 1989). On April 15, 1992, Emcon measured the DTW in wells MW-1 through MW-6. Groundwater elevations for each well were calculated by subtracting the measured depth-to-water from the surveyed elevation of the top of the casing. The DTW measurements, wellhead elevations, and groundwater elevations are presented in Table 3, Cumulative Groundwater Monitoring Data.

Based on groundwater elevations calculated from these DTW measurements the inferred local groundwater gradient is approximately 0.04 to the west-southwest. A graphical interpretation of the groundwater gradient is presented on Plate 12, Groundwater Gradient Map.

CONCLUSIONS

Based on the results of this and previous environmental investigations, RESNA concludes the following:

- **Abandoned Upgradient/Crossgradient Service Station**

  Data containing a compilation of Federal and California State Agency environmental data which identifies environmental problem sites and activities within a 1-mile radius of ARCO Station 374 was reviewed to identify potential offsite secondary sources for hydrocarbons detected in the soil and groundwater at the site. One site which is a potential secondary source is a former Mobil Oil Service Station site, located diagonally across Telegraph Avenue, approximate 120 feet southeast and upgradient/crossgradient of ARCO 374. The street address for this site is 6398 Telegraph Avenue.

  This potential secondary source is currently a vacant lot owned by Givens Investment Company (Givens). The site is known to have had an underground-storage tank (UST) leak, as evidenced by placement of the site on the Report on Releases of Hazardous Substances from Underground Storage Tanks, State Water Resources Control Board, California Environmental Protection Agency January 1992, Report No. 92-2CWP and by the tank removal report, which reported that holes were noted in the waste-oil tank and one of the 5,000-gallon tanks; floating product was also noted in the tank pit (AquaScience Engineers, May 27, 1986). The service station was present at this location from at least 1957 until at least 1985. According to the Report on Releases of Hazardous Substances from Underground Storage Tanks, the leak was reported in April 1986 and was last reviewed in June 1990 and no action has been taken by the responsible party since the initial report of the leak. Actions recommended in the report regarding the former Mobile Station include removal of free product and excavation and treatment of contaminated soil. There is no known record of any agency letter requiring further work on the site.

- **Hydrocarbons in Soil**

  Gasoline hydrocarbons in soil have been evaluated laterally at the site to TPHg concentrations below 100 ppm to the north, east, and west of the former gasoline USTs, as evidenced by laboratory results from soil samples collected from borings B-1, B-2, and B-4, respectively.

- **Hydrocarbons in Shallow Groundwater**

  Gasoline hydrocarbons have impacted groundwater at the site, based on reported TPHg concentrations of up to 69,000 ppb in water samples collected from onsite monitoring wells MW-1, MW-2, MW-3, and MW-4.

  Gasoline hydrocarbons have been evaluated to nondetectable TPHg (<50 ppb) and BTEX (<0.5 ppb) in the relatively upgradient direction (northeast), in a portion of the downgradient direction (south-southwest), and in the crossgradient direction (northwest) from the former gasoline USTs, as indicated by the laboratory results for water sample collected in April 1992 from wells MW-1, MW-5, and MW-6, as shown on Plate 10 (TPHg Concentrations in Groundwater) and Plate 11 (Benzene Concentrations in Groundwater).

  The extent of gasoline hydrocarbons in groundwater has been delineated directly downgradient (west-southwest) from the former gasoline USTs.

- **Groundwater Gradient**

  The groundwater gradient is approximately 0.04 to the west-southwest. This groundwater flow direction is similar to the topographically-inferred local groundwater gradient flow direction.

REPORT DISTRIBUTION

RESNA recommends that copies of this report be sent to the following agencies:

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LIMITATIONS

This report was prepared in accordance with generally accepted standards of environmental geological practice in California at the time this investigation was performed. This investigation was conducted solely for the purpose of evaluating environmental conditions of the soil and groundwater with respect to gasoline-related hydrocarbons at the site. No soil engineering or geotechnical references are implied or should be inferred. Evaluation of the geologic conditions at the site for the purpose of this assessment is made from a limited number of observation points. Subsurface conditions may vary away from the data points available. Additional work, including further subsurface investigation, can reduce the inherent uncertainties associated with this type of assessment.

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RESNA. November 21, 1991. Letter Report, Quarterly Groundwater Monitoring Third Quarter 1991 at ARCO Station 374, 6407 Telegraph Avenue, Oakland, California. 60025.02.

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(Continued)

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RESNA. March 30, 1992. Site Safety Plan for a Subsurface Environmental Investigation near the ARCO Service Station No. 374, 6407 Telegraph Avenue, Oakland, California. 60025.05S.

Ron Archer, Civil Engineer, Inc. July 28, 1989. Wellhead Survey at ARCO Station 374, Oakland, California.

Base: U.S. Geological Survey
7.5-Minute Quadrangles
Oakland West/East, California
Photorevised 1980

LEGEND

⊙ = Site Location

N

Approximate Scale

2000 1000 0 2000 4000

feet

RESNA	**SITE VICINITY MAP** **ARCO Station 374** **6407 Telegraph Avenue** **Oakland, California**	**PLATE** **1**
PROJECT 60025.05		

EXPLANATION

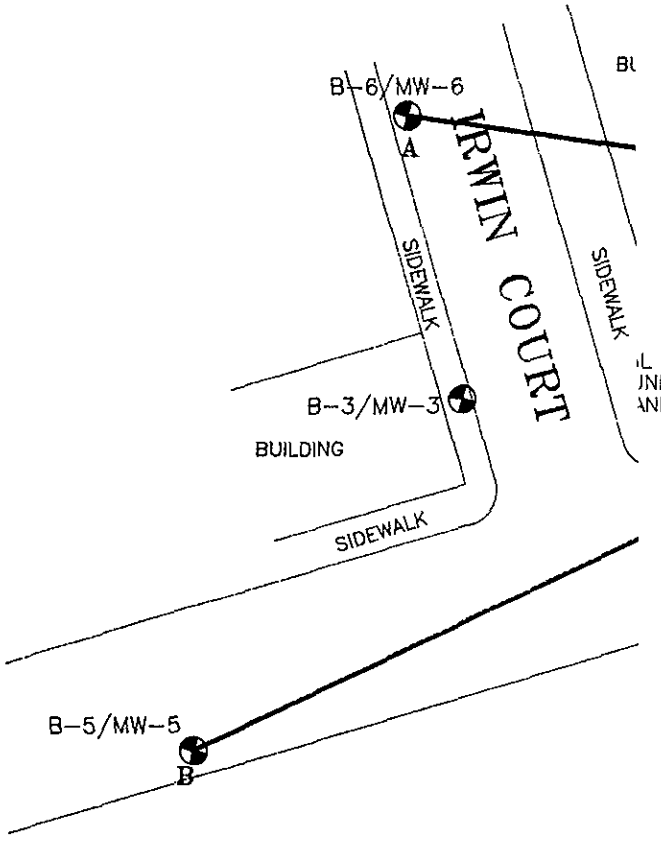
B–6/MW–6 = Monitoring well (Applied GeoSystems, 1989)

W–4 = Tank pit monitoring well (Applied GeoSystems, 1988)

B–4 = Soil boring (Applied GeoSystems, 1988)

* = Boring drilled and sampled prior to tank replacement

C ——— C' = Geologic cross–sections



N

Approximate Scale

40 20 0 40 80

feet

Source: Surveyed by Ron Archer, Civil Engineer, Inc.

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PROJECT 60025.0

PLATE 2

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.	HIGHLY ORGANIC SOILS		PT	Peat and other highly Organic Soils.
		SC	Clayey Sands, Sand-Clay mixtures.				


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.

RESNA

PROJECT 60025.05

UNIFIED SOIL CLASSIFICATION SYSTEM AND SYMBOL KEY

ARCO Station 374
6407 Telegraph Avenue
Oakland, California

PLATE 3

Depth of boring: 25-1/2 feet Diameter of boring: 10 inches Date drilled: 4/1/92

Well depth: 23 feet Material type: Sch 40 PVC Casing diameter: 4 inches

Screen interval: 10 to 23 feet Slot size: 0.020-inch

Drilling Company: Gregg Drilling Driller: Steve Stone

Method Used: Hollow-Stem Auger Field Geologist: Rob Campbell

Signature of Registered Professional:

Registration No.: RCE 044600 State: CA

Depth	Sample No.	Blows	P.I.D.	USCS Code	Description	Well Const.
					Paved street: Alcatraz Avenue	
0					Asphalt (6 inches).	
				SW	Gravelly sand, gray, damp, very dense: Fill (Baserock).	
2				CL	Silty clay with trace of coarse-grained sand, dark blue-gray, damp, medium plasticity, very stiff.	
4					Color change to light brown at 4 feet.	
6	S-5.5	7 18 22	0		Color change to light brown mottled with green, hard; caliche nodules present.	
8					Color change to green at 7-1/2 feet. (Water level - 4/9/92).	
10	S-10	5 10 20	0		Color change to dark green at 10 feet, moist.	
12						
					Color change to light brown at 13 feet.	
14	S-14.5	6 14 29	0	CL	Sandy clay with silt, light brown, very moist, medium plasticity, hard.	
16				CL	Gravelly clay with sand, light brown, very moist, low plasticity, hard.	
18				CL	Silty clay with sand, light brown, very moist, low plasticity, very stiff.	
20	S-19	8 10 12	0	SC	Clayey sand, brown, wet, medium dense.	
				CH	Silty clay, light brown, very moist, high plasticity, hard.	

(Section continues downward)

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PROJECT: 60025.05

LOG OF BORING B-5/MW-5

ARCO Station 374
6407 Telegraph Avenue
Oakland, California

PLATE 4

Depth	Sample No.	BLOWS	P.I.D.	USCS Code	Description	Well Const.
22				CH	Silty clay, light brown, very moist, high plasticity, hard.	
24	S-24.5	10 22 35	0	ML	Sandy silt with clay, brown, moist, low plasticity, hard.	
26					Total depth = 25-1/2 feet.	
28						
30						
32						
34						
36						
38						
40						
42						
44						
46						
48						
50						

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PROJECT 60025.05

LOG OF BORING B-5/MW-5
ARCO Station 374
6407 Telegraph Avenue
Oakland, California

PLATE
5

Depth of boring: 17 feet Diameter of boring: 10 inches Date drilled: 4/1/92

Well depth: 15 feet Material type: Sch 40 PVC Casing diameter: 4 inches

Screen interval: 5 to 15 feet Slot size: 0.020-inch

Drilling Company: Gregg Drilling Driller: Steve Stone

Method Used: Hollow-Stem Auger Field Geologist: Rob Campbell

Signature of Registered Professional:

Registration No.: RCE 044600 State: CA

Depth	Sample No.	Blows	P.I.D.	USCS Code	Description	Well Const.
					Paved Street: Irwin Court.	
0					Asphalt (7 inches).	
				SW	Gravelly sand, gray, damp, very dense: Fill (baserock).	
2				CL	Silty clay, dark brown mottled with green, moist, medium plasticity, stiff.	
4					Color change to light brown at 3-1/2 feet. (Water level - 4/9/92)	
	S-5.5	4 6 9	0	CL	Sandy clay with silt, light brown, moist, low plasticity, stiff; some organic fragments and root holes.	
6						
8						
		11		GP	Sandy gravel with some silt, light brown, wet, dense.	
10	S-10	18 25	0			
		4 8				
12		16	0			
		6				
14		12				
	S-15	18	0			
		11		CL	Silty clay with gravel, light brown, very moist, medium plasticity, hard.	
16		25				
		32	0			
					Total depth = 17 feet.	
18						
20						

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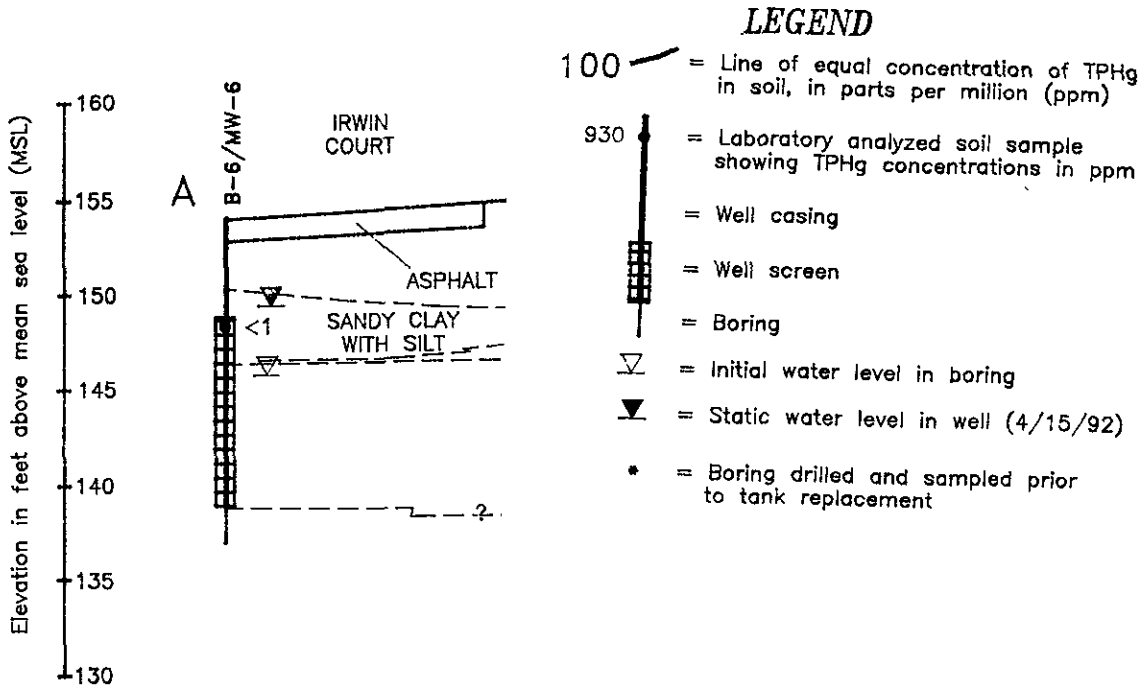
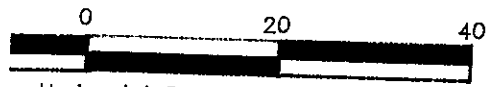
PROJECT: 60025.05

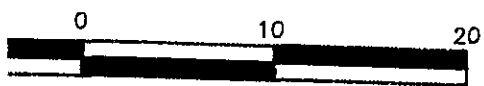
LOG OF BORING B-6/MW-6

ARCO Station 374
6407 Telegrapf Avenue
Oakland, California

PLATE 6







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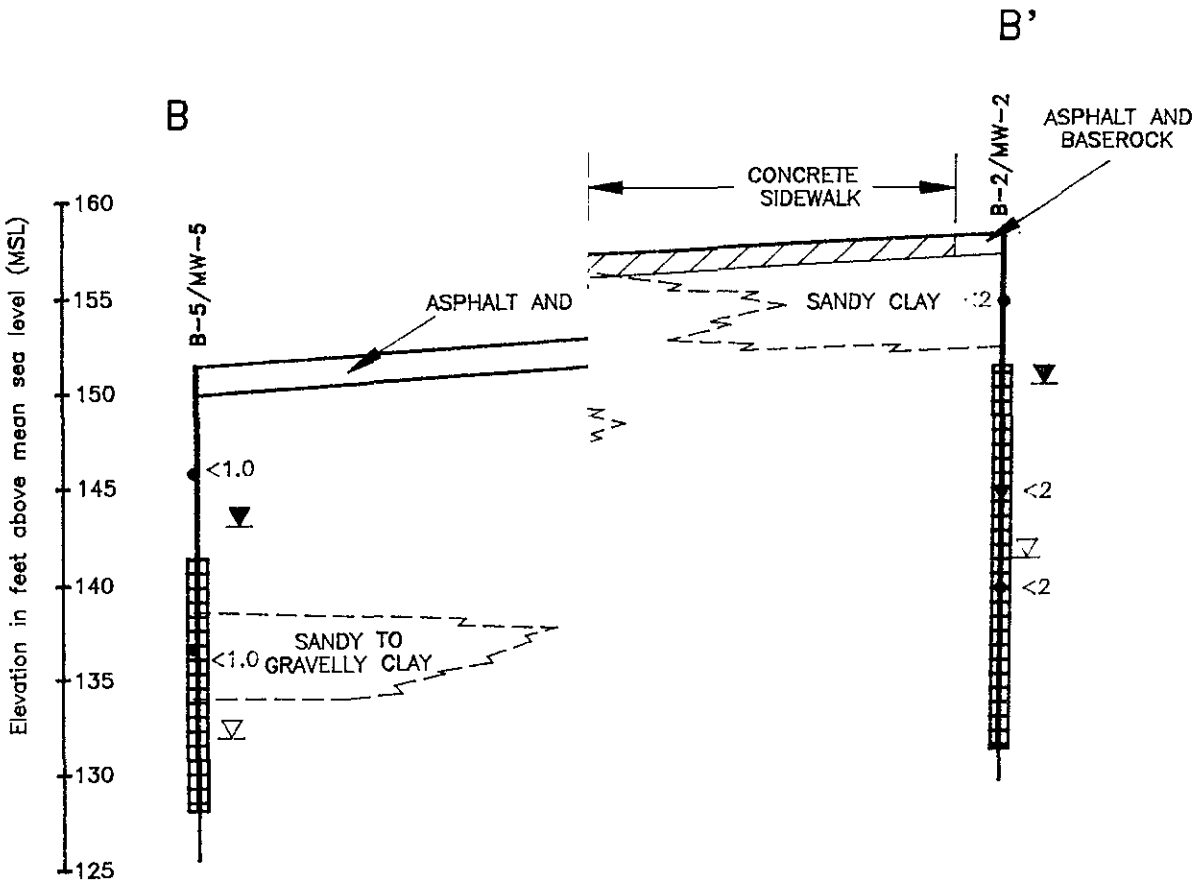
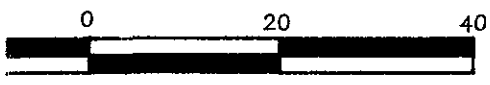
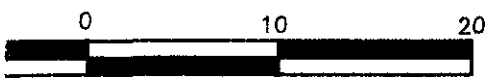
PROJECT: 60025.05

PLATE
7







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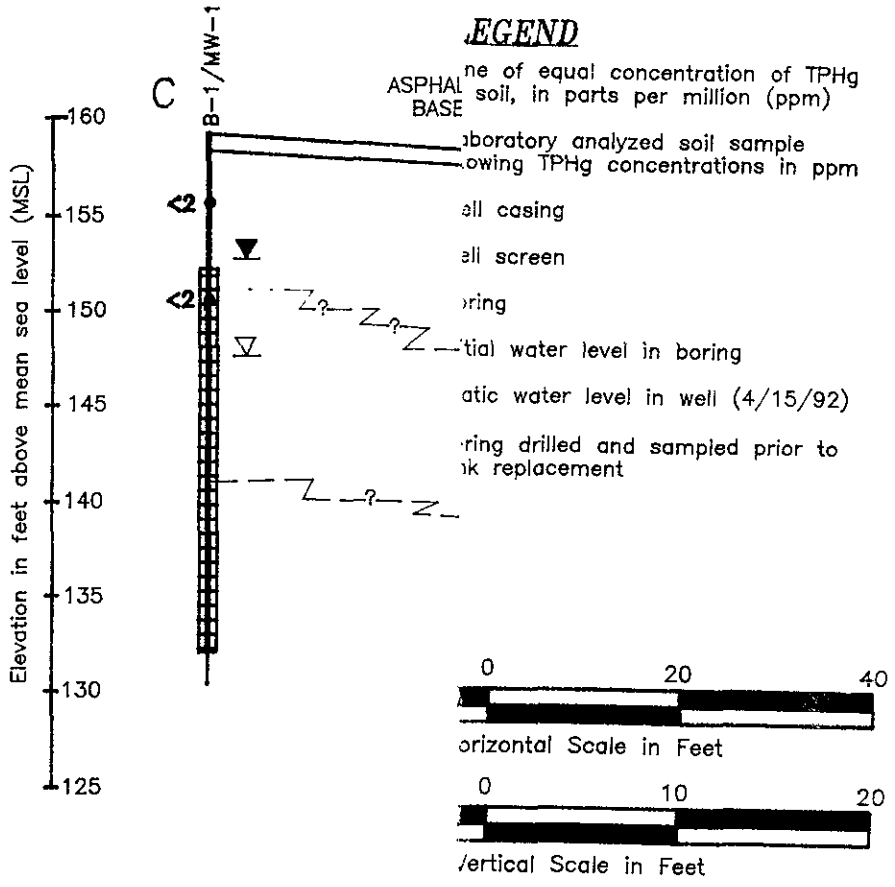
PROJECT: 60025.05

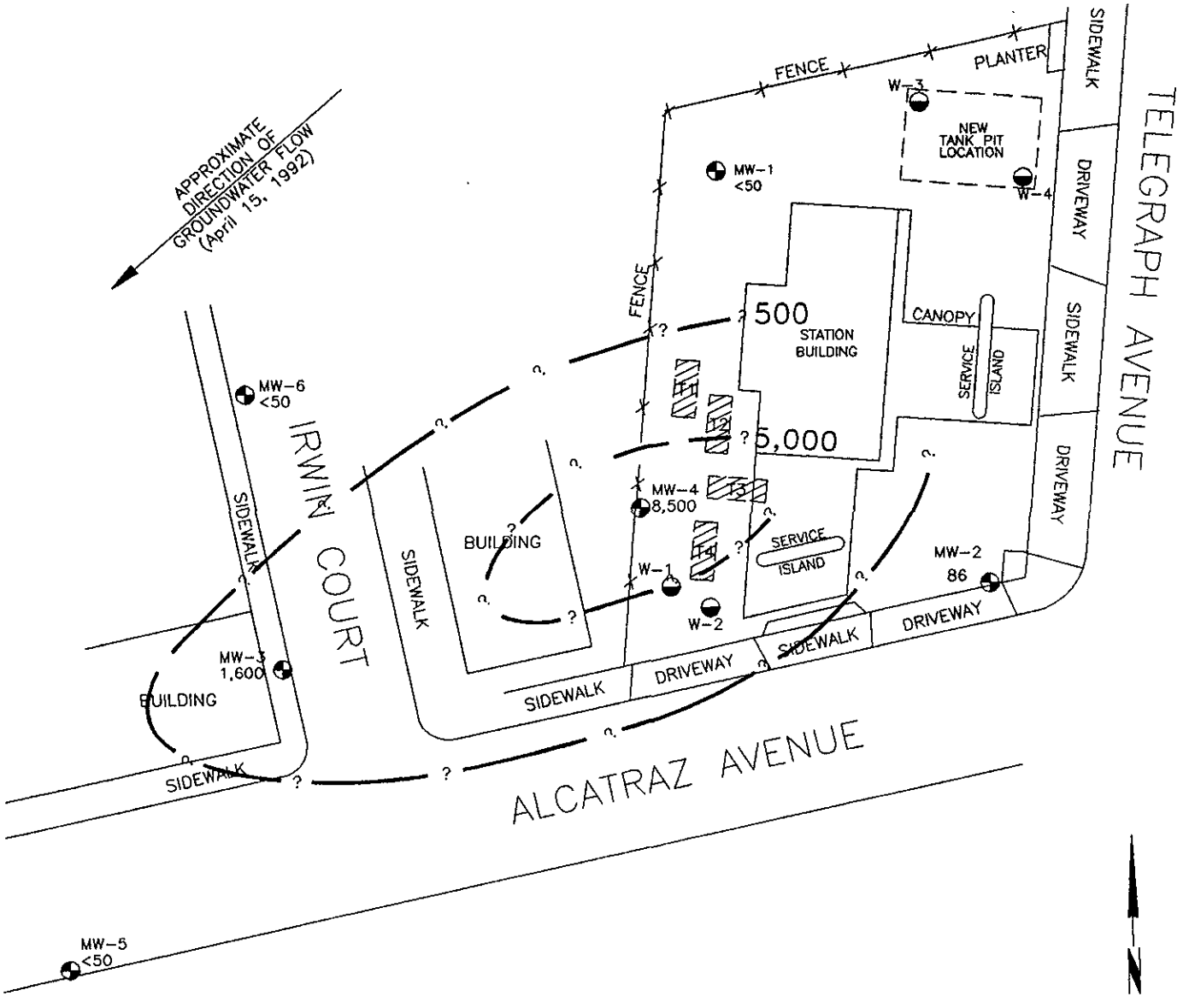
PLATE
8



RESNA
Working to Restore Nature

PROJECT: 60025.05

PLATE 9



EXPLANATION

5,000 = Line of equal concentration of TPHg in groundwater, in parts per billion (ppb)

8,500 = Concentration of TPHg in groundwater, in ppb, April 15, 1992

MW-6 = Monitoring well (RESNA, July 1989, and April 1992)

W-4 = Tank pit monitoring well (RESNA, 1988)

= Former underground storage tanks

Approximate Scale

40 20 0 40 80

feet

Source: Surveyed by John Koch, Licensed Land Surveyor.

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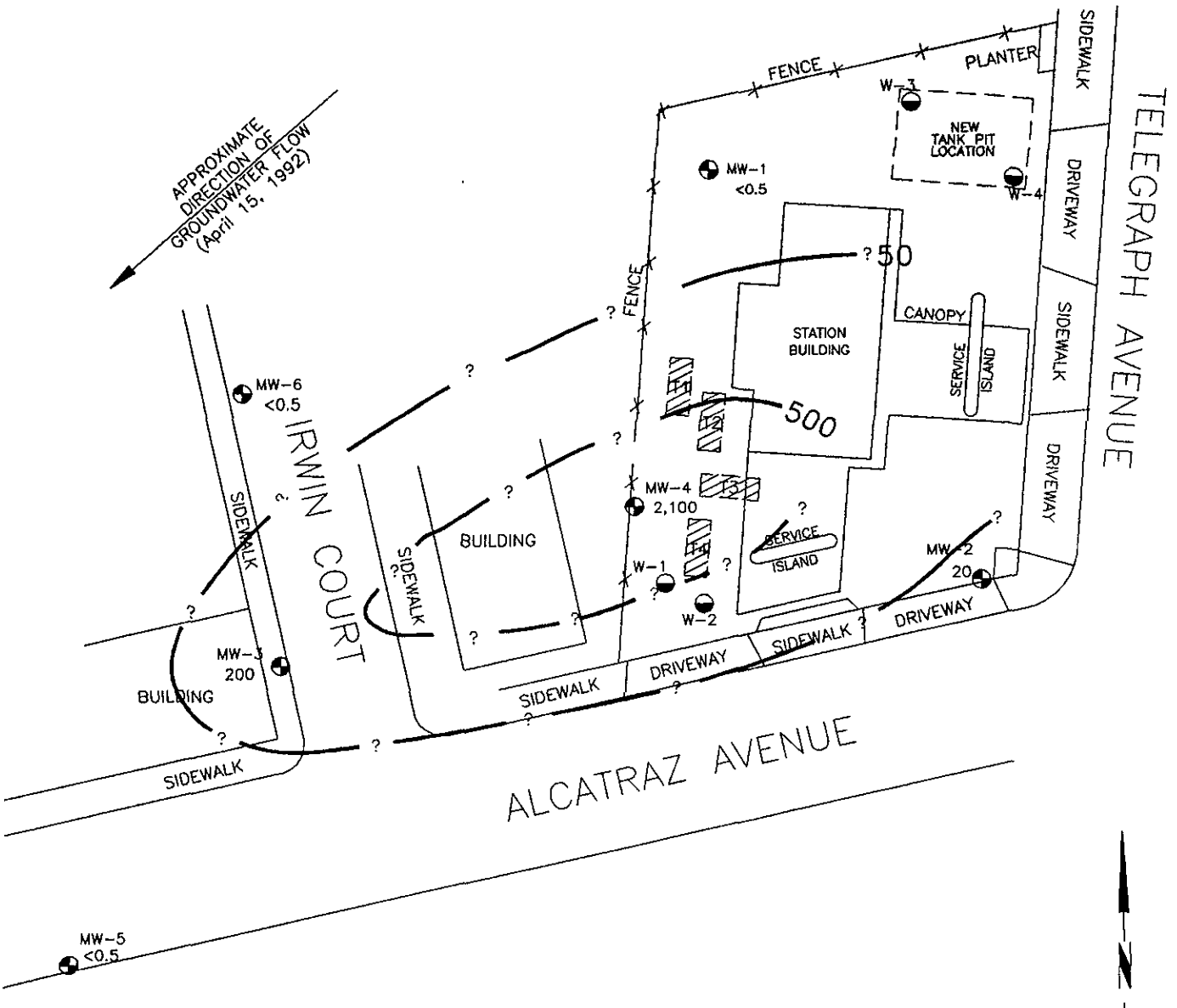
PROJECT 60025.05

TPHg CONCENTRATIONS IN GROUNDWATER
ARCO Station 374
6407 Telegraph Avenue
Oakland, California

PLATE 10



EXPLANATION

500 = Line of equal concentration of benzene in groundwater, in parts per billion (ppb)

2,100 = Concentration of benzene in groundwater, in ppb, April 15, 1992

MW-6 = Monitoring well (RESNA, July 1989, and April 1992)

W-4 = Tank pit monitoring well (RESNA, 1988)

= Former underground storage tanks

Approximate Scale

40 20 0 40 80

feet

Source: Surveyed by John Koch, Licensed Land Surveyor.

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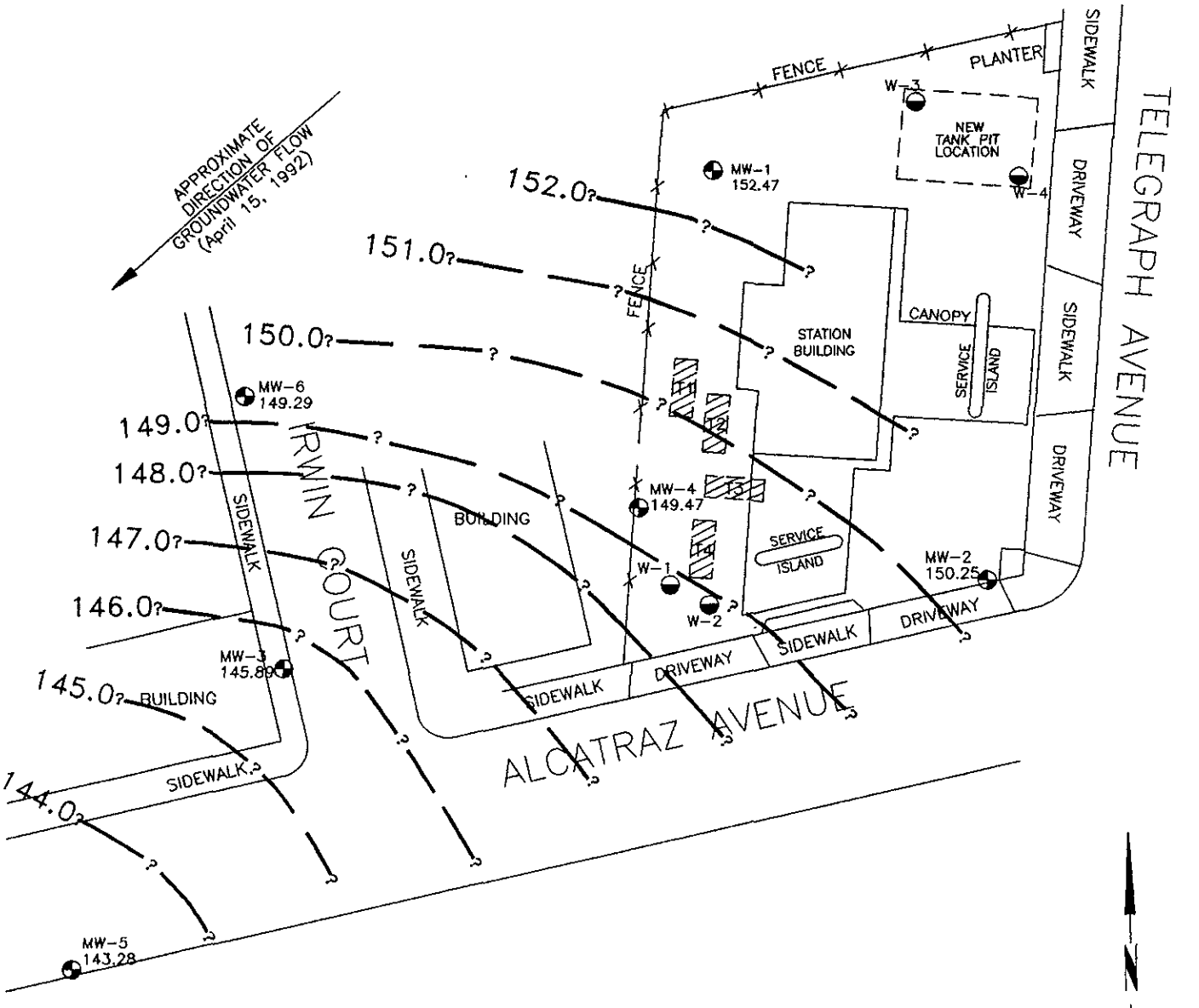
BENZENE CONCENTRATIONS IN GROUNDWATER
ARCO Station 374
6407 Telegraph Avenue
Oakland, California

PLATE 11



EXPLANATION

152.0 = Line of equal elevation of groundwater in feet above mean sea level (MSL)

152.47 = Elevation of groundwater in feet above MSL April 15, 1992

MW-6 = Monitoring well (*RESNA, July 1989, and April 1992*)

W-4 = Tank pit monitoring well (RESNA, 1988)

= Former underground storage tanks

Approximate Scale

40 20 0 40 80

feet

Source: Surveyed by John Koch, Licensed Land Surveyor.

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PROJECT 60025.05

GROUNDWATER GRADIENT MAP
ARCO Station 374
6407 Telegraph Avenue
Oakland, California

PLATE 12

TABLE 1
CUMULATIVE RESULTS OF LABORATORY ANALYSES
OF SOIL SAMPLES
ARCO Station 374
6407 Telegraph Avenue
Oakland, California
(Page 1 of 2)

Sample Number	TPHg	Benzene	Toluene	Ethyl-benzene	Total Xylenes
April 1988 - Limited Environmental Site Assessment					
S-05-B1	165	NA	NA	NA	NA
S-10-B1	48	NA	NA	NA	NA
S-05-B2	260	NA	NA	NA	NA
S-8.5-B2	60	NA	NA	NA	NA
S-05-B3	64	NA	NA	NA	NA
S-09-B3	62	NA	NA	NA	NA
S-05-B4	389	NA	NA	NA	NA
S-8.5-B4	930	NA	NA	NA	NA
June 1988 - Excavation and Removal of USTs					
S-11-T1A	399	14.7	20.0	20.5	91.9
S-11-T1B	8	2.57	0.74	0.39	2.75
S-12-T2A	4	0.35	0.10	0.38	0.70
S-12-T2B	75	0.91	1.77	3.61	11.92
S-12-T3A	4	2.54	0.13	<0.05	0.13
S-12-T3B	<2	<0.05	<0.05	<0.05	<0.05
S-12-T4A	1,097	16.3	34.5	81.6	188.2
S-12-T4A2**	795	23.1	24.9	67.1	130.9
S-12-T4B	3	0.76	<0.05	<0.05	<0.05
S-13-PIT	3.6	0.738	0.038	0.154	0.566
July 1989 - Limited Subsurface Investigation					
S-3.5-B1/MW-1	<2	<0.05	<0.05	<0.05	<0.05
S-8.5-B1/MW-1	60	0.66	2.9	0.99	5.2
S-3.5-B2/MW-2	<2	<0.05	<0.05	<0.05	<0.05
S-13.5-B2/MW-2	<2	<0.05	<0.05	<0.05	<0.05
S-18.5-B2/MW-2	<2	<0.05	<0.05	<0.05	<0.05
S-3.5-B3/MW-3	<2	<0.05	<0.05	<0.05	<0.05
S-3.5-B4/MW-4	<2	<0.05	<0.05	<0.05	<0.05
S-13.5-B4/MW-4	<2	<0.05	<0.05	<0.05	<0.05
S-18.5-B4/MW-4	<2	<0.05	<0.05	<0.05	<0.05
S-0731-B4 (1a,b,c,d)*	21	<0.05	<0.05	<0.05	0.37
April 1, 1992 - Offsite Investigation					
S-5.5-B5	<1.0	<0.005	<0.005	<0.005	<0.005
S-14.5-B5	<1.0	<0.005	<0.005	<0.005	<0.005
S-5.5-B6	<1.0	<0.005	<0.005	<0.005	<0.005

See notes on Page 2 of 2.

TABLE 1
CUMULATIVE RESULTS OF LABORATORY ANALYSES
OF SOIL SAMPLES
ARCO Station 374
6407 Telegraph Avenue
Oakland, California
(Page 2 of 2)

Results are in parts per million (ppm).
TPHg: Total petroleum hydrocarbons as gasoline.
<: Below the reporting limits of the analytical method.
*: Signifies composite sample following aeration.
**: Resample area near sample T4A following additional excavation.
NA: Not analyzed.

Sample designations:

S-5.5-B6
- S: Soil sample
- 5.5: Sample depth in feet
- B6: Boring number

S-12-T4B
- S: Soil sample
- 12: Sample depth in feet
- T4B: Tank number and location

TABLE 2
CUMULATIVE RESULTS OF LABORATORY ANALYSES OF GROUNDWATER SAMPLES
FOR TPHg, TPHd, BTEX, AND TOG
ARCO Station 374
6407 Telegraph Avenue
Oakland, California
(Page 1 of 2)

Well Date	TPHg	TPHd	Benzene	Toluene	Ethyl-benzene	Total Xylenes	TOG
W-4							
12/21/88	<20	NA	<0.50	<0.50	<0.50	<0.50	NA
MW-1							
07/21/89	33	NA	0.77	1.6	1.5	5.0	NA
08/30/89	<20	NA	<0.50	<0.50	<0.50	<0.50	NA
10/04/89	<20	NA	<0.50	<0.50	<0.50	<0.50	NA
01/10/90	<20	NA	<0.50	<0.50	<0.50	<0.50	NA
08/07/90	<20	NA	<0.50	<0.50	<0.50	<0.50	NA
12/06/90	<50	NA	3.6	2.7	0.60	5.80	NA
02/20/91	<50	NA	<0.50	<0.50	<0.50	<0.50	NA
07/08/91	<30	NA	<0.30	<0.30	<0.30	<0.30	NA
09/25/91	<30	NA	0.57	0.57	0.54	1.7	NA
11/20/91	57	NA	9.2	3.7	0.63	2.5	NA
03/09/92	<50	NA	<0.5	<0.5	<0.5	<0.5	NA
04/15/92	<50	NA	<0.5	<0.5	<0.5	<0.5	NA
MW-2							
07/21/89	4,200	NA	280	210	38	24	NA
08/30/89	4,200	NA	160	260	45	240	NA
10/04/89	4,300	NA	860	300	29	330	NA
01/10/90	8,000	NA	890	710	120	760	NA
08/07/90	6,000	NA	880	76	25	80	NA
12/06/90	1,600	NA	330	69	18	63	NA
02/20/91	1,300	NA	160	46	13	48	NA
07/08/91	310	NA	76	18	7.7	24	NA
09/25/91	83	NA	17	0.69	2.2	4.1	NA
11/20/91	180	NA	46	6.1	3.0	8.7	NA
03/09/92	690	NA	170	25	21	58	NA
04/15/92	86	NA	20	2.3	3.8	8.5	NA
MW-3							
07/21/89	430	NA	9	4.8	<0.50	50	NA
08/30/89	1,200	NA	85	46	8.4	55	NA
10/04/89	7,000	NA	580	900	120	670	NA
01/10/90	940	NA	130	59	21	73	NA
08/07/90	2,300	NA	180	64	59	120	NA
12/06/90	460	350	52	55	14	39	NA
02/20/91	470	<100	36	30	9.3	31	<5,000
07/08/91	2,500	NA	240	470	74	320	NA

See notes on page 2 of 2

TABLE 2
CUMULATIVE RESULTS OF LABORATORY ANALYSES OF GROUNDWATER SAMPLES
FOR TPHg, TPHd, BTEX, AND TOG
ARCO Station 374
6407 Telegraph Avenue
Oakland, California
(Page 2 of 2)

Well / Date	TPHg	TPHd	Benzene	Toluene	Ethyl-benzene	Total Xylenes	TOG
MW-3 (continued)							
09/25/91	1,100	NA	120	110	34	120	NA
11/20/91	1,000	NA	180	140	43	140	NA
03/10/92	1,200	NA	200	110	53	130	NA
04/15/92	1,600	NA	200	13	110	81	NA
MW-4							
07/21/89	8,700	NA	720	360	120	640	NA
08/30/89	7,300	NA	630	220	72	320	NA
10/04/89	21,000	NA	2,300	1,300	280	1,300	NA
01/10/90	4,300	NA	470	250	63	430	NA
08/07/90	69,000	28,000	8,700	4,200	540	4,600	<5,000
12/06/90	Not sampled--product sheen						
02/20/91	5,200	<100	690	200	95	580	<5,000
07/08/91	1,700	NA	280	68	37	170	NA
09/25/91	6,300	NA	2,100	290	210	590	NA
11/20/91	2,700	NA	1,200	200	110	320	NA
03/10/92	690	NA	180	80	18	43	NA
04/15/92	8,500	NA	2,100	750	280	1,000	NA
MW-5							
04/15/92	<50	NA	<0.5	<0.5	<0.5	<0.5	NA
MW-6							
04/15/92	<50	NA	<0.5	<0.5	<0.5	<0.5	NA
MCL:	—	—	1	—	680	1,750	—
DWAL:	—	—	—	100	—	—	—

Results in micrograms per liter (μ/L) = parts per billion (ppb).
TPHg: Total petroleum hydrocarbons as gasoline by EPA method 5030/8015.
TPHd: Total petroleum hydrocarbons as diesel by EPA method 3510/8015.
BTEX: B: Benzene, T: Toluene, E: Ethylbenzene, X: Total Xylene isomers; measured by EPA method 8020/602.
TOG: Total oil and grease measured by Standard Method 5520 B/F.
<: Results reported as less than the detection limit.
NA: Not analyzed
*: Unregulated by California DHS, October 24, 1990.
MCL: State Maximum Contaminant Level.
DWAL: State recommended Drinking Water Action Level.

TABLE 3
CUMULATIVE RESULTS OF LABORATORY ANALYSES OF GROUNDWATER
FOR VOCs AND METALS
ARCO Station 374
6407 Telegraph Avenue
Oakland, California

Well / Date	VOC (ppb)	Cd (ppm)	Cr (ppm)	Pb (ppm)	Ni (ppm)	Zn (ppm)
MW-4						
07/31/90	Nondetectable (<1.0) for thirty-one compounds tested	NA	NA	NA	NA	NA
02/20/91	Chloromethane* 3.4; nondetectable NA for twenty eight other compounds tested (<0.5)	NA	NA	NA	NA	
11/20/91	NA	<0.010	<0.010	<0.005	<0.050	0.019

VOC results in micrograms per liter (μ/L) = parts per billion (ppb).
Metal results in milligrams per liter (mg/L) = parts per million (ppm).
Halogenated Volatile Organics measured by EPA method 601/8010.
NA = Not Analyzed.

TABLE 4
RESULTS OF GENERAL MINERAL ANALYSIS IN GROUNDWATER
ARCO Station 374
6074 Telegraph Avenue
Oakland, California
(October 4, 1990)

Constituent	MW-1	MCL
Chloride	+330	250 Rec 500 Up 600 St
Copper	<0.5	1.0
Iron	0.23	0.3
Manganese	+0.061	0.05
Sulfate	120	250 Rec 500 Up 600 St
Total Dissolved Solids	+1,000	250 Rec
Zinc	0.011	5.0

Results and values in parts per million (ppm) with the exception of Specific Conductance (micro-mhos/cm or micro-siemens/cm).
MCL: Maximum Contaminant Level for Secondary Drinking Water Standards established by Title 40 of the Code of Federal Regulation Section 143 and Title 22 Section 64445.1 of the California Administrative Code.
Rec: Recommended value.
Up: Upper value.
St: Value for short term use only.
+: Constituent in groundwater which exceeds established MCL.

TABLE 5
CUMULATIVE GROUNDWATER MONITORING DATA
ARCO Station 374
6407 Telegraph Avenue
Oakland, California
(Page 1 of 3)

Date Well Measured	Well Elevation	Depth to Water	Water Elevation	Floating Product
MW-1				
07/20/89	159.44	8.04	151.40	None
08/30/89		8.47	150.97	None
10/04/89		8.50	150.94	None
01/10/90		6.74	152.70	None
08/07/90		6.87	152.57	None
12/06/90		7.35	152.09	None
12/19/90		7.22	152.22	None
01/29/91		8.28	151.16	None
02/20/91		7.98	151.46	None
04/25/91		6.89	152.55	None
05/31/91		7.64	151.80	None
07/08/91		8.17	151.27	None
08/09/91		8.58	150.86	None
09/25/91		8.82	150.62	None
10/17/91		8.96	150.48	None
11/20/91		8.60	150.84	None
12/27/91		8.71	150.73	None
01/19/92		7.83	151.61	None
02/19/92		6.68	152.76	None
03/09/92		4.47	154.97	None
04/15/92	158.91*	6.44	152.47	None
MW-2				
07/20/89	158.46	8.15	150.31	None
08/30/89		8.42	150.04	None
10/04/89		8.40	150.06	None
01/10/90		6.12	152.34	None
08/07/90		6.35	152.11	None
12/06/90		7.15	151.31	None
12/19/90		7.38	151.08	None
01/29/01		8.41	150.05	None
02/20/91		8.26	150.20	None
04/25/91		7.70	150.76	NM
05/31/91		8.10	150.36	None
07/08/91		8.34	150.12	None
08/09/91		8.51	149.95	None
09/25/91		8.66	149.80	None
10/17/91		8.80	149.66	None
11/20/91		8.66	149.80	None
12/27/91		8.57	149.89	Sheen

See notes on page 3 of 3.

TABLE 5
CUMULATIVE GROUNDWATER MONITORING DATA
ARCO Station 374
6407 Telegraph Avenue
Oakland, California
(Page 2 of 3)

Date Well Measured	Well Elevation	Depth to Water	Water Elevation	Floating Product
MW-2 (cont.)				
01/19/92		8.25	150.21	None
02/19/92		7.50	150.96	None
03/09/92		7.40	151.06	None
04/15/92	157.92*	7.72	150.25	None
MW-3				
07/20/89	154.18	7.58	146.60	None
08/30/89		8.00	146.18	None
10/04/89		7.73	146.45	Emulsion
01/10/90		7.78	146.40	None
08/07/90		7.66	146.52	None
12/06/90		7.75	146.43	None
12/19/90		7.58	146.60	None
01/29/91		7.60	146.58	None
02/20/91		7.51	146.67	None
04/25/91		6.37	147.81	None
05/31/91		7.19	146.99	None
07/08/91		7.60	146.58	None
08/09/91		7.94	146.24	None
09/25/91		8.23	145.95	None
10/17/91		8.44	145.74	None
11/20/91		8.78	145.40	None
12/27/91		8.05	146.13	Sheen
01/19/92		7.65	146.53	None
02/19/92		6.48	147.70	None
03/09/92		5.45	148.73	None
04/15/92	153.64*	7.75	145.89	None
MW-4				
07/20/89	157.08	8.09	148.99	None
08/30/89		8.45	148.63	Sheen
10/04/89		8.57	148.51	Sheen
01/10/90		7.26	149.82	None
08/07/90		6.87	150.21	None
12/06/90		8.02	149.06	Sheen
12/19/90		7.69	149.39	None
01/29/91		8.39	148.69	Sheen

See notes on page 3 of 3.

TABLE 5
CUMULATIVE GROUNDWATER MONITORING DATA
ARCO Station 374
6407 Telegraph Avenue
Oakland, California
(Page 3 of 3)

Date Well Measured	Well Elevation	Depth to Water	Water Elevation	Floating Product
MW-4 (cont.)				
02/20/91		8.16	148.92	None
04/25/91		7.14	149.94	None
05/31/91		7.64	149.44	None
07/08/91		8.34	148.74	None
08/09/91		8.60	148.48	None
09/25/91		8.80	148.28	None
10/17/91		8.98	148.10	None
11/20/91		8.78	148.30	None
12/27/91		8.82	148.26	Sheen
01/19/92		8.18	148.90	None
02/19/92		7.62	149.46	None
03/09/92		6.68	150.40	None
04/15/92	156.53*	6.96	149.57	None
MW-5				
04/15/92	151.33*	8.05	143.28	None
MW-6				
04/15/92	153.84*	4.55	149.29	None

Elevations and DTW measured in feet.
* = Wellheads resurveyed by John E. Koch on April 27, 1992. Wellheads originally surveyed by Ron Archer, Civil Engineer, Inc. on July 28, 1989. The 1989 survey states: "Benchmark destroyed by handicap ramp so an assumed elevation of 142.80 was taken at the flowline of gutter at midpoint of return of southwest corner of intersection of Alcatraz Avenue and Racine Street where benchmark should have been." Approximate elevation.

APPENDIX A

Offsite Environmental Information Listing

VISTA ENVIRONMENTAL INFORMATION, INC.
3-RI-8393 RADIUS STATUS REPORT

Report Preparation Date: 5/14/92

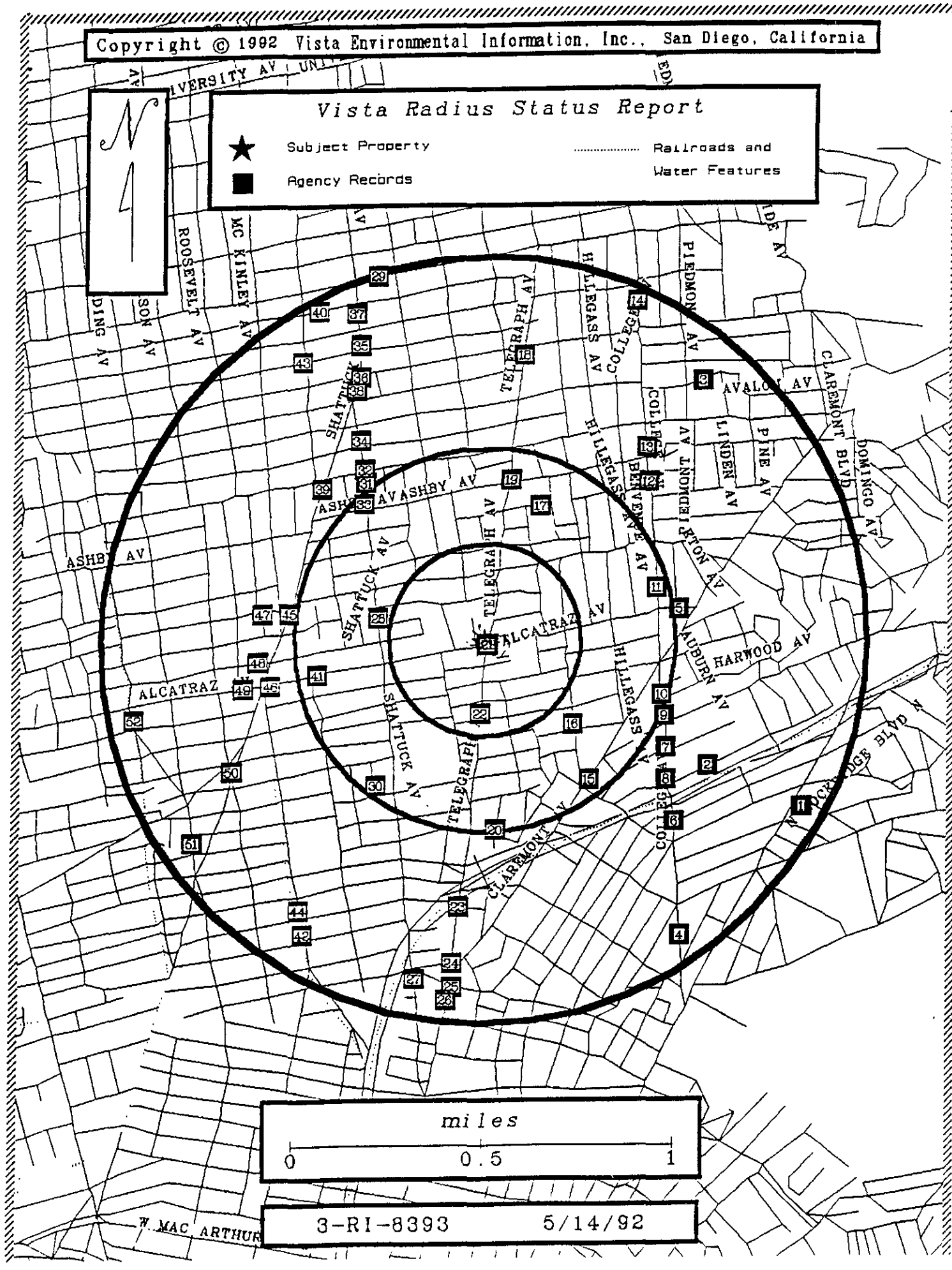
Loan #: RESNA Project #60025-5
Resna Industries
3315 Almaden Expressway, Ste. 34, San Jose, CA 95118

Loan Property: 6407 Telegraph Ave
Oakland, CA 94618

VISTA DATABASE SEARCH RESULTS

Database & Date	Agency & Type of Records	Records Located Within: 0 to 1/4 mi.	1/4 to 1/2 mi.	1/2 to 1 mi.	TOTAL
NPL 1/92	US EPA Superfund Sites	0	0	0	0
CERCLIS 1/92	US EPA Potential Superfund Sites	0	0	1	1
AWP 10/91	CAL. EPA Sites Authorized for Cleanup under the California Annual Work Plan	0	0	0	0
LUST various	CAL. REGIONAL WATER QUALITY CONTROL BOARD Leaking Underground Storage Tanks	3	8	24	35
SWIS 7/91	CAL. WASTE MGMT. BOARD Active/Inactive Sanitary Landfills/ Disposal Sites	0	0	0	0
CASITES 10/91	CAL. EPA Abandoned Site Program / AWP	0	10	23	33
	Total:	3	18	48	69

Note: Sites often have more than one environmental record.



LIST OF SITES AND RECORDS

3-RI-8393

5/14/92

SITE #	AGENCY & ID#	ENVIRONMENTAL RISK SITE AND DIRECTION FROM SUBJECT PROPERTY

WITHIN 1/4 MILE:

21 LUST — ARCO — OAKLAND
6407 TELEGRAPH AVE — Direction: --
Status Code: 5C: Pollution characterization underway.

21 LUST — GIVENS INVESTMENT COMPANY — OAKLAND
6398 TELEGRAPH AVE — Direction: --
Status Code: 0: No action.

22 LUST — THRIFTY OIL — OAKLAND
6125 TELEGRAPH AVE — Direction: S
Status Code: 5R: Remediation plan submitted.

WITHIN 1/4 TO 1/2 MILE:

10 LUST — SHELL — OAKLAND
6039 COLLEGE AVE — Direction: SE
Status Code: 3B: Preliminary site assessment underway.

11 LUST — BENZ SHOP — BERKELEY
3170 COLLEGE AVE — Direction: NE
Status Code: 3B: Preliminary site assessment underway.

17 LUST — ALTA BATES HOSPITAL — BERKELEY
3001 COLBY ST — Direction: NE
Status Code: 3B: Preliminary site assessment underway.

19 LUST — CHEVRON — BERKELEY
2996 TELEGRAPH AVE — Direction: N
Status Code: 5C: Pollution characterization underway.

28 LUST — SHATTUCK IMPORTS — OAKLAND
6562 SHATTUCK AVE — Direction: NW
Status Code: 0: No action.

33 LUST — SHELL — BERKELEY
2996 SHATTUCK AVE — Direction: NW
Status Code: 3B: Preliminary site assessment underway.

33 LUST — ARCO — BERKELEY
3000 SHATTUCK AVE — Direction: NW
Status Code: 0: No action.

SITE #	AGENCY & ID#	ENVIRONMENTAL RISK SITE AND DIRECTION FROM SUBJECT PROPERTY	
		WITHIN 1/4 TO 1/2 MILE:	
33	LUST	UNKNOWN 2076 ASHBY AVE Status Code: O: No action.	BERKELEY Direction: NW
15	CASITES 01760018	CLARKS REFINISHING 5200 CLAREMONT Status Code: NFA: No Further Action.	OAKLAND 94618 Direction: SE
15	CASITES 01760021	KAPS 5301 CLAREMONT AV Status Code: NFA: No Further Action.	OAKLAND 94618 Direction: SE
15	CASITES 01320018	WILD FLOWER & COMPANY 5400 CLAREMONT Status Code: NFA: No Further Action.	OAKLAND 94618 Direction: SE
16	CASITES 01500084	DAVANZO, LORNA 6019 COLBY ST Status Code: NFA: No Further Action.	OAKLAND 94609 Direction: SE
17	CASITES 01800019	WEBSTER ST. LABORATORY 2435 WEBSTER ST Status Code: NFA: No Further Action.	BERKELEY 94705 Direction: NE
17	CASITES 01800012	ALTA BATES HOSPITAL 3001 COLBY Status Code: NFA: No Further Action.	BERKELEY 94705 Direction: NE
20	CASITES 01420035	JAMES SLATON TRUCKING 5707 VICENTE ST Status Code: NFA: No Further Action.	OAKLAND 94618 Direction: S
30	CASITES 01330024	WHERE ENDS MEET 5926 WHITNEY ST Status Code: NFA: No Further Action.	OAKLAND 94609 Direction: SW
33	CASITES 01720074	SHATTUCK LAUNDERETTE 2973 SHATTUCK Status Code: NFA: No Further Action.	BERKELEY 94705 Direction: NW
41	CASITES 01730043	PHOTO LAB 1908 ALCATRAZ AV Status Code: NFA: No Further Action.	BERKELEY 94703 Direction: SW

WITHIN 1/2 TO 1 MILE:

50 CERCLIS GRANT LABORATORIES OAKLAND
CAD093982866 6020 ADELINE ST 94608 Direction: SW
Status Code: N: No futher remedial action planned on most recent event record.

1 LUST SHELL OAKLAND
5755 BROADWAY Direction: SE
Status Code: 3B: Preliminary site assessment underway.

2 LUST FIRE STATION #19 OAKLAND
5776 MILES AVE Direction: SE
Status Code: 3B: Preliminary site assessment underway.

4 LUST WILLIAM BROWN REALTY OAKLAND
5353 COLLEGE AVE Direction: SE
Status Code: 0: No action.

7 LUST CHEVRON OAKLAND
5800 COLLEGE AVE Direction: SE
Status Code: 5R: Remediation plan submitted.

9 LUST DRYER'S GRAND ICE CREAM OAKLAND
5929 COLLEGE AVE Direction: SE
Status Code: 3A: Preliminary site assessment workplan submitted.

18 LUST TONY & JOHN'S FOREIGN CARS BERKELEY
2730 TELEGRAPH AVE Direction: N
Status Code: 3B: Preliminary site assessment underway.

23 LUST CHEVRON OAKLAND
5500 TELEGRAPH AVE Direction: S
Status Code: 3B: Preliminary site assessment underway.

24 LUST AUTOPRO OAKLAND
5200 TELEGRAPH AVE Direction: S
Status Code: 3A: Preliminary site assessment workplan submitted.

25 LUST CHEVRON OAKLAND
5101 TELEGRAPH AVE Direction: S
Status Code: 3B: Preliminary site assessment underway.

27 LUST ARCO OAKLAND
5131 SHATTUCK AVE Direction: SW
Status Code: 0: No action.

SITE #	AGENCY & ID#	ENVIRONMENTAL RISK SITE AND DIRECTION FROM SUBJECT PROPERTY

WITHIN 1/2 TO 1 MILE:

31 LUST — NEWBERRY STATION, 2929 SHATTUCK AVE, BERKELEY — Direction: NW
Status Code: 0: No action.

32 LUST — SOUTHWICK CHRYSLER-PLYMOUTH, 2900 SHATTUCK AVE, BERKELEY — Direction: NW
Status Code: 0: No action.

36 LUST — MCKEVITT VOLVO, 2700 SHATTUCK AVE, BERKELEY — Direction: NW
Status Code: 0: No action.

37 LUST — SHIELD HEALTHCARE, 2567 SHATTUCK AVE, BERKELEY — Direction: NW
Status Code: 0: No action.

38 LUST — BEKINS VAN/STOR, 2721 SHATTUCK AVE, BERKELEY — Direction: NW
Status Code: 3B: Preliminary site assessment underway.

39 LUST — HUB PAINT CENTER, 2917 ADELINE ST, BERKELEY — Direction: NW
Status Code: 0: No action.

40 LUST — KALMAR PROPERTY, 2036 BLAKE ST, BERKELEY — Direction: NW
Status Code: 0: No action.

42 LUST — BP OIL, 5425 MARTIN LUTHER KING, OAKLAND — Direction: SW
Status Code: 0: No action.

42 LUST — MOBIL, 5425 GROVE ST, OAKLAND — Direction: SW
Status Code: 3B: Preliminary site assessment underway.

42 LUST — BP OIL, 5425 MARTIN LUTHER KING, OAKLAND — Direction: SW
Status Code: 0: No action.

43 LUST — UC FACILITIES MANAGEMENT DEPT, 2000 CARLETON ST, BERKELEY — Direction: NW
Status Code: 3B: Preliminary site assessment underway.

WITHIN 1/2 TO 1 MILE:

44	LUST	CHEVRON 5509 MARTIN LUTHER KING Status Code: 5C: Pollution characterization underway.	OAKLAND	Direction: SW
44	LUST	CHEVRON 5509 MARTIN LUTHER KING Status Code: 5C: Pollution characterization underway.	OAKLAND	Direction: SW
52	LUST	MOORE PROPERTY 3155 SACRAMENTO ST Status Code: 0: No action.	BERKELEY	Direction: SW
1	CASITES 01730022	C.C.W. DATA SYSTEMS 6043 LAWTON AV Status Code: NFA: No Further Action.	OAKLAND 94618	Direction: SE
3	CASITES 01500001	GLOBAL VENTURES 2807 STUART ST Status Code: NFA: No Further Action.	BERKELEY 94705	Direction: NE
5	CASITES 01730040	STUUM & DRANG DESIGN 2727 ALCATRAZ AV Status Code: NFA: No Further Action.	BERKELEY 94705	Direction: NE
6	CASITES 01730007	IMPAC PHOTO 5604 COLLEGE AV Status Code: NFA: No Further Action.	OAKLAND 94618	Direction: SE
8	CASITES 01760010	RYAN'S CUSTOM UPHOLSTERY 5711 COLLEGE AV Status Code: NFA: No Further Action.	OAKLAND 94618	Direction: SE
9	CASITES 01730083	EXPOSURE 5940 COLLEGE AV Status Code: NFA: No Further Action.	OAKLAND 94618	Direction: SE
12	CASITES 01720026	TULINIAN & SONS 2998 COLLEGE AV Status Code: NFA: No Further Action.	BERKELEY 94704	Direction: NE
13	CASITES 01720051	COLLEGE CLEANERS 2942 COLLEGE AV Status Code: NFA: No Further Action.	BERKELEY 94705	Direction: NE

SITE #	AGENCY & ID#	ENVIRONMENTAL RISK SITE AND DIRECTION FROM SUBJECT PROPERTY		
		WITHIN 1/2 TO 1 MILE:		
14	CASITES 01890015	EPIC WEST INC. 2640 COLLEGE AV Status Code: NFA: No Further Action.	BERKELEY 94705	Direction: NE
18	CASITES 01730029	DESIGN ENTERPRISES 2718 TELEGRAPH Status Code: NFA: No Further Action.	BERKELEY 94705	Direction: N
26	CASITES 01510011	MARKS PAINT SPOT 5025 TELEGRAPH AV Status Code: NFA: No Further Action.	OAKLAND 94609	Direction: S
29	CASITES 01500091	ANDREW D DARVAS, INC 2161 DWIGHT WY Status Code: NFA: No Further Action.	BERKELEY 94704	Direction: NW
34	CASITES 01280004	PEARSON-ELMER GENERAL PESTICIDES 2839 SHATTUCK PLACE Status Code: NFA: No Further Action.	BERKELEY 94709	Direction: NW
35	CASITES 01350070	PIMLOTT MACHINE SHOP 2619 SHATTUCK AV Status Code: NFA: No Further Action.	BERKELEY 94704	Direction: NW
40	CASITES 01300032	B B PLASTICS 2019 BLAKE ST Status Code: NFA: No Further Action.	BERKELEY 94704	Direction: NW
40	CASITES 01350082	M D S SOFT-PRO 2034 BLAKE ST Status Code: NFA: No Further Action.	BERKELEY 94704	Direction: NW
45	CASITES 01500003	AMERICAN UNICORN 3165 ADELINE ST Status Code: NFA: No Further Action.	BERKELEY 94703	Direction: W
46	CASITES 01720023	EUUELL BATES CLEANERS 1805 ALCATRAZ Status Code: NFA: No Further Action.	BERKELEY 94703	Direction: SW
47	CASITES 01730001	KESLEY TERMITES & PESTS 3140 HARPER Status Code: NFA: No Further Action.	BERKELEY 94703	Direction: W

SITE #	AGENCY & ID#	ENVIRONMENTAL RISK SITE AND DIRECTION FROM SUBJECT PROPERTY		
		WITHIN 1/2 TO 1 MILE:		
48	CASITES 01280056 Status Code: NFA: No Further Action.	TALLEY COSMETICS 1831 HARMON	BERKELEY 94703	Direction: W
49	CASITES 01360002 Status Code: NFA: No Further Action.	SIERRA SOUND LABS 1741 ALCATRAZ AV	BERKELEY 94703	Direction: SW
50	CASITES 01280062 Status Code: NFA: No Further Action.	GRANT LABORATORIES INC 6020 ADELINE ST	OAKLAND 94607	Direction: SW
51	CASITES 01510014 Status Code: NFA: No Further Action.	CORVIT PHARMACEUTICALS 5780 MARKET ST	OAKLAND 94607	Direction: SW

Mentions for report 3 - RI - 8393

Agency	City	Zip	St #	Street Name	Site Name	NFA?
CERCLIS	OAKLAND	94623		NAVAL SUPPLY CENTER OAKLAND	NAVY PUBLIC WORKS CENTER SAN FRANCISCO	NO
CERCLIS	OAKLAND	94606		EMBARCADERO CV MARINA SITE	PORT OF OAKLAND	Y
CERCLIS	OAKLAND	94621		OAKLAND ARPT	BUSINESS AIRCRAFT DISTR	Y
CERCLIS	OAKLAND	94621		OAKLAND ARPT	GOLDEN GATE AVIATION	Y
CERCLIS	OAKLAND	94621		OAKLAND ARPT	PACIFIC AIRMOTIVE	Y
AWP	OAKLAND			CODE 6 BUILDING 322	OAKLAND NAVAL SUPPLY CENTER	-
CASITES	BERKELEY	94710	820	GILMAN ST	FRANK'S TIRE SERVICE	NO
CASITES	OAKLAND	94625		CODE 6 BUILDING 322	OAKLAND NAVAL SUPPLY CENTER	NO
CASITES	OAKLAND	94607	412	MADISON	LAKESIDE NON-FERROUS	NO
CASITES	OAKLAND	94607		MARKET BETWEEN 1ST AND GROVE STREET	PG&E - OAKLAND	NO
CASITES	OAKLAND	94626		PORT OF OAKLAND	OAKLAND ARMY BASE	NO
CASITES	OAKLAND	94626		TULAGI ST.	OAKLAND ARMY BASE, WAREHOUSE AREA	NO
CASITES	BERKELEY	94710	2424	4TH ST	MATRECON INC	Y
CASITES	BERKELEY	94703	523	COVENTRY RD	DISCO CORPORATION	Y
CASITES	BERKELEY	94703	1925	GROVE ST	IMPAC PHOTO #2	Y
CASITES	BERKELEY	94705	11	KENTWORTH DR	JEWELRY FROM AROUND THE WORLD.	Y
CASITES	EMERYVILLE	94608	6901	CHRISTIE #405	INTERMODAL TRANSPORTATION SERVICE INC	Y
CASITES	OAKLAND	94623	1819	10TH	IRVING SUBWAY - DIVISION OF HARSCO CORP	Y
CASITES	OAKLAND	94607	1121	3RD ST	NOR-CAL METAL FABRICATORS	Y
CASITES	OAKLAND	94607	2588	GROVE ST	PETER LEAF CABINET MAKER	Y
CASITES	OAKLAND	94614		HANGER #5, OAKLAND INTERNATIONAL AIRPORT	POWER PAC ENGINEERING CORPORATION	Y
CASITES	OAKLAND	94614		HANGER #6, OAKLAND INTERNATIONAL AIRPORT	AIR CALIFORNIA	Y
CASITES	OAKLAND	94611	4139	JULIO	ALVAREZ & ORTIZ	Y
CASITES	OAKLAND	94602	314	MAPLE ST	SHIELD TERMITE	Y
CASITES	OAKLAND	94607		MARITIME STREET	GLOBAL INTERNATIONAL FORWARDERS	Y
CASITES	OAKLAND	94621		OAKLAND INTERNATIONAL AIRPORT, BLDG 118	BUSINESS AIRCRAFT DISTRIBUTORS	Y
CASITES	OAKLAND	94621		OAKLAND INTERNATIONAL AIRPORT, BLDG L230	PACIFIC AIRMOTIVE	Y
CASITES	OAKLAND	94621		OAKLAND INTERNATIONAL AIRPORT, BLDG L310	GOLDEN GATE AVIATION	Y
CASITES	OAKLAND	94662		PO BOX 8722	STAND COMPANY INDUSTRIES	Y
SWIS	BERKELEY			BET I80 & MARINA-NEAR THE RACETRACK	SANTA FE PACIFIC BERKELEY LANDFILL	-
SWIS	BERKELEY			FOOT OF VIRGINIA STREET; MARINA	URBAN ORE COMPOSTING	-
LUST 2	BERKELEY			2ND ST	IMPORT TILE SITE	NO
LUST 2	BERKELEY			6TH/GROVE&JEFFERSON	CALTRANS	NO
LUST 2	BERKELEY			ALS BLDG	UC BERKELEY LABORATORY	NO
LUST 2	BERKELEY			DELAWARE & VIRGINIA	SOUTHERN PACIFIC	NO

Agency	City	Zip	St #	Street Name	Site Name	NFA?
LUST 2	BERKELEY			TILDEN PARK	EAST BAY REGIONAL PARK	NO
LUST 2	OAKLAND				OAKLAND ARMY BASE	NO
LUST 2	OAKLAND			11TH ST	UNKNOWN	NO
LUST 2	OAKLAND			11TH ST	UNKNOWN	NO
LUST 2	OAKLAND			11TH STREET	UNKNOWN	NO
LUST 2	OAKLAND		5190	7TH ST	PORT OF OAKLAND	NO
LUST 2	OAKLAND		5110	7TH ST	CFS CORP	NO
LUST 2	OAKLAND		190	96TH AVE	MOUIS DRAZAGE CO.	NO
LUST 2	OAKLAND	94621		ASR #9 FACILITY	FAA AIRWAY FACILITY	NO
LUST 2	OAKLAND			EARHART RD	NATIONAL AIRMOTIVE	NO
LUST 2	OAKLAND			EARHART RD	NATIONAL AIROMOTIVE	NO
LUST 2	OAKLAND	94621		N/A L-827 TRACON	FAA AIRWAY FACILITIES	NO
LUST 2	OAKLAND			OAKLAND AIRPORT	AVIS RENT A CAR	NO
LUST 2	OAKLAND			OAKLAND AIRPORT	AVIS RENT A CAR	NO
LUST 2	OAKLAND			OAKLAND INTN'L AIR	CHEVRON	NO
LUST 2	OAKLAND			OAKLAND INTN'L AIR	CHEVRON	NO
LUST 2	OAKLAND			OAKPORT ST	EGMUD	NO
LUST 2	OAKLAND			OAKPORT ST	EBMUD	NO
LUST 2	OAKLAND			PETROLEUM ST	MOBIL	NO
LUST 2	OAKLAND			PETROLEUM ST	MOBIL	NO
LUST 2	OAKLAND			PINE ST	SOUTHERN PACIFIC	NO
LUST 2	OAKLAND			PINE ST	SOUTHERN PACIFIC	NO
LUST 2	OAKLAND			PORT OF OAKLAND	MOBIL BULK PLANT	NO
LUST 2	OAKLAND			PORT OF OAKLAND	MOBIL BULK PLANT	NO
LUST 2	OAKLAND			POWERHOUSE BLDG	CLAIRMONT RESORT	NO
LUST 2	OAKLAND			PRIVATE RD	SOUTHERN PACIFIC	NO
LUST 2	OAKLAND			TERMINAL FACILITY	SHELL	NO
LUST 2	OAKLAND			TERMINAL FACILITY	SHELL	NO
LUST 2	OAKLAND			TERMINAL FACILITY	SHELL	NO
LUST 2	OAKLAND			TIDEWATER AVE	TIDEWATER BUSINESS PARK	NO
LUST 2	OAKLAND			TIDEWATER AVE	TIDEWATER BUSINESS PARK	NO
LUST 2	OAKLAND			VALDEZ & 13TH	OLD OAKLAND TRIBUNE GARAGE	NO
LUST 2	OAKLAND			VALDEZ & 13TH	OLD OAKLAND TRIBUNE GARAGE	NO
LUST 2	OAKLAND			VALDEZ & 13TH	OLD OAKLAND TRIBUNE GARAGE	NO

NFA code descriptions: "-" indicates the agency did not supply this information; "Y" indicates there was "No Further Action" planned for the site (ASPIS/CAL-SITES) or "Case Closed" (LUST); "NO" indicates the agency did not mark the site "No Further Action" or "Case Closed", but does supply this information. For the CERCLIS database a "Y" indicates that all CERCLIS events for the site show an actual completion date and the most recent event indicates "no further remedial action planned."

APPENDIX B

Permits

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

LOCATION OF PROJECT ARCO 374
407 Telegraph Avenue
Oakland, CA 94621

CLIENT
Name ARCO Products Company
Address P.O. Box 5811 Phone (415) 571-2434
City San Mateo Zip 94402

APPLICANT
Name RESNA ATTn: Rob Campbell
Address 3315 Almaden Expy. Suite 34 Phone (408) 264-7723
City San Jose Zip 95118

TYPE OF PROJECT

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

PROPOSED WATER SUPPLY WELL USE

Domestic ___ Industrial ___ Other ___
Municipal ___ Irrigation ___

DRILLING METHOD:

Mud Rotary ___ Air Rotary ___ Auger X (hollow-stem)
Cable ___ Other ___

DRILLER'S LICENSE NO. 484288 (C-57)

WELL PROJECTS

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

GEOTECHNICAL PROJECTS

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

ESTIMATED STARTING DATE 4-1-92
ESTIMATED COMPLETION DATE 4-2-92

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

APPLICANT'S SIGNATURE Robert D. Campbell Date 3-23-92

FOR OFFICE USE

PERMIT NUMBER 92140
LOCATION NUMBER ___

PERMIT CONDITIONS

Circled Permit Requirements Apply

(A.) GENERAL

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

(B.) WATER WELLS, INCLUDING PIEZOMETERS

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

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

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

E. WELL DESTRUCTION. See attached.

Approved Wyman Hong Date 25 Mar 92
Wyman Hong

121989

REV. 6/90

CITY OF OAKLAND

PERMIT TO EXCAVATE IN STREETS OR OTHER WORK AS SPECIFIED

LOCATION OF WORK: ALCATRAZ (Street or Address) BETWEEN [illegible] (Street/Ave.) AND [illegible] (Specify)

PERMISSION TO EXCAVATE IN THE PUBLIC RIGHT-OF-WAY IS HEREBY GRANTED TO:

APPLICANT Gregg Drilling & Testing, Inc.

ADDRESS 2047 Heald Industrial Pkwy PHONE #: 510-670-6467

TYPE OF WORK: GAS____ ELECTRIC____ WATER____ TELEPHONE____ CABLE TV____ SEWER____ OTHER [illegible] (Specify)

NATURE OF WORK: 2 - 4" wells to 25'

P. Fee 180.00 TOTAL 180.00

OWNER/BUILDER

I hereby affirm that I am exempt from the Contractor's License Law for the following reason (Sec. 7031.5. Business and Professions Code: Any city or county which requires a permit to construct, alter, improve, demolish, or repair any structure, prior to it's issuance, also requires the applicant for such permit to file a signed statement that he is licensed pursuant to the provisions of the Contractor's License Law Chapter 9 (commencing with Sec. 7000) of Division 3 of the Business and Professions Code, or that he is exempt therefrom and the basis for the alleged exemption. Any violation of Section 7031.5 by any applicant for a permit subjects the applicant to a civil penalty of not more than $500):

☐ I, as owner of the property, or my employees with wages as their sole compensation, will do the work, and the structure is not intended or offered for sale (Sec. 70044, Business and Professions Code: The Contractor's License Law does not apply to an owner of property who builds or improves thereon, and who does such work himself or through his own employees, provided that such improvements are not intended or offered for sale. If, however, the building or improvement is sold within one year of completion, the owner-builder will have the burden of proving that he did not build or improve for the purpose of sale).

☐ I, as owner of the property, am exempt from the sole requirements of the above due to: (1) I am improving my principal place of residence or appurtenances thereto, (2) the work will be performed prior to sale. (3) I have resided in the residence for the 12 months prior to completion of the work, and (4) I have not claimed exemption in this subdivision on more than two structures more than once during any three-year period. (Sec. 7044. Business and Professions Code).

☐ I, as owner of the property, am exclusively contracting with licensed contractors to construct the project (Sec. 7044, Business and Professions Code: The Contractor's License Law does not apply to an owner of property who builds or improves thereon, and who contracts for such projects with a contractor(s) licensed pursuant to the Contractor's License Law).

☐ *I am exempt under Sec.* _____, *B&PC for this reason* _____

Signature Date

WORKER'S COMPENSATION

I hereby affirm that I have a certificate of consent to self-insure, or a certificate of Workers' Compensation Insurance, or a certified copy thereof (Sec. 3800, Lab C).

Policy # [illegible] Company Name Seneca Ins. Co.

☐ Certified copy is hereby furnished.

☐ Certified copy is filed with the city building inspection dept.

Signature Date

(This section need not be completed if the permit is for one hundred dollars ($100) or less.)

I certify that in the performance of the work for which this permit is issued, I shall not employ any person in any manner so as to become subject to the Workers' Compensation Laws of California.

Signature Date

NOTICE TO APPLICANT. If, after making this Certificate of Exemption, you should become subject to the Workers' Compensation provisions of the Labor Code, you must forthwith imply with such provisions or this permit shall be deemed revoked.

PERMIT VOID 90 DAYS FROM DATE OF ISSUE UNLESS EXTENSION GRANTED BY DIRECTOR OF PUBLIC WORKS.

Approximate Starting Date	DATE	4/1/92
Approximate Completion Date	DATE	~~07-31-92~~
HOLIDAY RESTRICTION (1 NOV — 1 JAN)	YES ____	NO ____
LIMITED OPERATION AREA (7AM – 9AM / 4PM – 6PM)	YES ____	NO ____
DATE STREET LAST RESURFACED	DATE	
SPECIAL PAVING DETAIL REQUIRED	YES ____	NO ____

24-HOUR EMERGENCY PHONE NUMBER 707-447-4033

PERMIT NOT VALID WITHOUT 24 HOUR NUMBER.

Telephone 238-3688 Forty-eight (48) HOURS BEFORE ACTUAL CONSTRUCTION.

ATTENTION

State law requires that contractor/owner call Underground Service Alert two working days before excavating to have below-ground utilities located. This permit is not valid uness applicant has secured an Inquiry Identification number issued by Underground Service Alert.

Call Toll Free: 800-642-2444 USA ID Number 101 52

This permit issued pursuant to all provisions of Chapter 8, Article 2 of the Oakland Municipal Code.

This permit is granted upon the express condition that the permittee shall be responsible for all claims and liabilities arising out of work performed under the permit or arising out of permittee's failure to perform the obligations with respect to street maintenance. The permittee shall, and by acceptance of the permit agrees to defend, indemnify, save and hold harmless the City, its officers and employees, from and against any and all suits, claims or actions brought by any person for or on account of any bodily injuries, disease or illness or damage to persons and/or property sustained or arising in the construction of the work performed under the permit or in consequence of permittee's failure to perform the obligations with respect to street maintenance.

CONTRACTOR

I hereby affirm that I am licensed under provisions of Chapter 9 (commencing with Section 7000) of Division 3 of the Business and Professions Code, and my license is in full force and effect.

LICENSE # AND CLASS 427416 C-57 CITY BUSINESS TAX # 20633

X _____ Date _____
Signature of Contractor Owner or Agent

☐ Agent for ☒ Contractor ☐ Owner

OFFICIAL USE ONLY

UTILITY COMPANY REPORT

Supervisor _____

Completion Date _____

#2 CITY INSPECTOR'S REPORT

	BACKFILL	PAVING
Initials		
Hours		
Date		
Concrete		
Asphalt		
Sidewalk		

Size of Cut: Sq. Ft. ____ Inches ____

Paved by ____ Type ____

Bill No. ____

Charges Backfill ____ Paving ____ Paving Insp. ____

Traffic Striping Replaced ____ Date

APPROVED

Engineering Services ____ Date ____

Planning ____ Date ____

Field Services ____ Date ____

Construction ____ Date ____

Traffic Engineering ____ Date ____

Electrical Engineering ____ Date ____

DIRECTOR OF PUBLIC WORKS

APPROVED BY: [signature]

DATE: 3-31-92

EXTENSION GRANTED BY: ____

DATE: ____

CITY OF OAKLAND
PERMIT TO EXCAVATE IN STREETS OR OTHER WORK AS SPECIFIED

LOCATION OF WORK: RUIN CT. (Street or Address) BETWEEN NEAR ACRO STATION ON TELEGRAPH (Street/Ave.) AND (Specify)

EXCV 150
PTEC 30
MTR 150
SEWER 150.00

PERMISSION TO EXCAVATE IN THE PUBLIC RIGHT-OF-WAY IS HEREBY GRANTED TO:

APPLICANT CREGG DRILLING & TESTING INC

ADDRESS 2247 ARNOLD IND. WAY #A PHONE #: 510)680-4992

TYPE OF WORK: GAS____ ELECTRIC____ WATER____ TELEPHONE____ CABLE TV____ SEWER____ OTHER MONITORING WELL (Specify)

NATURE OF WORK: 1-4" WELL 25' DEEP

OWNER/BUILDER

I hereby affirm that I am exempt from the Contractor's License Law for the following reason (Sec. 7031.5, Business and Professions Code: Any city or county which requires a permit to construct, alter, improve, demolish, or repair any structure, prior to it's issuance, also requires the applicant for such permit to file a signed statement that he is licensed pursuant to the provisions of the Contractor's License Law Chapter 9 (commencing with Sec. 7000) of Division 3 of the Business and Professions Code, or that he is exempt therefrom and the basis for the alleged exemption. Any violation of Section 7031.5 by any applicant for a permit subjects the applicant to a civil penalty of not more than $500):

☐ I, as owner of the property, or my employees with wages as their sole compensation, will do the work, and the structure is not intended or offered for sale (Sec. 70044, Business and Professions Code: The Contractor's License Law does not apply to an owner of property who builds or improves thereon, and who does such work himself or through his own employees, provided that such improvements are not intended or offered for sale. If, however, the building or improvement is sold within one year of completion, the owner-builder will have the burden of proving that he did not build or improve for the purpose of sale).

☐ I, as owner of the property, am exempt from the sale requirements of the above due to: (1) I am improving my principal place of residence or appurtenances thereto, (2) the work will be performed prior to sale. (3) I have resided in the residence for the 12 months prior to completion of the work, and (4) I have not claimed exemption in this subdivision on more than two structures more than once during any three-year period. (Sec. 7044, Business and Professions Code).

☐ I, as owner of the property, am exclusively contracting with licensed contractors to construct the project (Sec. 7044, Business and Professions Code: The Contractor's License Law does not apply to an owner of property who builds or improves thereon, and who contracts for such projects with a contractor(s) licensed pursuant to the Contractor's License Law).

☐ I am exempt under Sec. _____, B&PC for this reason _____

Signature Date

PERMIT VOID 90 DAYS FROM DATE OF ISSUE UNLESS EXTENSION GRANTED BY DIRECTOR OF PUBLIC WORKS.

Approximate Starting Date	DATE	4/1/92
Approximate Completion Date	DATE	4/1/92
HOLIDAY RESTRICTION (1 NOV — 1 JAN)	YES ____	NO ____
LIMITED OPERATION AREA (7AM – 9AM / 4PM – 6PM)	YES ____	NO ____
DATE STREET LAST RESURFACED	DATE	____
SPECIAL PAVING DETAIL REQUIRED	YES ____	NO ____

24-HOUR EMERGENCY PHONE NUMBER (510) 441-4033

PERMIT NOT VALID WITHOUT 24 HOUR NUMBER.

Telephone 238-3668 Forty-eight (48) HOURS BEFORE ACTUAL CONSTRUCTION.

ATTENTION

State law requires that contractor/owner call Underground Service Alert two working days before excavating to have below-ground utilities located. This permit is not valid unless applicant has secured an inquiry identification number issued by Underground Service Alert.

Call Toll Free: 800-642-2444 USA ID Number 50652

WORKER'S COMPENSATION

I hereby affirm that I have a certificate of consent to self-insure, or a certificate of Workers' Compensation Insurance, or a certified copy thereof (Sec. 3800, Lab C).

Policy # 30-7324430 Company Name AMSAFETY OF CA

☐ Certified copy is hereby furnished.

☑ Certified copy is filed with the city building inspection dept.

Signature Date 3-31-92

(This section need not be completed if the permit is for one hundred dollars ($100) or less.)

I certify that in the performance of the work for which this permit is issued, I shall not employ any person in any manner so as to become subject to the Workers' Compensation Laws of California.

Signature Date

NOTICE TO APPLICANT: If, after making this Certificate of Exemption, you should become subject to the Workers' Compensation provisions of the Labor Code, you must forthwith imply with such provisions or this permit shall be deemed revoked.

This permit issued pursuant to all provisions of Chapter 6, Article 2 of the Oakland Municipal Code.

This permit is granted upon the express condition that the permittee shall be responsible for all claims and liabilities arising out of work performed under the permit or arising out of permittee's failure to perform the obligations with respect to street maintenance. The permittee shall, and by acceptance of the permit agrees to defend, indemnify, save and hold harmless the City, its officers and employees, from and against any and all suits, claims or actions brought by any person for or on account of any bodily injuries, disease or illness or damage to persons and/or property sustained or arising in the construction of the work performed under the permit or in consequence of permittee's failure to perform the obligations with respect to street maintenance.

CONTRACTOR

I hereby affirm that I am licensed under provisions of Chapter 9 (commencing with Section 7000) of Division 3 of the Business and Professions Code, and my license is in full force and effect.

LICENSE # AND CLASS 457455 C57 CITY BUSINESS TAX # 555033

X _____ Date 3-30-92

Signature of Contractor Owner or Agent

☐ Agent for ☑ Contractor ☐ Owner

OFFICIAL USE ONLY

UTILITY COMPANY REPORT

Supervisor EXCV 150.00

Completion Date APPL 30.00

SURTL 180.00

CITY INSPECTOR'S REPORT 330.00

Initial(s)	BACKFILL	2	PAVING
	2CL	4010	15871TH

Hours ____

Date ____

Concrete ____

Asphalt ____

Sidewalk ____

Size of Cut: Sq. Ft. ____ Inches ____

Paved by ____ Type ____

Bill No. ____

Charges Backfill ____

Paving ____

Paving Insp. ____

Traffic Striping Replaced ____ Date

APPROVED

Engineering Services ____ Date ____

Planning ____ Date ____

Field Services ____ Date ____

Construction ____ Date ____

Traffic Engineering ____ Date ____

Electrical Engineering ____ Date ____

DIRECTOR OF PUBLIC WORKS

APPROVED BY: [signature]

DATE: 3-31-92

EXTENSION GRANTED BY: ____

DATE: ____

APPENDIX C

Field Methods

FIELD METHODS

The following presents RESNA's protocol for a typical site investigation involving gasoline hydrocarbon-impacted soil and/or groundwater.

Site Safety Plan

The Site Safety Plan describes the safety requirements for the evaluation of gasoline hydrocarbons in soil, groundwater, and the vadose-zone at the site. The Site Safety Plan is applicable to personnel of RESNA and its subcontractors. RESNA personnel and subcontractors of RESNA scheduled to perform 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 appropriate regulatory agency. In addition to the above-mentioned permits, encroachment permits from the City or State are acquired if drilling of borings offsite in the City or State streets is necessary. Copies of the permits are included in the appendix of the project 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 8- or 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 groundwater 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 can begin only after a conductor casing is properly installed and allowed to set, to seal the shallow aquifer.

Drill Cuttings

Drill cuttings subjectively evaluated as having hydrocarbon contamination at levels greater than 100 parts per million (ppm) are separated from those subjectively evaluated as having hydrocarbon contamination 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. The drill cuttings from the borings are placed in labeled 55-gallon drums approved by the Department of Transportation; or on plastic at the site, and covered with plastic. The cuttings remain the responsibility of the client.

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 be 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 created 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 2- or 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 0.020-inch-wide (typical) 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 groundwater monitoring wells are placed to allow monitoring during seasonal fluctuations of groundwater levels.

The annular space of each well is backfilled with No. 2 by 12 sand, or similar sorted 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.

Groundwater 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 included in reports. The wells are allowed to equilibrate for at least 48 hours after development prior to sampling. Water generated by well development will be stored in 17E Department of Transportation (DOT) 55-gallon drums onsite and will remain 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.

APPENDIX D

Chain of Custody
Laboratory Analysis Records

ARCO Products Company
Division of AtlanticRichfieldCompany

Task Order No. 374-91-25

Chain of Custody

ARCO Facility no 374 | City (Facility) Oakland

ARCO engineer Mike Whelan | Telephone no. (ARCO) (415) 571-7435

Consultant name RESNA INDUSTRIES INC | Address (Consultant) 3315 Almaden Expy. Suite 34 San Jose, CA 95118

Project manager (Consultant) Joel Coffman

Telephone no. (Consultant) (408) 264-7723

Fax no. (Consultant) (408) 264-2435

Laboratory name Sequoia

Contract number 07-073

Method of shipment

Special detection Limit/reporting

Special QA/QC

Remarks

Lab number

Sample I.D	Lab no	Container no.	Matrix: Soil	Matrix: Water	Matrix: Other	Preservation: Ice	Preservation: Acid	Sampling date	Sampling time	BTEX 602/EPA 8020	BTEX/TPH EPA M602/8020/8015	TPH Modified 8015 Gas ☐ Diesel ☐	Oil and Grease 413.1 ☐ 413.2 ☐	TPH EPA 418.1/SM503E	EPA 601/8010	EPA 624/8240	EPA 625/8270	TCLP Metals ☐ Ser VOA ☐ VOA ☐	CAM Metals EPA 6010/7000 TTLC ☐ STLC ☐	Lead Org./DHS ☐ Lead EPA ☐ 7420/7421 ☐	HOLD
[illegible]-B-6			X			X		4/1/92			X	-		1							
[illegible]-B-6			X			X		4/1/92													X
[illegible]-B-6			X			X		4/1/92													X
[illegible]-B-5			X			X		4/1/92			X										
[illegible]-B-5			X			X		4/1/92													X
[illegible]-B-5			X			X		4/1/92			X										
[illegible]-B-5			X			X		4/1/92													X
[illegible]-B-5			X			X		4/1/92													X

Condition of sample

Relinquished by sampler [signature] | Date 4/2/92 | Time 1000 | Received by [signature] | Temperature received

Relinquished by [signature] | Date 4/2/92 | Time 1650 | Received by [signature] @ 1130

Relinquished by | Date | Time | Received by

Received by laboratory | Date 4/2 | Time 1250

Turnaround time

- Priority Rush 1 Business Day ☐
- Rush 2 Business Days ☐
- Expedited 5 Business Days ☐
- Standard 10 Business Days ☑

Distribution: White copy — Laboratory; Canary copy — ARCO Environmental Engineering; Pink copy — Consultant

PPC-3292 (2-91)

SEQUOIA ANALYTICAL

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

RESNA
3315 Almaden Expwy., Suite 34
San Jose, CA 95118
Attention: Joel Coffman

Project: ARCO 374, Oakland

Enclosed are the results from 3 soil samples received at Sequoia Analytical on April 2,1992. The requested analyses are listed below:

SAMPLE #	SAMPLE DESCRIPTION	DATE OF COLLECTION	TEST METHOD
2040345	Soil, S-5.5-B-6	4/1/92	EPA 5030/8015/8020
2040346	Soil, S-5.5-B-5	4/1/92	EPA 5030/8015/8020
2040347	Soil, S-14.5-B-5	4/1/92	EPA 5030/8015/8020

Please contact me if you have any questions. In the meantime, thank you for the opportunity to work with you on this project.

Very truly yours,

SEQUOIA ANALYTICAL

Maria Lee

Maria Lee
Project Manager

SEQUOIA ANALYTICAL

680 C esapeake Drive • Redwood City, CA 94063
(415) C 64-9600 • FAX (415) 364-9233

RESNA	Client Project ID:	ARCO 374, Oakland	Sampled:	Apr 1, 1992
3315 Almaden Expwy., Suite 34	Matrix Descript:	Soil	Received:	Apr 2, 1992
San Jose, CA 95118	Analysis Method:	EPA 5030/8015/8020	Analyzed:	Apr 6, 1992
Attention: Joel Coffman	First Sample #:	204-0345	Reported:	Apr 14, 1992

TOTAL PETROLEUM FUEL HYDROCARBONS with BTEX DISTINCTION (EPA 8015/8020)

Sample Number	Sample Description	Low/Medium B.P. Hydrocarbons mg/kg (ppm)	Benzene mg/kg (ppm)	Toluene mg/kg (ppm)	Ethyl Benzene mg/kg (ppm)	Xylenes mg/kg (ppm)
204-0345	S-5.5-B-6	N.D.	N.D.	N.D.	N.D.	N.D.
204-0346	S-5.5-B-5	N.D.	N.D.	N.D.	N.D.	N.D.
204-0347	S-14.5-B-5	N.D.	N.D.	N.D.	N.D.	N.D.
Detection Limits:		**1.0**	**0.0050**	**0.0050**	**0.0050**	**0.0050**

Low to Medium Boiling Point Hydrocarbons are quantitated against a gasoline standard.
Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL

Maria Lee

Maria Lee
Project Manager

SEQUOIA ANALYTICAL

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

RESNA
3315 Almaden Expwy., Suite 34
San Jose, CA 95118
Attention: Joel Coffman

Client Project ID: ARCO 374, Oakland

QC Sample Group: 2040345-7

Reported: Apr 14, 1992

QUALITY CONTROL DATA REPORT

ANALYTE	Benzene	Toluene	Ethyl-benzene	Xylenes
Method:	EPA 8020	EPA 8020	EPA 8020	EPA 8020
Analyst:	L. Laikhtman	L. Laikhtman	L. Laikhtman	L. Laikhtman
Reporting Units:	mg/kg	mg/kg	mg/kg	mg/kg
Date Analyzed:	Apr 6, 1992	Apr 6, 1992	Apr 6, 1992	Apr 6, 1992
QC Sample #:	BLK040692	BLK040692	BLK040692	BLK040692
Sample Conc.:	N.D.	N.D.	N.D.	N.D.
Spike Conc. Added:	0.20	0.20	0.20	0.60
Conc. Matrix Spike:	0.22	0.21	0.21	0.63
Matrix Spike % Recovery:	110	105	105	105
Conc. Matrix Spike Dup.:	0.20	0.20	0.20	0.60
Matrix Spike Duplicate % Recovery:	100	100	100	100
Relative % Difference:	9.5	4.9	4.9	4.9

SEQUOIA ANALYTICAL

Maria Lee
Project Manager

% Recovery:	Conc. of M.S. - Conc. of Sample / Spike Conc. Added	x 100
Relative % Difference:	Conc. of M.S. - Conc. of M.S.D. / (Conc. of M.S. + Conc. of M.S.D.) / 2	x 100

EMCON ASSOCIATES
Consultants in Wastes Management and Environmental Control

RECEIVED
MAY 6 1992
RESNA
SAN JOSE

Date May 1, 1992
Project G70-04.01

To:
Mr. Joel Coffman
RESNA/ Applied Geosystems
3315 Almaden Expressway, Suite 34
San Jose, California 95050

We are enclosing:

Copies	Description
1	Depth To Water / Floating Product Survey Results
1	Summary of Groundwater Monitoring Data
1	Certified Analytical Reports with Chain-of-Custody
6	Water Sample Field Data Sheets

For your: X Information Sent by: X Mail

Comments:
Enclosed are the data from the second quarter 1992 monitoring event at ARCO service station 374, 6407 Telegraph Hill, Oakland, California. Please call if you have any questions: (408) 453-2266.

Mark Knuttel MK

Reviewed by:

REGISTERED PROFESSIONAL ENGINEER ROBERT CURTIS PORTER No. 4994 Exp. 6/30/92 INDUSTRIAL STATE OF CALIFORNIA

Robert C Porter

Robert Porter, Senior Project Engineer.

FIELD REPORT
DEPTH TO WATER / FLOATING PRODUCT SURVEY

PROJECT # : G70-04.01 STATION ADDRESS : 6407 Telegraph Hill, Oakland, CA DATE : 04-15-92

ARCO STATION # : 374 FIELD TECHNICIAN : JOHN WATAHA DAY : 04-15-92 WEDNESDAY

TW der	WELL ID	Well Box Seal	Well Lid Secure	Gasket	Lock	Locking Well Cap	FIRST DEPTH TO WATER (feet)	SECOND DEPTH TO WATER (feet)	DEPTH TO FLOATING PRODUCT (feet)	FLOATING PRODUCT THICKNESS (feet)	WELL TOTAL DEPTH (feet)	COMMENTS
1	MW-5	OK	OK	OK	NO LOCK	OK	8.05	8.04	NO	NO	23.00	—
2	MW-6	OK	OK	OK	NO LOCK	OK	4.55	4.55	NO	NO	14.60	—
3	MW-1	OK	OK	OK	3259	OK	6.44	6.45	NO	NO	26.50	—
4	MW-2	OK	OK	OK	3259	OK	7.72	7.72	NO	NO	26.20	REPLACED LOCKING WELL CAP
5	MW-4	OK	OK	OK	3259	OK	6.96	6.96	NO	NO	26.50	~~ORANGE PAINT~~ WELL LID CHIPPED
6	MW-3	OK	OK	OK	3259	OK	7.75	7.76	NO	NO	26.20	—

Summary of Groundwater Monitoring Data
Second Quarter 1992
ARCO Service Station 374
6407 Telegraph Hill, Oakland, California
micrograms per liter (µg/l) or parts per billion (ppb)

Well ID and Sample Depth	Sampling Date	Depth To Water (feet)	Floating Product Thickness (feet)	TPH[1] as Gasoline (ppb)	Benzene (ppb)	Toluene (ppb)	Ethyl-benzene (ppb)	Total Xylenes (ppb)
MW-1(24)	04/15/92	6.44	ND.[2]	<50	<0.5	<0.5	<0.5	<0.5
MW-2(25	04/15/92	7.72	ND.	86.	20.	2.3	3.8	8.5
MW-3(25)	04/15/92	7.75	ND.	1,600	200.	13.	110.	81.
MW-4(20)	04/15/92	6.96	ND.	8,500.	2,100.	750.	280.	1,000.
MW-5(22)	04/15/92	8.05	ND.	<50	<0.5	<0.5	<0.5	<0.5
MW-6(14)	04/15/92	4.55	ND.	<50	<0.5	<0.5	<0.5	<0.5
FB-1[3]	04/15/92	NA.[4]	NA.	<50	<0.5	<0.5	<0.5	<0.5

1. TPH. = Total petroleum hydrocarbons
2. ND. = Not detected
3. FB. = Field blank
4. NA. = Not applicable

Columbia Analytical Services inc.

April 28, 1992

Mark Knuttel
EMCON Associates
1921 Ringwood Avenue
San Jose, CA 95131

Re: **EMCON Project No. G70-04.01**
Arco Facility No. 374

Dear Mr. Knuttel:

Enclosed are the results of the water samples submitted to our lab on April 16, 1992. For your reference, our service request number for this work is SJ92-0450.

All analyses were performed in accordance with the laboratory's quality assurance program.

Please call if you have any questions.

Respectfully submitted:

Keoni A. Murphy
COLUMBIA ANALYTICAL SERVICES, INC.

le/KAM

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	EMCON Associates	**Date Received:**	04/16/92
Project:	EMCON Project No. G70-04.01	**Work Order #:**	SJ92-0450
	Arco Facility No. 374	**Sample Matrix:**	Water

BTEX and TPH as Gasoline
EPA Methods 5030/8020/DHS LUFT Method
µg/L (ppb)

Sample Name:		MW-1 (24)	MW-2 (25)	MW-3 (25)
Date Analyzed:		04/20/92	04/21/92	04/21/92
Analyte	**MRL**			
Benzene	0.5	ND	20.	200.
Toluene	0.5	ND	2.3	13.
Ethylbenzene	0.5	ND	3.8	110.
Total Xylenes	0.5	ND	8.5	81.
TPH as Gasoline	50	ND	86.	1,600.

TPH Total Petroleum Hydrocarbons
MRL Method Reporting Limit
ND None Detected at or above the method reporting limit

Approved by Karen A Murphy Date April 28, 1992

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	EMCON Associates	**Date Received:**	04/16/92
Project:	EMCON Project No. G70-04.01	**Work Order #:**	SJ92-0450
	Arco Facility No. 374	**Sample Matrix:**	Water

BTEX and TPH as Gasoline
EPA Methods 5030/8020/DHS LUFT Method
µg/L (ppb)

Sample Name:		MW-4 (20)	MW-5 (22)	MW-6 (14)
Date Analyzed:		04/23/92	04/20/92	04/20/92
Analyte	**MRL**			
Benzene	0.5	2,100.	ND	ND
Toluene	0.5	750.	ND	ND
Ethylbenzene	0.5	280.	ND	ND
Total Xylenes	0.5	1,000.	ND	ND
TPH as Gasoline	50	8,500.	ND	ND

TPH Total Petroleum Hydrocarbons
MRL Method Reporting Limit
ND None Detected at or above the method reporting limit

Approved by Kevin Murphy Date April 28, 1992

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	EMCON Associates	**Date Received:**	04/16/92
Project:	EMCON Project No. G70-04.01 Arco Facility No. 374	**Work Order #:** **Sample Matrix:**	SJ92-0450 Water

BTEX and TPH as Gasoline
EPA Methods 5030/8020/DHS LUFT Method
µg/L (ppb)

Sample Name:		Method Blank	Method Blank	Method Blank
Date Analyzed:		04/20/92	04/21/92	04/23/92
Analyte	**MRL**			
Benzene	0.5	ND	ND	ND
Toluene	0.5	ND	ND	ND
Ethylbenzene	0.5	ND	ND	ND
Total Xylenes	0.5	ND	ND	ND
TPH as Gasoline	50	ND	ND	ND

TPH Total Petroleum Hydrocarbons
MRL Method Reporting Limit
ND None Detected at or above the method reporting limit

Approved by Kevin Murphy Date April 28, 1992

APPENDIX A

LABORATORY QC RESULTS

Client: EMCON Associates
Project: EMCON Project No. G70-04.01
Arco Facility No. 374

Date Received: 04/16/92
Work Order #: SJ92-0450
Sample Matrix: Water

QA/QC Report
Surrogate Recovery Summary
BTEX and TPH as Gasoline
EPA Methods 5030/8020/DHS LUFT Method

Sample Name	Date Analyzed	Percent Recovery α,α,α-Trifluorotoluene
MW-1 (24)	04/20/92	88.
MW-2 (25)	04/21/92	91.
MW-3 (25)	04/21/92	102.
MW-4 (20)	04/23/92	83.
MW-5 (22)	04/20/92	94.
MW-6 (14)	04/20/92	87.
Method Blank	04/20/92	88.
Method Blank	04/21/92	91.
Method Blank	04/23/92	87.
	CAS Acceptance Criteria	70-130

TPH Total Petroleum Hydrocarbons

Approved by Kevin A Murphy Date April 28, 1992

APPENDIX B

CHAIN OF CUSTODY

[redacted] Products Company
[redacted] of Atl[redacted]

Task Order No. EMCGC-92-1

Chain of Custody

ARCO Facility no. 374	City (Facility) Oakland	Project manager (Consultant) Mark Knuttap	Laboratory name CAS
ARCO engineer Kyle Christie	Telephone no. (ARCO) 415-571-2434	Telephone no. (Consultant) 408-453-0719	Fax no. (Consultant) 408-453-0452
Consultant name EMCON ASSOCIATES	Address (Consultant) 1938 JUNCTION AVE. SAN JOSE, CA		Contract number 07077

Method of shipment: Sampler will deliver

Sample I.D.	Lab no.	Container no.	Matrix: Soil	Matrix: Water	Matrix: Other	Preservation: Ice	Preservation: Acid	Sampling date	Sampling time	BTEX 602/EPA 8020	BTEX/TPH 8015 EPA M602/8020/8015	TPH Modified 8015 Gas ☐ Diesel ☐	Oil and Grease 413.1 ☐ 413.2 ☐	TPH EPA 418.1/SM503E	EPA 601/8010	EPA 624/8240	EPA 625/8270	TCLP Metals ☐ Semi VOA ☐ VOA ☐	CAM Metals EPA 6010/7000 TTLC ☐ STLC ☐	Lead Org./DHS ☐ Lead EPA 7420/7421 ☐		
-1(24)	1-2	2		X		X	HCl	4-15-92	1415		X											
-2(25)	3-4	2		X		X	HCl	↓	1500		X											
-3(25)	5-6	2		X		X	HCl		1552		X											
-4(20)	7-8	2		X		X	HCl		1513		X											
-5(22)	9-10	2		X		X	HCl		1304		X											
-1(14)	11-12	2		X		X	HCl		1158		X											

Special detection Limit/reporting: Lowest possible

Special QA/QC: QS Normal

Remarks: TPHg / BTEX 2-40ml HCl VOAs per well G70-04.01

Lab number: 5592-0450

Condition of sample: OK

Temperature received: cool

Relinquished by sampler: John Okotaba	Date 04-16-92	Time	Received by:
Relinquished by:	Date	Time	Received by: 4-16-92 9:15
Relinquished by:	Date	Time	Received by laboratory: Date: Time:

Turnaround time

- Priority Rush 1 Business Day ☐
- Rush 2 Business Days ☐
- Expedited 5 Business Days ☐
- Standard 10 Business Days ☑

Distribution: White copy — Laboratory, Canary copy — ARCO Environmental Engineering; Pink copy — Consultant

3292 (2-91)

WATER SAMPLE FIELD DATA SHEET

Rev. 2, 5/91

EMCON ASSOCIATES

PROJECT NO: G70-04.01 SAMPLE ID: MW-1(24)

PURGED BY: J WATAHA CLIENT NAME: ARCO 374

SAMPLED BY: J WATAHA LOCATION: OAKLAND

TYPE: Ground Water X Surface Water ___ Treatment Effluent ___ Other ___

CASING DIAMETER (inches): 2 ___ 3 ___ 4 X 4.5 ___ 6 ___ Other ___

CASING ELEVATION (feet/MSL): NR VOLUME IN CASING (gal.): 13.15

DEPTH TO WATER (feet): 6.45 CALCULATED PURGE (gal.): 65.76

DEPTH OF WELL (feet): 26.50 ACTUAL PURGE VOL. (gal.): 45.00

DATE PURGED: 04-15-92 Start (2400 Hr) 1335 End (2400 Hr) 1355

DATE SAMPLED: 04-15-92 Start (2400 Hr) 1415 End (2400 Hr) 1417

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1339	13	6.68	1155	65.9	CLEAR	TRACE
1344	26	6.30	1196	65.7	SLIGHTLY CLOUDY	LIGHT
1349	39	6.33	1136	65.2	"	"
	52	DRIED WELL AT 45 GALLONS				
1414	AFTER RECHARGE	6.99	1042	65.5	SLIGHTLY CLOUDY	LIGHT

D. O. (ppm): NR ODOR: NONE

COLOR (COBALT 0 - 100): NR

TURBIDITY (NTU 0 - 200): NR

FIELD QC SAMPLES COLLECTED AT THIS WELL (i.e. FB-1, XDUP-1): FB-1 TAKEN HERE AT 1418

PURGING EQUIPMENT			SAMPLING EQUIPMENT		
___ 2" Bladder Pump	___ Bailer (Teflon®)		___ 2" Bladder Pump	X Bailer (Teflon®)	
X Centrifugal Pump	___ Bailer (PVC)		___ DDL Sampler	___ Bailer (Stainless Steel)	
___ Submersible Pump	___ Bailer (Stainless Steel)		___ Dipper	___ Submersible Pump	
___ Well Wizard™	___ Dedicated		___ Well Wizard™	___ Dedicated	
Other: ___			Other: ___		

WELL INTEGRITY: GOOD LOCK #: 3259

REMARKS: DRIED WELL AT 45 GALLONS
WATER LEVEL 19.58 AT 1412

Meter Calibration: Date: ___ Time: ___ Meter Serial #: ___ Temperature °F: ___

(EC 1000 ___ / ___) (DI ___) (pH 7 ___ / ___) (pH 10 ___ / ___) (pH 4 ___ / ___)

Location of previous calibration: MW-5

Signature: Jason Watahe Reviewed By: MK

WATER SAMPLE FIELD DATA SHEET

Rev. 2, 5/91

EMCON ASSOCIATES

PROJECT NO: 670-04.01 SAMPLE ID: MW-2 (25)

PURGED BY: J WATANG CLIENT NAME: ARCO 374

SAMPLED BY: J WATANG LOCATION: OAKLAND

TYPE: Ground Water X Surface Water ___ Treatment Effluent ___ Other ___

CASING DIAMETER (inches): 2 ___ 3 ___ 4 X 4.5 ___ 6 ___ Other ___

CASING ELEVATION (feet/MSL): NR VOLUME IN CASING (gal.): 12.12

DEPTH TO WATER (feet): 7.72 CALCULATED PURGE (gal.): 60.61

DEPTH OF WELL (feet): 26.20 ACTUAL PURGE VOL. (gal.): 45.00

DATE PURGED: 04-15-92 Start (2400 Hr) 1426 End (2400 Hr) 1446

DATE SAMPLED: 04-15-92 Start (2400 Hr) 1500 End (2400 Hr) 1502

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (Visual)	TURBIDITY (Visual)
1431	12	6.39	644	67.3	CLEAR	TRACE
1436	24	6.55	660	67.0	"	"
1440	36	6.78	705	67.4	"	"
	48	DRIED WELL AT 45 GALLONS				
1459	AFTER RECHARGE	6.92	840	66.4	CLEAR	TRACE

D. O. (ppm): NR ODOR: NONE NR (COBALT 0 - 100) NR (NTU 0 - 200)

FIELD QC SAMPLES COLLECTED AT THIS WELL (i.e. FB-1, XDUP-1): NR

PURGING EQUIPMENT		SAMPLING EQUIPMENT	
___ 2" Bladder Pump	___ Bailer (Teflon®)	___ 2" Bladder Pump	X Bailer (Teflon®)
X Centrifugal Pump	___ Bailer (PVC)	___ DDL Sampler	___ Bailer (Stainless Steel)
___ Submersible Pump	___ Bailer (Stainless Steel)	___ Dipper	___ Submersible Pump
___ Well Wizard™	___ Dedicated	___ Well Wizard™	___ Dedicated
Other: ___		Other: ___	

WELL INTEGRITY: GOOD LOCK #: 3259

REMARKS: DRIED WELL AT 45 GALLONS
WATER LEVEL 19.20 AT 1458

Meter Calibration: Date: ___ Time: ___ Meter Serial #: ___ Temperature °F: ___

(EC 1000 ___ / ___) (DI ___) (pH 7 ___ / ___) (pH 10 ___ / ___) (pH 4 ___ / ___)

Location of previous calibration: MW-6

Signature _ _ MK _ 2.10

WATER SAMPLE FIELD DATA SHEET

Rev. 2, 5/91

EMCON ASSOCIATES

PROJECT NO: 670-04.01 SAMPLE ID: MW-3 (25)

PURGED BY: J WATSON CLIENT NAME: ARCO 374

SAMPLED BY: J WATSON LOCATION: OAKLAND

TYPE: Ground Water X Surface Water ___ Treatment Effluent ___ Other ___

CASING DIAMETER (inches): 2 ___ 3 ___ 4 X 4.5 ___ 6 ___ Other ___

CASING ELEVATION (feet/MSL): NR VOLUME IN CASING (gal.): 12.42

DEPTH TO WATER (feet): 7.76 CALCULATED PURGE (gal.): 62.12

DEPTH OF WELL (feet): 26.70 ACTUAL PURGE VOL. (gal.): 35.00

DATE PURGED: 04-15-92 Start (2400 Hr) 1518 End (2400 Hr) 1535

DATE SAMPLED: 04-15-92 Start (2400 Hr) 1552 End (2400 Hr) 1553

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1523	12.50	6.04	751	65.4	CLEAR	TRACE
1528	25	6.11	782	65.0	"	"
		DRIED WELL AT 35 GALLONS				
1550	AFTER RECHARGE	6.87	773	64.0	GRAY	HEAVY

D. O. (ppm): NR ODOR: STRONG COLOR: NR (COBALT 0 - 100) TURBIDITY: NR (NTU 0 - 200)

FIELD QC SAMPLES COLLECTED AT THIS WELL (i.e. FB-1, XDUP-1): NE

PURGING EQUIPMENT		SAMPLING EQUIPMENT	
___ 2" Bladder Pump	___ Bailer (Teflon®)	___ 2" Bladder Pump	X Bailer (Teflon®)
X Centrifugal Pump	___ Bailer (PVC)	___ DDL Sampler	___ Bailer (Stainless Steel)
___ Submersible Pump	___ Bailer (Stainless Steel)	___ Dipper	___ Submersible Pump
___ Well Wizard™	___ Dedicated	___ Well Wizard™	___ Dedicated
Other: ___		Other: ___	

WELL INTEGRITY: GOOD LOCK #: 3259

REMARKS: DRIED WELL AT 35 GALLONS
WATER LEVEL AT 20.80 AT 1544

Meter Calibration: Date: ___ Time: ___ Meter Serial #: ___ Temperature °F: ___

(EC 1000 ___/___) (DI ___) (pH 7 ___/___) (pH 10 ___/___) (pH 4 ___/___)

Location of previous calibration: MW-5

Signature: [signature] Reviewed By: [signature] Page 3 of 10

WATER SAMPLE FIELD DATA SHEET

Rev. 2, 5/91

EMCON ASSOCIATES

PROJECT NO: 670-04.01 SAMPLE ID: MW-4 (20)

PURGED BY: M. Knuttel CLIENT NAME: ARCO 374

SAMPLED BY: M. Knuttel LOCATION: OAKLAND

TYPE: Ground Water ✓ Surface Water ____ Treatment Effluent ____ Other ____

CASING DIAMETER (Inches): 2 ____ 3 ____ 4 X 4.5 ____ 6 ____ Other ____

CASING ELEVATION (feet/MSL): NR VOLUME IN CASING (gal.): 12.74

DEPTH TO WATER (feet): 3FT 6.96 CALCULATED PURGE (gal.): ~~60~~ 63.70

DEPTH OF WELL (feet): 26.50 ACTUAL PURGE VOL. (gal.): 46.0

DATE PURGED: 4-15-92 Start (2400 Hr) 1440 End (2400 Hr) 1502

DATE SAMPLED: 4-15-92 Start (2400 Hr) 1513 End (2400 Hr) 1518

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (Visual)	TURBIDITY (Visual)
1446	13.0	6.80	1736	67.8	Green	heavy
1452	26.0	6.96	1669	66.3	"	"
1458	39.0	7.08	1380	65.8	"	"
~~1502~~	52.0	— Dry —				
1505	after recharge	7.30	1349	65.5	Green	light

D. O. (ppm): NR ODOR: Strong

COLOR: NR (COBALT 0 - 100) TURBIDITY: NR (NTU 0 - 200)

FIELD QC SAMPLES COLLECTED AT THIS WELL (i.e. FB-1, XDUP-1): NR

PURGING EQUIPMENT		SAMPLING EQUIPMENT	
____ 2" Bladder Pump	____ Bailer (Teflon®)	____ 2" Bladder Pump	✓ Bailer (Teflon®)
✓ Centrifugal Pump	____ Bailer (PVC)	____ DDL Sampler	____ Bailer (Stainless Steel)
____ Submersible Pump	____ Bailer (Stainless Steel)	____ Dipper	____ Submersible Pump
____ Well Wizard™	____ Dedicated	____ Well Wizard™	____ Dedicated
Other: ____		Other: ____	

WELL INTEGRITY: Good. Broken Diversified WD. LOCK #: 3259

REMARKS: Dried well at 46.0 gallons at 1502
WL at 21.50 at 1510. Samples collected

Meter Calibration: Date: 4-15-92 Time: 1430 Meter Serial #: 9105 Temperature °F: 69.2

EC 1000 1008 / 1000) (DI 9.62) (pH 7 7.02 / 7.0) (pH 10 10.05 / 10.0) (pH 4 4.02 / ✓).

Location of previous calibration: ____

WATER SAMPLE FIELD DATA SHEET

Rev. 2, 5/91

EMCON ASSOCIATES

PROJECT NO: G70-04.01 SAMPLE ID: MW-5 (22)

PURGED BY: J WATKINS CLIENT NAME: ARCO 374

SAMPLED BY: J WATKINS LOCATION: OAKLAND

TYPE: Ground Water X Surface Water ___ Treatment Effluent ___ Other ___

CASING DIAMETER (inches): 2 ___ 3 ___ 4 X 4.5 ___ 6 ___ Other ___

CASING ELEVATION (feet/MSL): NR VOLUME IN CASING (gal.): 9.81

DEPTH TO WATER (feet): 8.09 CALCULATED PURGE (gal.): 49.05

DEPTH OF WELL (feet): 23.00 ACTUAL PURGE VOL. (gal.): 29.00

DATE PURGED: 04-15-92 Start (2400 Hr) 1233 End (2400 Hr) 1244

DATE SAMPLED: 04-15-92 Start (2400 Hr) 1304 End (2400 Hr) 1305

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1237	10	6.60	895	67.5	SLIGHTLY CLOUDY	LIGHT
1241	20	6.77	926	66.2	"	"
		DRIED WELL AT 29 GALLONS				
1302	AFTER RECHARGE	7.31	919	66.9	LIGHT BROWN	HEAVY

D. O. (ppm): NR ODOR: NONE COLOR: NR (COBALT 0 - 100) TURBIDITY: NR (NTU 0 - 200)

FIELD QC SAMPLES COLLECTED AT THIS WELL (i.e. FB-1, XDUP-1): NR

PURGING EQUIPMENT		SAMPLING EQUIPMENT	
___ 2" Bladder Pump	___ Bailer (Teflon®)	___ 2" Bladder Pump	X Bailer (Teflon®)
X Centrifugal Pump	___ Bailer (PVC)	___ DDL Sampler	___ Bailer (Stainless Steel)
___ Submersible Pump	___ Bailer (Stainless Steel)	___ Dipper	___ Submersible Pump
___ Well Wizard™	___ Dedicated	___ Well Wizard™	___ Dedicated
Other: ___		Other: ___	

WELL INTEGRITY: GOOD LOCK #: NO LOCK

REMARKS: DRIED WELL AT 29 GALLONS
WATER LEVEL 13.29 AT 1259

Meter Calibration: Date: ___ Time: ___ Meter Serial #: ___ Temperature °F: ___

(EC 1000 ___ / ___) (DI ___) (pH 7 ___ / ___) (pH 10 ___ / ___) (pH 4 ___ / ___)

Location of previous calibration: MW-5

WATER SAMPLE FIELD DATA SHEET

Rev. 2, 5/91

EMCON ASSOCIATES

PROJECT NO: 670-04.01 SAMPLE ID: MW-6 (14)

PURGED BY: J WATSHA CLIENT NAME: ARCO 374

SAMPLED BY: J WATSHA LOCATION: OAKLAND

TYPE: Ground Water X Surface Water ___ Treatment Effluent ___ Other ___

CASING DIAMETER (inches): 2 ___ 3 ___ 4 X 4.5 ___ 6 ___ Other ___

CASING ELEVATION (feet/MSL): NR VOLUME IN CASING (gal.): 6.59

DEPTH TO WATER (feet): 4.55 CALCULATED PURGE (gal.): 32.95

DEPTH OF WELL (feet): 14.60 ACTUAL PURGE VOL. (gal.): 17.00

DATE PURGED: 04-15-92 Start (2400 Hr) 1133 End (2400 Hr) 1140

DATE SAMPLED: 04-15-92 Start (2400 Hr) 1159 End (2400 Hr) 1200

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1135	6.5	7.15	641	64.9	CLOUDY	HEAVY
1138	13	7.16	694	62.3	"	"
	19.5	DRIED WELL AT 17 GALLONS				
1157	AFTER RECHARGE	7.23	719	62.6	CLOUDY	HEAVY

D. O. (ppm): NR ODOR: NONE

COLOR (COBALT 0 - 100): NR

TURBIDITY (NTU 0 - 200): NR

FIELD QC SAMPLES COLLECTED AT THIS WELL (i.e. FB-1, XDUP-1): NR

PURGING EQUIPMENT		SAMPLING EQUIPMENT	
___ 2" Bladder Pump	___ Bailer (Teflon®)	___ 2" Bladder Pump	X Bailer (Teflon®)
X Centrifugal Pump	___ Bailer (PVC)	___ DDL Sampler	___ Bailer (Stainless Steel)
___ Submersible Pump	___ Bailer (Stainless Steel)	___ Dipper	___ Submersible Pump
___ Well Wizard™	___ Dedicated	___ Well Wizard™	___ Dedicated
Other: ___		Other: ___	

WELL INTEGRITY: GOOD LOCK #: NO LOCK

REMARKS: DRIED WELL AT 17 GALLONS
WATER LEVEL 10.15 AT 1155

Meter Calibration: Date: 04-15-92 Time: 1125 Meter Serial #: K9976134 Temperature °F: 66.7

(EC 1000 994 / 1000) (DI 3.24) (pH 7 6.96 / 7.00) (pH 10 9.94 / 10.00) (pH 4 3.90 / —)

Location of previous calibration: ___

Signature: [signature] Reviewed By: MK Page 6 of 6

APPENDIX E

Wellhead Survey

JOHN E. KOCH
Land Surveyor
CA. State Lic. No. LS4811
5427 Telegraph Ave., Suite A
Oakland, CA 94609
(510)655-9956
FAX(510)655-9745

RESNA
3315 Almaden Expressway, Suite 34
San Jose, CA 95118
(408)264-7723
FAX(408)264-2435

04/30/92

Tabulation of Elevations as of
04:30 p.m. 04/27/92

Job #92031
AGS Project 60025.05
Project Geologist:Joel Coffman
Site: Arco Station 374
6407 Telegraph Avenue
@ Alcatraz Avenue
Oakland,CA

BENCHMARK: Bench Mark (El.= 151.231') is a cut square found at center + - of curb return at the SW corner of Telegraph Avenue and 63rd Street.

MONITOR WELL DATA TABLE

Well Designation	Elevation	Description
MW-5	151.33	Top of PVC Casing
	151.79	Top of Box
MW-6	153.84	Top of PVC Casing
	154.29	Top of Box
MW-1	158.91	Top of PVC Casing
	159.11	Top of Box
MW-2	157.92	Top of PVC Casing
	158.19	Top of Box
MW-3	153.64	Top of PVC Casing
	153.89	Top of Box
MW-4	156.53	Top of PVC Casing
	156.78	Top of Box

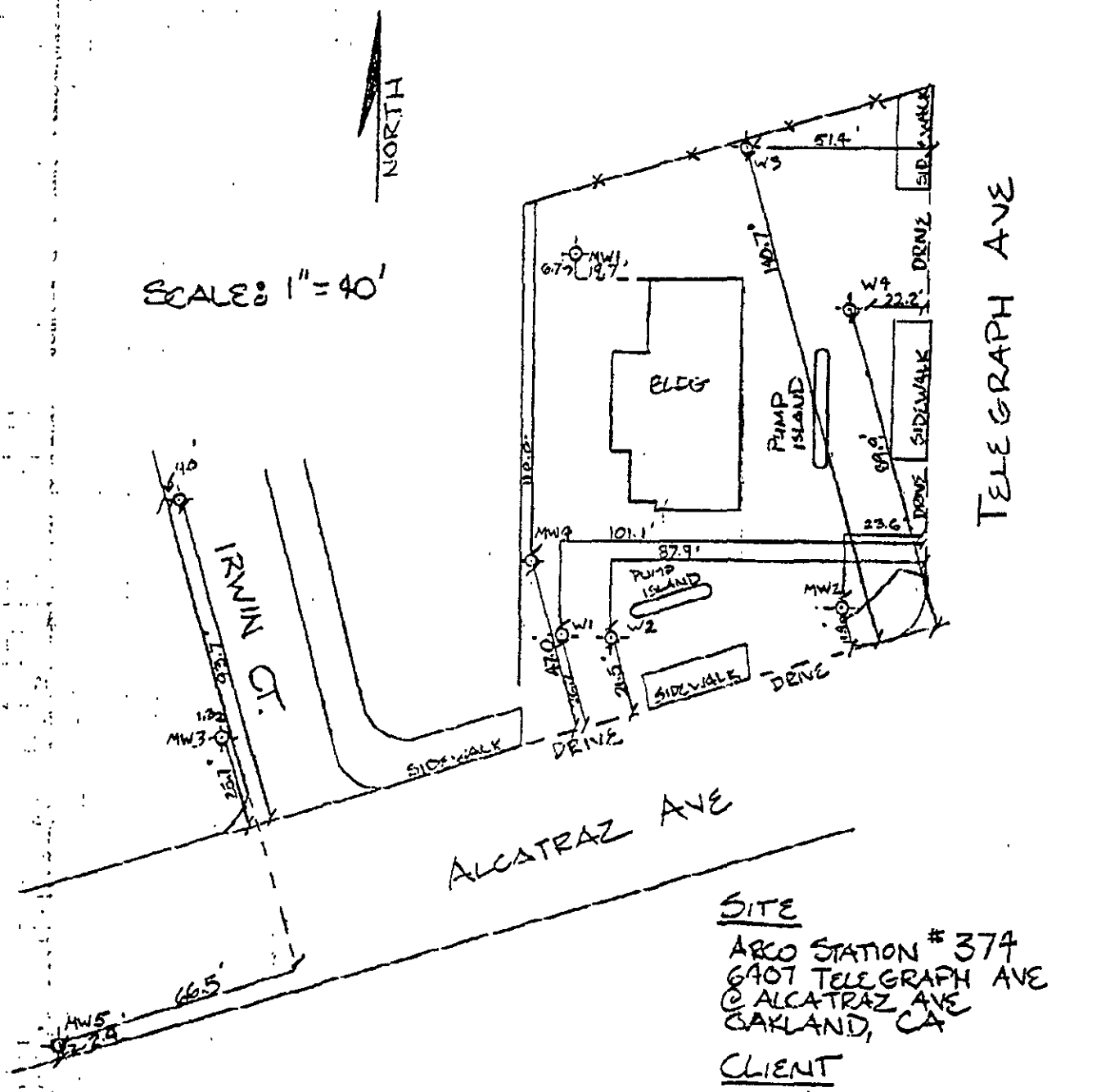
JOHN E. KOCH, P.L.S. AGS PROJECT #60025.05 JEK JOB #92031

Well Designation	Elevation	Description
W-1	155.76	Top of PVC Casing
	156.63	Top of Box
W-2	156.56	Top of PVC Casing
	157.37	Top of Box

NOTES:

1. Datum is City of Oakland = (USGS) +3.00'

2. TBM JEK #91031 is City of Oakland brass disc monument 32E/5 at the NE corner of Telegraph Avenue and 63rd Street.



ELEVATIONS

Well #	TOC	TOB
MW-1	158.91	159.11
MW-2	157.92	158.19
MW-3	153.64	153.89
MW-4	156.53	156.78
MW-5	151.33	151.79
MW-6	153.81	159.29
W-1	155.76	156.63
W-2	156.56	157.37

SITE

ARCO STATION # 374
6407 TELEGRAPH AVE
@ ALCATRAZ AVE
OAKLAND, CA

CLIENT

AGS/RESNA
3315 ALMADEN EXPWY
SUITE #34
SAN JOSE, CA
JOB # 600255.05

JOHN E. KOCH
CA LS # 4811
5427 TELEGRAPH AVE
OAKLAND, CA

JOB # 92031