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SOIL AND GROUNDWATER ASSESSMENT, SENSITIVE RECEPTOR SURVEY, TIER I RISK-ASSESSMENT AND CORRECTIVE ACTION PLAN

at

Oakland Truck Stop
8255 San Leandro Street
Oakland, California

Submitted by:
AQUA SCIENCE ENGINEERS, INC.
208 West El Pintado Road
Danville, CA 94526
(925) 820-9391

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1.0 INTRODUCTION

This submittal presents Aqua Science Engineers, Inc. (ASE's) soil and groundwater assessment and corrective action plan (CAP) at the Oakland Truck Stop located at 8255 San Leandro Street in Oakland, California (Figure 1). The proposed site assessment activities were initiated by Mr. Nissan Saidian, owner of the property, as requested by the Alameda County Health Care Services Agency (ACHCSA) in their letter dated July 27, 2000 (Appendix A). The site assessment activities were designed to further define the extent of soil and groundwater contamination at the site, to define sensitive receptors in the site vicinity, and to assess the risk associated with the presence of soil and groundwater contamination beneath the site.

2.0 BRIEF SITE HISTORY AND BACKGROUND INFORMATION

The subject site is currently a truck stop that has been in operation since the early 1960s.

2.1 March 1998 Underground Storage Tank (UST) Removal

In March 1998, W.A. Craig, Inc. removed one 500-gallon waste oil underground storage tank (UST) and two 4,000-gallon gasoline USTs from the site. Up to 460 parts per million (ppm) total petroleum hydrocarbons as gasoline (TPH-G), 930 ppm total petroleum hydrocarbons as diesel (TPH-D), 5.8 ppm benzene, 1.7 ppm toluene, 8.2 ppm ethyl benzene, 3.3 ppm total xylenes and 0.64 ppm methyl tertiary butyl ether (MTBE) were detected in soil samples collected from the gasoline UST excavations at the time of the removal. Up to 3,600 ppm TPH-G, 21,000 ppm TPH-D, 2.1 ppm benzene, 8 ppm toluene, 18 ppm ethyl benzene, 15 ppm total xylenes and 8.1 ppm MTBE were detected in soil samples collected from the waste oil UST excavation. Water samples collected from the UST excavations contained up to 5,500 parts per billion (ppb) TPH-G, 880,000 ppb TPH-D, 580 ppb benzene, 12 ppb toluene, 180 ppb ethyl benzene, 39 ppb total xylenes and 1,900 ppb MTBE. W.A. Craig reported that all contaminated soil from both the gasoline and waste oil UST excavations were removed based on visual, olfactory and photoionization detector readings. This contaminated soil was transported from the site for disposal in a Class II landfill. The excavations were backfilled with clean imported material.

2.2 February 1999 Soil and Groundwater Assessment

In February 1999, Penn Environmental drilled 13 soil borings at the site and constructed monitoring wells in four of the borings (Figure 2, from Penn Environmental report). Relatively low hydrocarbon concentrations were detected in soil samples collected near the former waste oil USTs, and relatively low to moderate hydrocarbon concentrations were detected in groundwater samples collected from these borings. Soil samples collected from borings B-4, B-6, B-8 and MW-3 contained TPH-G concentrations over 100 ppm and benzene concentrations over 1 ppm. All of these borings are in the vicinity of the existing gasoline USTs. Soil samples collected from the remaining borings contained much lower TPH-G and benzene, toluene, ethyl benzene, and total xylenes (collectively known as BTEX) concentrations in soil. Soil samples collected from all of the borings contained TPH-D concentrations over 100 ppm except for samples collected from borings B-7 and B-9, at the southern and western corners of the site. Up to 68,000 ppb TPH-G, 62,000 ppb TPH-D, 24,000 ppb benzene, 390 ppb toluene, 2,000 ppb ethyl benzene, 2,300 ppb total xylenes and 28,000 ppb MTBE were detected in groundwater samples collected from these monitoring wells/borings. Once again, the highest TPH-G and BTEX concentrations were in the wells/borings drilled near the existing USTs, although the highest TPH-D concentrations (between 25,000 ppb and 62,000 ppb) were detected in groundwater samples collected from monitoring well MW-1 and borings B-1 and B-2, all in the vicinity of the dispensers. Elevated MTBE concentrations (up to 7,800 ppb) were also detected in groundwater samples collected from borings in the dispenser area.

2.3 August 1999 Quarterly Groundwater Monitoring

In August 1999, ASE performed quarterly groundwater monitoring for the site. Monitoring well MW-1 contained free-floating diesel. Groundwater samples collected from monitoring well MW-3 contained 56,000 ppb TPH-G, 10,000 ppb TPH-D, 17,000 ppb benzene, 2,600 ppb toluene, 2,600 ppb ethyl benzene, 1,200 ppb total xylenes and 6,100 ppb MTBE. Much lower hydrocarbon concentrations were detected in groundwater samples collected from monitoring wells MW-2 and MW-4, located near the former waste oil USTs. In addition, the groundwater samples collected from monitoring wells MW-2 and MW-4, near the former waste oil USTs, were also analyzed for volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), polychlorinated bi-phenols (PCBs), cadmium, chromium, lead, nickel and zinc. No SVOCs, PCBs or VOCs were detected in these samples other than 11 ppb isopropyl benzene. The only

metal concentration that exceeded California Department of Health Services (DHS) maximum contaminant levels (MCLs) for drinking water was lead in the groundwater sample collected from monitoring well MW-4 at 260 ppb. The groundwater flow direction was to the west. See Tables One, Two and Three for tabulated results from this and subsequent groundwater samplings.

2.4 December 1999 Monitoring Well Installation

In December 1999, ASE constructed monitoring wells MW-5 and MW-6 at the site (Figure 3). Free-floating hydrocarbons were still present on the groundwater surface of monitoring well MW-1. High hydrocarbon concentrations, including benzene, ethyl benzene and MTBE concentrations exceeding DHS MCLs for drinking water, were detected in groundwater samples collected from monitoring well MW-2. Benzene concentrations in groundwater samples collected from monitoring wells MW-2 and MW-6 exceeded DHS MCLs for drinking water. The MTBE concentration in groundwater samples collected from monitoring wells MW-3, MW-4 and MW-5 also exceeded DHS MCLs for drinking water. MTBE was confirmed in monitoring well MW-3 by EPA Method 8260. Most of these concentrations were similar to previous results. No dissolved lead was detected in groundwater samples collected from monitoring well MW-4 this quarter. The groundwater flow direction was to the southwest.

2.5 March 2000 Quarterly Groundwater Monitoring

In March 2000, ASE conducted a groundwater monitoring event at the site. The analytical results from this sampling showed very similar hydrocarbon concentrations to the previous sampling results except that high MTBE concentrations (12,000 ppb) were detected in the groundwater sample collected from monitoring well MW-6. Free-floating hydrocarbons were still present in monitoring well MW-1.

2.6 May and June 2000 Soil and Groundwater Assessment

In May and June 2000, ASE drilled eight soil borings at the site (Figure 3). Soil samples collected from borings BH-A and BH-B contained TPH-G and TPH-D concentrations over 100 ppm. Boring BH-B also contained BTEX concentrations over 1 ppm, including 2.3 ppm benzene. Soil samples collected from borings BH-G and BH-H contained TPH-G over 100 ppm and over 1,000 ppm TPH-D; however, all of the BTEX concentrations were below 1 ppm. Soil samples collected from borings BH-C, BH-D, BH-E, and BH-F did not contain any significant concentrations of TPH-G, TPH-D or

BTEX. MTBE concentrations detected in soil samples collected from borings BH-C and BH-D exceeded 1 ppm. Lower concentrations of MTBE were detected in soil samples collected from borings BH-B, BH-G and BH-H. The analytical results are tabulated in Tables Four and Five.

Relatively high TPH-G, TPH-D and BTEX concentrations were detected in groundwater samples collected from borings BH-A and BH-B, west and southwest of the former USTs. Groundwater samples collected from these borings contained TPH-G as high as 51,000 ppb, TPH-D as high as 120,000 ppb and benzene as high as 4,000 ppb. The MTBE concentration in boring BH-A, which contained the highest BTEX concentrations, was only 46 ppb. Groundwater samples collected from borings BH-C, BH-D and BH-E, along the southern property line and south of the existing USTs, contained TPH-MO as high as 11,000 ppb, MTBE as high as 42,000 ppb and TBA as high as 6,800 ppb. No TPH-G or BTEX was detected in the groundwater samples collected from these borings. A very high TPH-D concentration of 2,200,000 ppb was detected in groundwater samples collected from boring BH-G, near the pump island. TPH-G and MTBE were also detected in groundwater samples collected from boring BH-G at 120,000 ppb and 170 ppb, respectively. This boring is east of monitoring well MW-1, which contains free-floating hydrocarbons. The remaining two borings, BH-F and BH-H, both drilled in the eastern portion of the property, contained TPH-D and/or TPH-MO at concentrations as high as 1,400 ppb, but did not contain detectable concentrations of BTEX or oxygenates. These analytical results are tabulated in Tables Six and Seven.

3.0 SCOPE OF WORK (SOW)

The purpose of this assessment was to further define the extent of soil and groundwater contamination at the site, to define sensitive receptors in the site vicinity, and to assess the risk associated with the presence of soil and groundwater contamination beneath the site. The scope of work for this project was to:

1) Obtain a drilling permit from the Alameda County Public Works Agency and an excavation permit from the City of Oakland to drill in San Leandro Street.

2) Contract with a subsurface utility locator to mark underground utility lines in the site vicinity.

3) Drill one soil boring east of the site in the eastern parking lane of San Leandro Street using a Geoprobe or similar type of drill rig. Collect soil and groundwater samples for analysis.

4) Following collection of the soil and groundwater samples, backfill the boring described in task 3 with neat cement placed by tremie pipe.

5) Drill three soil borings on the site using a hollow-stem auger drill rig. Collect soil samples for analysis.

6) Analyze at least one soil sample collected from each boring described in tasks 3 and 5 at a CAL-EPA certified analytical laboratory for TPH-G, TPH-D, TPH-MO, BTEX and fuel oxygenates by EPA Method 8260.

7) Construct groundwater monitoring wells in each boring described in task 5.

8) Develop each new monitoring well using surge block agitation and pump and/or bailer evacuation.

9) Collect groundwater samples from each of the nine site monitoring well for analyses, including the three new wells described is task 7.

10) Analyze the groundwater samples at a CAL-EPA certified analytical laboratory for TPH-G, TPH-D, TPH-MO, BTEX and fuel oxygenates by EPA Method 8260.

11) Survey the top of casing elevation of each new well relative to the existing site wells, and determine the groundwater flow direction and gradient beneath the site.

12) Conduct step drawdown and constant rate pumping tests for the site.

13) Conduct a survey of nearby receptors including surrounding buildings, surface water bodies and water supply wells within 2,000-feet of the site.

14) Prepare a report presenting results from this assessment.

4.0 DRILL ONE BORING IN SAN LEANDRO STREET FOR THE COLLECTION OF SOIL AND GROUNDWATER SAMPLES

4.1 Drilling Permit

Prior to drilling, ASE obtained Alameda County Public Works Agency (ACPWA) drilling permits and a City of Oakland excavation permit to allow for drilling in the site vicinity (Appendix B). ASE also notified Underground Service Alert (USA) to have underground public utilities in the vicinity of the site marked prior to drilling. A private subsurface utility locating firm, Subtronic Corporation, was also retained to locate underground utility lines.

4.2 Drill One Soil Boring East of the Site

On July 8, 2002, Gregg Drilling of Martinez, California made several attempts to drill a soil boring on the eastern parking lane of San Leandro Street to define the extent of soil and groundwater contamination to the east (Figure 4). Several attempts were made but drilling was met with refusal at relatively shallow depths in each instance. No further attempts could be made off the roadway since (a) it was not clear whether this location was part of the City of Oakland right-of-way and (b) the underground utility lines were not marked in this area.

5.0 INSTALL GROUNDWATER MONITORING AND EXTRACTION WELLS

5.1 Drilling Permits

Prior to drilling, ASE obtained an ACPWA drilling permit (Appendix B). ASE also notified USA to have underground public utilities in the vicinity of the site marked prior to drilling.

5.2 Drill Soil Borings for the Installation of Groundwater Monitoring and Extraction Wells

On July 8, 2002, Gregg Drilling of Martinez, California drilled soil borings MW-7 and MW-8 at the site with a Rhino drill rig equipped with 8-inch diameter hollow-stem augers (Figure 4). Boring MW-9 was drilled with the Rhino drill rig equipped with 10-inch diameter hollow-stem augers (Figure 4). Monitoring wells MW-7 and MW-8 were subsequently constructed in borings MW-7 and MW-8, respectively. Extraction well MW-9 was subsequently constructed in boring MW-9. ASE senior geologist

Robert Kitay, R.G, directed the drilling. These borings were located in the western and southern portions of the property to define the extent of contamination at the property limits in these directions. Extraction well MW-9 was constructed to allow for pumping tests and possible future groundwater remediation to take place.

During the drilling of borings MW-7 and MW-8, undisturbed soil samples were collected every 5-feet as drilling progressed for lithologic and hydrogeologic description and for possible chemical analysis. During the drilling of boring MW-9, soil samples were collected continuously to collect more precise lithologic and hydrogeologic data necessary for the construction of the groundwater extraction well. The samples were collected by driving a split-barrel sampler lined with 2-inch diameter brass tubes using hydraulic direct-push methods. Selective soil samples were immediately trimmed, sealed with Teflon tape and plastic end caps, labeled, and stored on ice for transport to Kiff Analytical, LLC (Kiff) of Davis, California (ELAP #2236) under appropriate chain of custody documentation. Soil from the remaining tubes was described by the site geologist using the Unified Soil Classification System (USCS) and was screened for volatile compounds using a photoionization detector (PID). The soil was screened by emptying soil from one of the sample tubes into a plastic bag. The bag was then sealed and placed in the sun for approximately 10 minutes. After the volatile compounds were allowed to volatilize, the PID measured the vapor in the bag through a small hole punched in the bag. PID readings are used as a screening tool only, since the procedures are not as rigorous as those used in the laboratory. The PID readings are listed on the boring logs presented in Appendix C.

Drilling equipment was cleaned with a TSP solution between sampling intervals to prevent potential cross-contamination.

5.3 Monitoring Well Construction

Monitoring wells MW-7 and MW-8 were constructed in the borings with 2-inch diameter, 0.020-inch slotted, flush-threaded, schedule 40 PVC well screen and blank casing. Monitoring well MW-7 is screened between 5-feet bgs and 16.5-feet bgs. Monitoring well MW-8 is screened between 5-feet bgs and 15-feet bgs. Both of these wells were constructed to monitor the first water bearing zone encountered. Number 3 washed Monterey sand occupies the annular space between the borehole and the casing from the bottom of the boring to approximately 1-foot above the well screen. A 1-foot thick hydrated bentonite layer separates the sand from the overlying cement surface seal. The wellheads are secured with locking

wellplugs beneath at-grade traffic-rated well boxes. Well construction details are shown on the boring logs in Appendix C.

5.4 Extraction Well Construction

Monitoring well MW-9 was constructed with 4-inch diameter, 0.020-inch slotted, flush-threaded, schedule 40 PVC well screen and blank casing. The well is screened between 5-feet bgs and 20-feet bgs to monitor the first water bearing zone encountered. Number 3 washed Monterey sand occupies the annular space between the borehole and the casing from the bottom of the boring to approximately 1-foot above the well screen. A 1-foot thick hydrated bentonite layer separates the sand from the overlying cement surface seal. The wellhead is secured with a locking wellplug beneath an at-grade, traffic-rated well box. Well construction details are shown on the boring logs in Appendix C.

5.5 Well Development

On July 11, 2002, ASE associate geologist Erik Paddleford developed wells MW-7, MW-8 and MW-9 using two episodes of surge-block agitation and submersible pump evacuation. Over ten well casing volumes of water were removed from the wells during development, and evacuation continued until the water was relatively clear. Well development purge water was contained in sealed and labeled 55-gallon steel drums and left on-site for temporary storage until off-site disposal could be arranged. No free-floating hydrocarbons or sheen were present on the surface of groundwater during well development.

5.6 Monitoring Well Sampling

On September 4, 2002, ASE associate geologist Erik Paddleford collected groundwater samples from wells MW-2 through MW-9 for analysis. Monitoring well MW-1 contained 0.54-feet of free-floating hydrocarbons and therefore was not sampled. No free-floating hydrocarbons or sheen were present on the surface of groundwater in any of the remaining wells. Prior to sampling, the wells were purged of three well casing volumes of groundwater. The pH, temperature, and conductivity of the purge water were monitored during evacuation, and samples were not collected until these parameters stabilized. Groundwater samples were removed from the monitoring wells with factory-cleaned, unused polyethylene bailers. The groundwater samples were contained in 40-ml volatile organic analysis (VOA) vials, preserved with hydrochloric acid, and sealed without headspace. The samples were then labeled and stored with ice for

transport to Kiff under chain of custody. Well sampling purge water was contained in sealed and labeled 55-gallon steel drums and left on-site for temporary storage until off-site disposal could be arranged. The well sampling field logs are presented in Appendix D.

6.0 ANALYTICAL RESULTS FOR SOIL AND GROUNDWATER

6.1 Soil Sample Analysis

The soil samples collected from 10.5-feet bgs in boring MW-7, 11.0-feet bgs in boring MW-8, and 13.0-feet bgs in boring MW-9 were analyzed by Kiff for TPH-D and TPH-MO by modified EPA Method 8015, and TPH-G, BTEX, and the oxygenates MTBE, DIPE, ETBE, TAME and TBA by EPA Method 8260B. The analytical results are tabulated in Tables Three and Four. The certified analytical report and chain of custody are presented in Appendix E.

No compounds were detected in the soil sample collected from 10.5-feet bgs in MW-7. The only hydrocarbon concentration detected in the soil sample collected from 11.0-feet bgs in MW-8 was 3.9 ppm TPH-D. The soil sample collected from 13.0-feet bgs in MW-9 contained 15 ppm TPH-MO, 0.0058 ppm MTBE and 0.0051 ppm TBA. No other hydrocarbons were detected.

6.2 Groundwater Sample Analysis

The groundwater samples collected from wells MW-2 through MW-9 were analyzed by Kiff for TPH-D by modified EPA Method 8015, and TPH-G, BTEX, and the oxygenates MTBE, DIPE, ETBE, TAME and TBA by EPA Method 8260B. Analytical results are tabulated in Table Two. The laboratory analytical report and chain of custody documents are presented in Appendix F.

The groundwater samples collected from monitoring well MW-2 contained 910 ppb TPH-G, 510 ppb TPH-D, 1.6 ppb benzene, 45 ppb MTBE, 2.5 ppb DIPE, and 67 ppb TBA. The groundwater samples collected from monitoring well MW-3 contained 24,000 ppb TPH-G, 17,000 ppb TPH-D, 11,000 ppb benzene, 140 ppb ethyl benzene, 3,200 ppb MTBE, and 1,400 ppb TBA. The groundwater samples collected from monitoring well MW-4 contained 1,100 ppb TPH-D, 150 ppb MTBE, and 18 ppb TBA. The groundwater samples collected from monitoring well MW-5 contained 92 ppb TPH-G, 6,100 ppb TPH-D, 370 ppb MTBE, 3.6 ppb DIPE, and 72 ppb TBA. The groundwater samples collected from monitoring well MW-6

contained 50,000 ppb TPH-D, 140 ppb benzene, 21,000 ppb MTBE, 52 ppb TAME, and 7,500 ppb TBA. The groundwater samples collected from monitoring well MW-7 contained 130 ppb TPH-D and 3.4 ppb MTBE. The groundwater samples collected from monitoring well MW-8 contained 170 ppb TPH-D, although the hydrocarbons did not exhibit a typical diesl pattern. The groundwater sample collected from monitoring well MW-9 contained 1,000 ppb TPH-D, 12,000 ppb MTBE, 70 ppb TAME, and 1,700 ppb TBA.

7.0 GROUNDWATER ELEVATIONS

The top of casing elevation, ground surface elevation and longitude and latitude location of each well were surveyed by Mid Coast Engineers of Watsonville, California on July 11, 2002. A copy of the survey is included as Appendix G. Depth to groundwater measurements are presented in Table One. A groundwater elevation (potentiometric surface) contour map for July 11, 2002 is presented as Figure 5. On July 11, 2002, groundwater appeared to flow to the west/northwest beneath the site at a gradient of 0.002-feet/foot.

8.0 SENSITIVE RECEPTOR SURVEY

ASE researched whether any surface water bodies or water supply wells are located within 2,000-feet of the site. The study area is plotted on Figure 6.

8.1 Surface Water Survey

(WCST. Nat)

Directly behind the site lies a small, unnamed creek. This creek appears to provide drainage and is very heavily vegetated. Given the flat topography in the area and location of the San Francisco Bay, it is likely that this creek is tidally influenced. This is the likely explanation as to why the groundwater gradient beneath the site is highly variable.

8.2 Area Well Survey

ASE conducted an area well survey to locate water supply wells within a 2,000-foot radius of the site. The locations of the wells are shown on Figure 6. These wells were located by reviewing records from the California Department of Water Resources (DWR), the Alameda County Public Works Agency and the California Geotracker database. Well information is tabulated in Table Seven. Monitoring wells were excluded from the search.

Three wells were identified within the search area. One of the wells is used for industrial purposes and two are used for irrigation. It is unknown whether these wells are still in use. No domestic or municipal water supply wells were located within the search area.

9.0 FEASIBILITY TESTS

Feasibility tests included a step drawdown pumping test and constant rate pumping test.

9.1 Step Drawdown Pumping Test

The step drawdown test was conducted by Gary D. Lowe, R.G., C.E.G., C.HG. of H_2O Geol of Livermore, California on August 8, 2002. A copy of the report for this test is presented in Appendix H. Pumping rates of 0.5 gallons per minute (gpm), 1 gpm and 2 gpm were used for the step-drawdown pumping test. Based on the results of the step-drawdown test, a pumping rate of 1 gpm was selected for the constant rate pumping test.

9.2 Constant Rate Pumping Test

A 605-minute constant rate pumping test was conducted by Gary D. Lowe, R.G., C.E.G., C.HG. of H_2O Geol of Livermore, California on August 27, 2002. A copy of the report for this test is presented in Appendix H. Based on the results of the step-drawdown test, a pumping rate of 1 gpm was selected for the constant rate pumping test. Water was pumped from extraction well MW-9 and water levels were monitored in the remaining site wells during the duration of the test. The actual average pumping rate during the test was 1.08 gpm.

The pumping well (MW-9), as well as monitoring wells MW-3, MW-6 and MW-8 experienced drawdown in response to the test. The distance drawdown relationship among the monitoring wells in response to the pumping was inconsistent with a drawdown of 0.15-feet in monitoring well MW-3 located 49.14-feet from the pumping well and a drawdown of 0.59-feet in monitoring well MW-8 located 65.8-feet from the pumping well. This apparent anisotropy is attributed to the presence of the tank excavation and a pipeline trench along the southeast property boundary. The hydraulic conductivity of the wells that experienced drawdown ranged from 2.45 feet/day to 7.6 feet/day. These hydraulic conductivity calculations, however, represent a combination of the hydraulics of the

tank excavation and pipeline trench as well as the semi-confined silt sand aquifer.

Because of the influence from the tank backfill and pipeline trench, actual sustainable hydraulic properties for the site can not be calculated without conducting a very long pump test (over 12,000 minutes) and completely dewatering the excavation and pipeline trench, which may not be possible at all. The test did show, however, that the pipeline trench could be used to capture water at the downgradient edge of the property and that this trench may potentially act as a cutoff barrier to impede groundwater flow off-site to the south. The trench backfill may also be a possible conduit for the movement of contamination toward the creek behind the site.

10.0 TIER I RISK-ASSESSMENT

The workplan approval letter from the ACHCSA dated February 22, 2001 requested that a Tier I Human Health Risk Assessment (HRA) be conducted for the site.

The Tier I HRA was conducted by comparing the concentrations detected in soil and groundwater at the site with Risk-Based Screening Levels (RBSLs) published in the "Application of Risk-Based Screening Levels and Decision Making to Sites With Impacted Soil and Groundwater" document prepared by the California Regional Water Quality Control Board, San Francisco Bay Region (RWQCB) dated December 2001. These RBSLs include not only human health criteria but also parameters for aquatic life protection, odor ceiling values, etc. Since there are no domestic or municipal water supply wells in the site vicinity, and since it is unlikely that groundwater in the site vicinity will ever be used for drinking water, ASE is comparing the hydrocarbon concentrations detected at the site to RBSLs for sites where groundwater is not a current or potential source of drinking water.

Benzene, MTBE, TPH-G and TPH-D concentrations detected in groundwater samples collected from the site wells exceeded RBSLs for sites where groundwater is not a current or potential source of drinking water. ASE then compared the concentrations for these four compounds to the "indoor air impacts" concentrations in Table F-2 in Volume 2 of the RBSL document to determine whether the hydrocarbon concentrations detected at the site may be a threat to human health based on volatilization of hydrocarbons into indoor air. The benzene concentration detected in groundwater from monitoring well MW-3 exceeded the RBSL regardless of soil type. All of the MTBE concentrations, however, did not exceed any

indoor air impact criteria. No indoor impact criteria has been established for TPH-G and TPH-D.

Based on the Tier I HRA, the benzene concentration detected in groundwater samples collected from monitoring well MW-3 could present a threat to human health if a building were built on this location. It should also be noted that the benzene concentrations at the property boundaries, including MW-9 did not exceed the human health risk criteria, showing that this potential risk is limited only to the site at this time. TPH-G, TPH-D, benzene and MTBE concentrations detected in several wells at the site exceeded RBSLs for other non-human health criteria including ceiling values and aquatic life protection.

11.0 REMEDIAL OPTIONS

The following lists typical remediation options for soil and groundwater contamination from petroleum-hydrocarbons currently in use in northern California.

11.1 Soil Overexcavation

This remedial option involves the excavation of contaminated soil and either treating the soil on-site or transporting the soil to an off-site treatment or disposal facility. On-site soil treatment is usually by aeration or bioremediation. Advantages of this method is that it is the fastest and most effective method in treating contaminated soil, and removes contaminated soil which could act as a source for groundwater contamination. The disadvantages of this method are that (a) it would require the closure of the on-site business for an extended period of time, (b) it may require the removal of soil surrounding the UST and fuel dispensing system (possibly endangering the integrity of these systems), (c) it may cause significant nuisance odors, and possibly unhealthy hydrocarbon concentrations in the air in the site vicinity, (d) it does not directly remediate contaminated groundwater beneath the site, and (e) is very expensive at properties where USTs are still in service.

Given the disadvantages of this method, this method is not seen as a viable remediation alternative for the site at this time.

11.2 Air Sparge and Soil Vapor Extraction

Soil vapor extraction remediation entails the removal of hydrocarbons from the ground in-situ. These vapors are removed through vapor

extraction wells placed in contaminated areas. The vapors are removed through wells by a vacuum source and abated by one of several methods such as an internal combustion (IC) engine, a thermal oxidizer or carbon absorption.

Vapor extraction technology is often used in conjunction with air sparging. Air sparging is the injection of air beneath the water table, generally at the bottom of an unconfined aquifer. Air bubbles rise through the saturated zone volatilizing hydrocarbons and forcing the hydrocarbons into the vadose (unsaturated) zone. The hydrocarbons are then subsequently removed from the vadose zone using soil vapor extraction. The addition of air through air sparging may also stimulate bioremediation.

Although no vapor extraction feasibility test was conducted at the site, the clay rich sediments in the vadose zone do not appear to be conducive to vapor extraction. Conventional air sparging remediation requires the removal of hydrocarbons from the vadose zone with soil vapor extraction once they have volatilized from the saturated zone; therefore, it does not appear that air sparging/soil vapor extraction would be a suitable remediation alternative for the site.

Based on the soil conditions in the vadose zone, air sparging and soil vapor extraction should be eliminated for consideration as a remediation alternative for the site.

11.3 Groundwater "Pump and Treat"

Groundwater "pump and treat" is a method in which contaminated groundwater is pumped from a pumping well to the surface and then treated in one of several ways such as air stripping, carbon absorption, ultraviolet (UV) peroxidation, etc. prior to disposal. Historically, "pump and treat" has had limited success in groundwater remediation for several reasons, particularly that hydrocarbons have a high affinity to soil, that soil in the capillary zone often goes untreated, and that it takes long periods of time to remove significant volumes of hydrocarbons when the hydrocarbon concentrations in groundwater are in the parts per billion range. "Pump and treat" is, however, considered an effective method of containing a plume and preventing further migration of contamination downgradient. This is because the water table is drawn down and groundwater surrounding the pumping wells flow toward the pumping well.

The pumping test at the site showed that fill material in a utility line at the southern property boundary could likely act as a suitable cut-off boundary. For this reason, "pump and treat" would have a potential as being a viable remediation alternative for the site. However, a much longer pumping test would be required to properly design a "pump and treat" remediation system for the site. This pump test would need to be for a duration of at least 12,000-minutes. Besides the need for additional data to properly design an effective "pump and treat" remediation system, the MTBE and TBA concentrations that would have to be treated are relatively high and will make "pump and treat" an expensive remediation alternative. For this reason, ASE recommends that other remediation alternatives be explored prior to any further consideration being given to "pump and treat" as the preferred remediation alternative

For these reasons, "pump and treat" should not be considered as a remediation option for the site at this time until other potential remediation alternatives are explored.

11.4 In-Situ Bioremediation

There are several options to achieve in-situ bioremediation, which involves increasing the amount of dissolved oxygen in the groundwater to enhance naturally occurring aerobic bacterial degradation of petroleum hydrocarbons in-situ. It has been known for some time that naturally occurring bacteria readily degrade (digest) petroleum hydrocarbons into harmless byproducts. Although anaerobic bacteria will degrade petroleum hydrocarbons, the rate is much slower than with aerobic bacteria. Depleted levels of oxygen appear to be the primary limiting factor for aerobic bacterial activity. Two common methods of increasing dissolved oxygen in groundwater are injection of hydrogen peroxide and one-time application of Oxygen Releasing Compound (ORC). Advantages for this type of remediation include (a) it is very low cost, (b) it is a passive, unintrusive method for groundwater remediation, (c) there is little or no equipment to maintain, and (d) it often works very quickly. Disadvantages include (a) it is not effective at all sites since it is very dependent on groundwater flow rates, (b) soil remediation is also required using these methods, (c) in-situ bioremediation is not typically as effective on MTBE as on other hydrocarbons, and (d) additional applications may be required if using ORC.

Although bioremediation may be an effective remedial option for the site, its success will be limited by the remaining hydrocarbon source in the unsaturated zone. Bioremediation is generally only effective in soils with

high moisture content, and the unsaturated soil in the vadose zone will remain untreated. For this reason, ASE is not considering the use of in-situ bioremediation as a primary remediation option for the site at this time.

11.5 In-Situ Chemical Oxidation

In-situ chemical oxidation/reduction involves injecting an oxidant to the subsurface, which will destroy organic hydrocarbons. The three most common oxidants are peroxide, permanganate and ozone. Oxidation using liquid hydrogen peroxide in the presence of ferrous iron (native or supplemental) produces Fenton's Reagent, which yields free hydroxyl radicals, which is a strong oxidizer. These strong oxidants can rapidly degrade a variety of organic compounds. Permanganate can cause numerous complex reactions that can destroy organic compounds. The use of either peroxide or permanganate requires the injection of liquid into the water bearing zone and/or vadose zone. The low permeability clay-rich soils in the vadose zone beneath the site will not accept these liquids. This would allow potential remediation in the sandy water bearing zone, but will have little effect in the potential source of contamination in the vadose zone.

Ozone, however, is injected as a gas into sparging wells. Ozone can oxidize contaminants directly or through the formation of hydroxyl radicals, much the same way as peroxide. In situ decomposition of ozone can also lead to beneficial oxygenation and biostimulation. Although conventional air sparging was ruled out as a feasible remediation alternative for the site due to the inability to vapor extract in the vadose zone, sparging itself may work for ozone injection since soil vapor extraction is not required. In addition, since a gas is injected, it may be possible for some remediation to also take place in the vadose zone as well. Although no air sparging test has been completed for the site, based on the lithology, and results of the pumping test, it is likely that ozone sparging would be possible at the site.

In-situ chemical oxidation, namely by ozone sparging, appears to be a viable means of remediation for the site. This method would be much more cost effective than "pump and treat" and may also allow for remediation in the vadose zone in the source areas.

12.0 SELECTION OF REMEDIATION TECHNOLOGY

Based on the available remediation options, ASE recommends ozone sparging as a remediation alternative for the site. This remediation alternative should allow for remediation in the water-bearing zone, and possibly may have some effect on remediation in the vadose zone as well. Assuming that the ACHCSA concurs with this selection, ASE recommends that a remedial action plan (RAP) be prepared presenting a specific design for an ozone sparging system.

13.0 REPORT LIMITATIONS

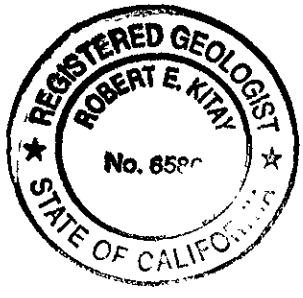
The results presented in this report represent conditions at the time of the soil and groundwater sampling, at the specific locations where the samples were collected, and for the specific parameters analyzed by the laboratory. It does not fully characterize the site for contamination resulting from unknown sources, or for parameters not analyzed by the laboratory. All of the laboratory work cited in this report was prepared under the direction of an independent CAL-EPA certified laboratory. The independent laboratory is solely responsible for the contents and conclusions of the chemical analysis data.

The pumping test in this report was prepared by H_2O Geol of Livermore, California. H_2O Geol is solely responsible for the contents and conclusions of the pump test report.

Should you have any questions or comments, please call us at (925) 820-9391.

Respectfully submitted,

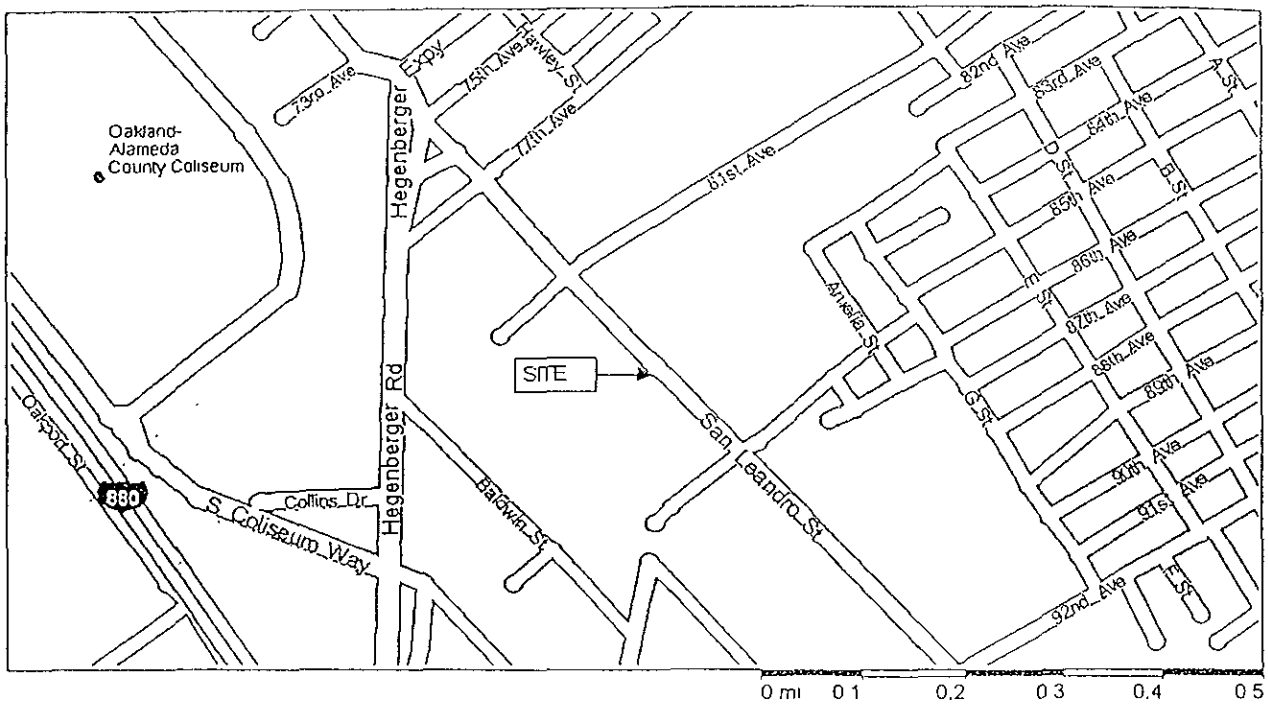
AQUA SCIENCE ENGINEERS, INC.



Robert E. Kitay, R.G., R.E.A.
Senior Geologist

FIGURES

NORTH

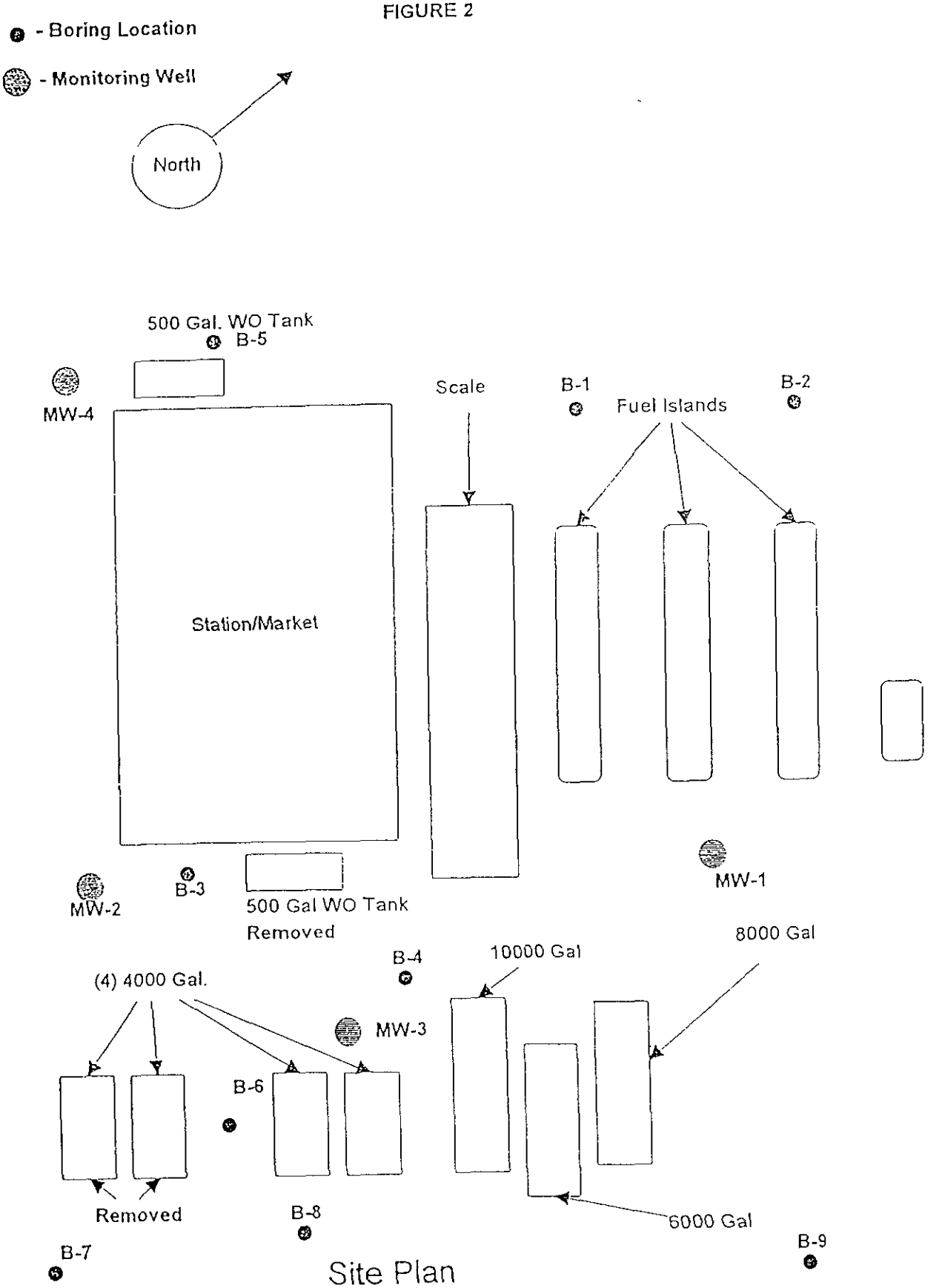


LOCATION MAP

OAKLAND TRUCK STOP
8255 SAN LEANDRO STREET
OAKLAND, CALIFORNIA

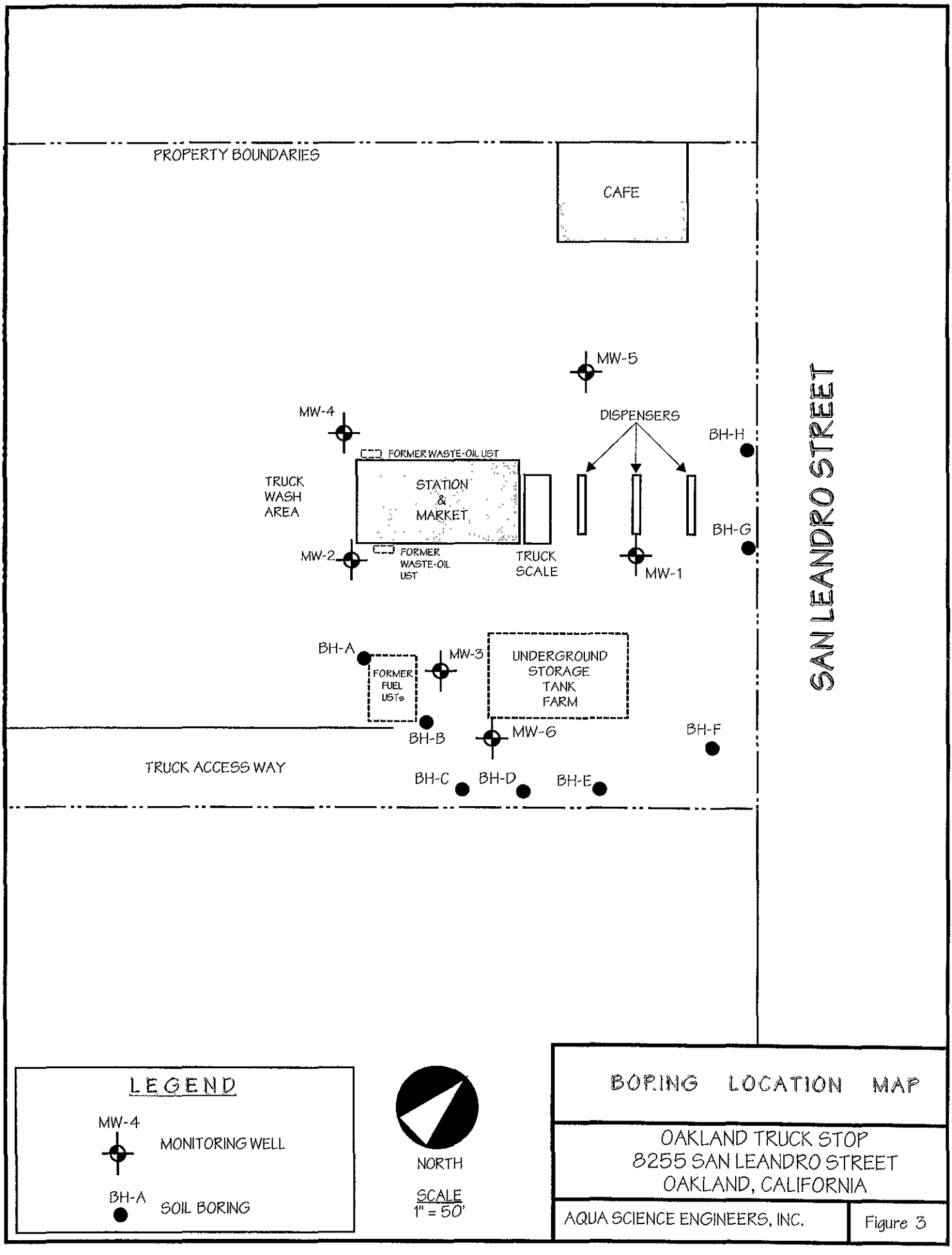
AQUA SCIENCE ENGINEERS, INC | Figure 1

FIGURE 2



Site Plan

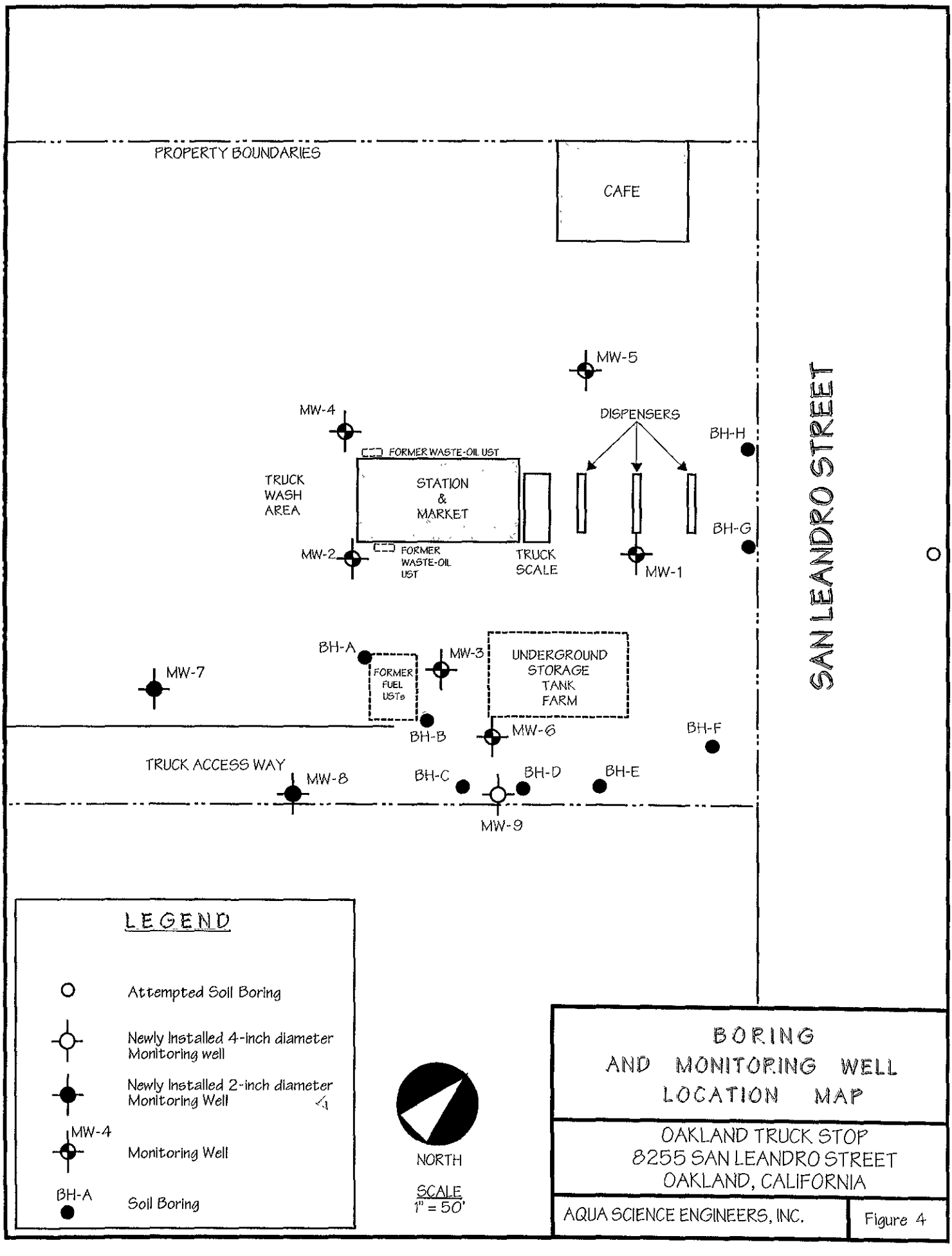
8255 San Leandro St., Oakland CA

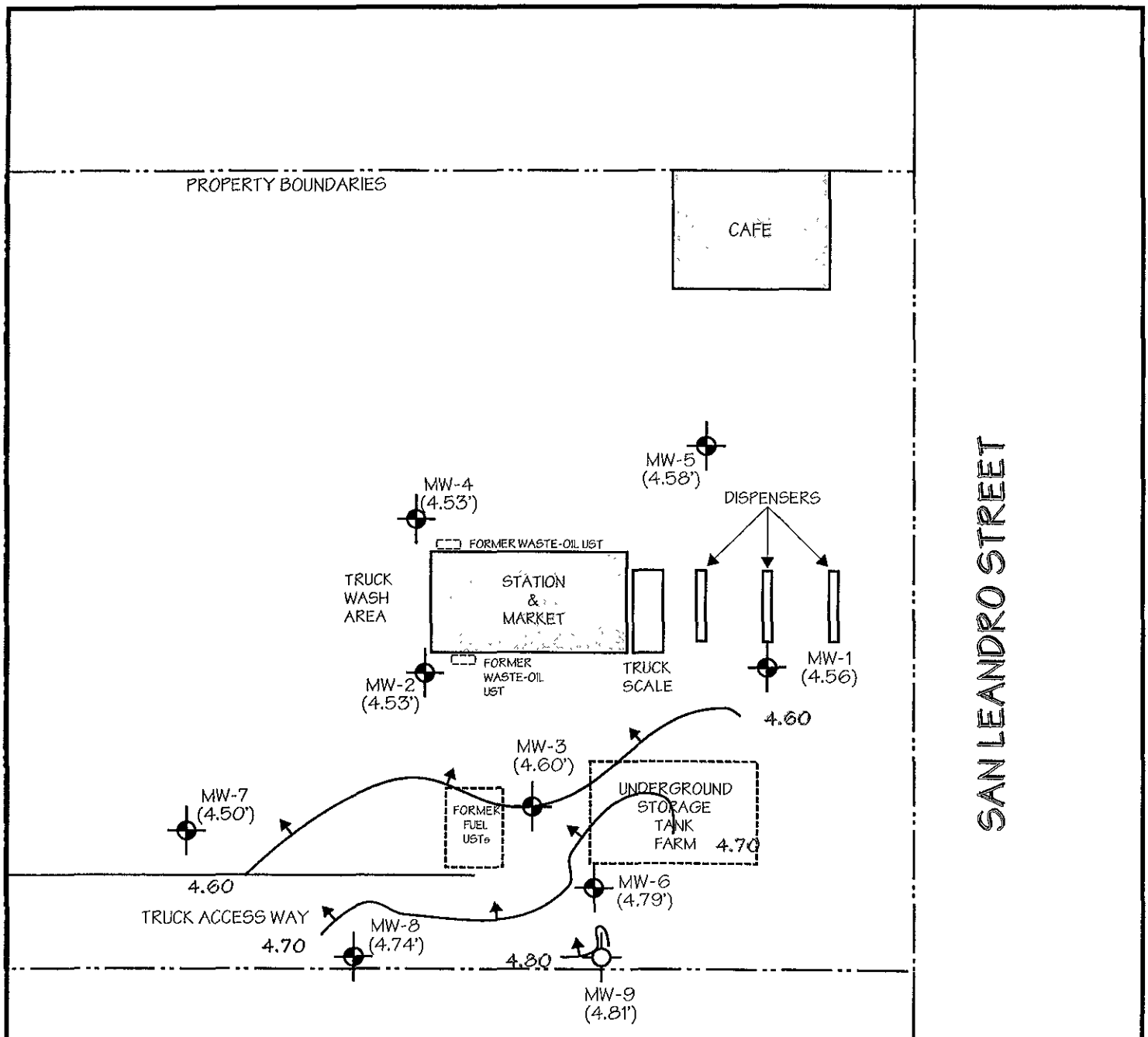


BORING LOCATION MAP

OAKLAND TRUCK STOP
8255 SAN LEANDRO STREET
OAKLAND, CALIFORNIA

AQUA SCIENCE ENGINEERS, INC. | Figure 3


PROPERTY BOUNDARIES
CAFE
MW-5
MW-4
DISPENSERS
BH-H
FORMER WASTE-OIL UST
TRUCK WASH AREA
STATION & MARKET
BH-G
MW-2
FORMER WASTE-OIL UST
TRUCK SCALE
MW-1
SAN LEANDRO STREET
BH-A
MW-3
UNDERGROUND STORAGE TANK FARM
MW-7
FORMER FUEL USTs
BH-B
MW-6
BH-F
TRUCK ACCESS WAY
MW-8
BH-C
BH-D
BH-E
MW-9
LEGEND
Attempted Soil Boring
Newly Installed 4-inch diameter Monitoring well
Newly Installed 2-inch diameter Monitoring Well
MW-4
Monitoring Well
BH-A
Soil Boring
NORTH
SCALE
1" = 50'
BORING AND MONITORING WELL LOCATION MAP
OAKLAND TRUCK STOP
8255 SAN LEANDRO STREET
OAKLAND, CALIFORNIA
AQUA SCIENCE ENGINEERS, INC.
Figure 4



LEGEND

- Potentiometric surface contour with arrow indicating groundwater flow direction
- 4-inch diameter Monitoring well
- MW-4 (4.53') — Monitoring Well with groundwater elevation in feet

NORTH

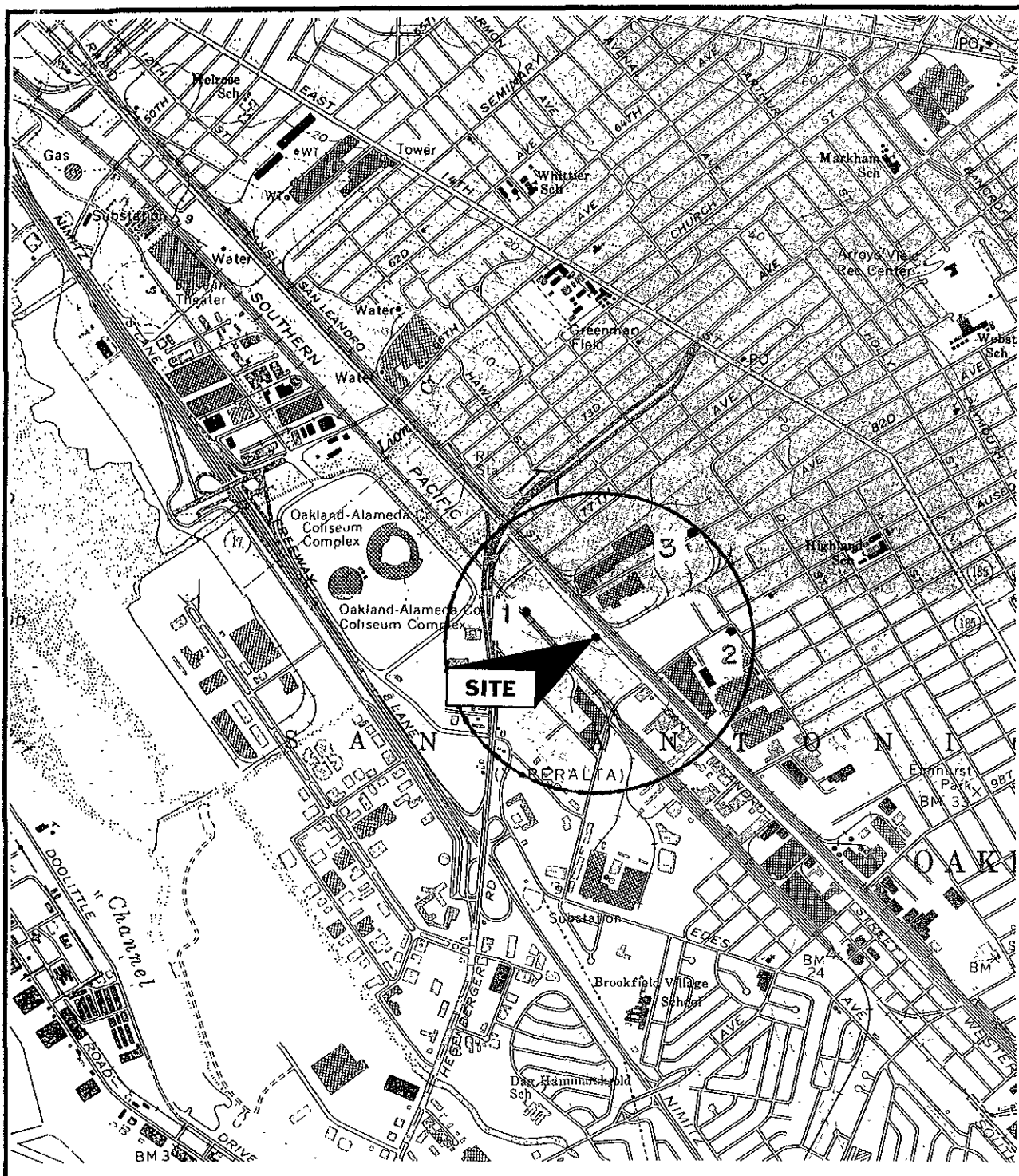
SCALE
1" = 50'

POTENTIOMETRIC SURFACE CONTOUR MAP
9/4/02

OAKLAND TRUCK STOP
8255 SAN LEANDRO STREET
OAKLAND, CALIFORNIA

AQUA SCIENCE ENGINEERS, INC.

Figure 5



Location of Water Wells Within 2,000-Feet of Site

OAKLAND TRUCK STOP
8255 SAN LEANDRO STREET
OAKLAND, CALIFORNIA

AQUA SCIENCE ENGINEERS, INC. | Figure 6

TABLES

TABLE ONE
Groundwater Elevation Data
Oakland Truck Stop
8255 San Leandro Street, Oakland, CA

Well I.D & Date Sampled	Top of Casing Elevation (msl)	Depth to Water (feet)	Free-Floating Hydrocarbon Thickness (feet)	Groundwater Elevation (msl)
MW-4				
8/16/99	96.60	6.12	--	90.48
12/6/99		5.98	--	90.62
3/8/00		4.32	--	92.28
6/14/00		5.58	--	91.02
12/11/00		5.70	--	90.90
3/6/01		4.46	--	92.14
6/6/01		5.89	--	90.71
9/4/01		6.16	--	90.44
3/11/02		4.67	--	91.93
6/6/02		5.50	--	91.10
9/4/02	10.50	5.97	--	4.53
MW-5				
12/6/99	96.30	5.94	--	90.36
3/8/00		4.06	--	92.24
6/14/00		5.25	--	91.05
12/11/00		5.45	--	90.85
3/6/01		4.12	--	92.18
6/6/01		5.56	--	90.74
9/4/01		5.84	--	90.46
3/11/02		4.38	--	91.92
6/6/02		5.16	--	91.14
9/4/02	10.20	5.62	--	4.58
MW-6				
12/6/99	96.79	5.80	--	90.99
3/8/00		4.10	--	92.69
6/14/00		5.64	--	91.15
12/11/00		5.72	--	91.07
3/6/01		4.32	--	92.47
6/6/01		5.81	--	90.98
9/4/01		6.12	--	90.67
3/11/02		4.49	--	92.30
6/6/02		5.33	--	91.46
9/4/02	10.71	5.92	--	4.79
MW-7				
9/4/02	9.17	4.67	--	4.50
MW-8				
9/4/02	9.68	4.94	--	4.74
MW-9				
9/4/02	11.07	6.26	--	4.81

Notes:
* = Groundwater elevation adjusted for the presence of free-floating hydrocarbons by the equation: Adjusted groundwater elevation = Top of of casing elevation - depth to groundwater + (0.8 x free-floating hydrocarbon thickness)

Mid Coast Engineers (MCE) surveyed all site monitoring wells on July 11, 2002 to mean sea level (MSL). The updated elevation data is reflected in the table above.

TABLE ONE
Groundwater Elevation Data
Oakland Truck Stop
8255 San Leandro Street, Oakland, CA

Well I.D & Date Sampled	Top of Casing Elevation (msl)	Depth to Water (feet)	Free-Floating Hydrocarbon Thickness (feet)	Groundwater Elevation (msl)
MW-1				
8/16/99	97.12	Unknown	> 1.0	Unknown
8/27/99		6.90	0.36	90.51*
9/10/99		6.85	0.18	90.41*
9/24/99		6.65	0.08	90.53*
10/8/99		6.87	0.28	90.47*
10/22/99		6.81	0.23	90.49*
11/2/99		6.94	0.31	90.43*
11/19/99		6.91	0.12	90.31*
12/6/99		6.93	0.12	90.29*
3/8/00		5.93	0.21	91.36*
6/14/00		6.57	0.72	90.41*
12/11/00		6.70	0.60	90.90*
3/6/01		5.75	0.40	91.69*
6/6/01		7.60	1.48	90.70*
9/4/01		6.80	0.20	90.48*
3/11/02		approx. 7.47	approx. 3	approx. 92.05*
6/6/02		6.49	0.67	91.17*
9/4/02	**11.02**	**6.89**	**0.54**	**4.56***
MW-2				
8/16/99	96.82	6.30	--	90.52
12/6/99		8.46	--	88.36
3/8/00		9.12	--	87.70
6/14/00		8.34	--	88.48
12/11/00		5.94	--	90.88
3/6/01		4.70	--	92.12
6/6/01		6.03	--	90.79
9/4/01		6.34	--	90.48
3/11/02		4.89	--	91.93
6/6/02		5.69	--	91.13
9/4/02	**10.70**	**6.17**	**--**	**4.53**
MW-3				
8/16/99	96.43	5.85	--	90.58
12/6/99		5.70	--	90.73
3/8/00		5.32	--	91.11
6/14/00		6.95	--	89.48
12/11/00		6.22	--	90.21
3/6/01		4.83	--	91.60
6/6/01		5.62	--	90.81
9/4/01		5.91	--	90.52
3/11/02		4.42	--	92.01
6/6/02		5.19	--	91.24
9/4/02	**10.32**	**5.72**	**--**	**4.60**

TABLE TWO

Summary of Chemical Analysis of GROUNDWATER Samples

Petroleum Hydrocarbons

All results are in parts per billion

Well ID / DATE	TPH Gasoline	TPH Diesel	TPH Motor Oil	Benzene	Toluene	Ethyl Benzene	Total Xylenes	MTBE	DIPE	ETBE	TAME	TBA
MW-1												
8/16/99					Not Sampled Due to Free-Floating Hydrocarbons							
12/6/99					Not Sampled Due to Free-Floating Hydrocarbons							
3/8/00					Not Sampled Due to Free-Floating Hydrocarbons							
6/14/00					Not Sampled Due to Free-Floating Hydrocarbons							
12/11/00					Not Sampled Due to Free-Floating Hydrocarbons							
3/6/01					Not Sampled Due to Free-Floating Hydrocarbons							
6/6/01					Not Sampled Due to Free-Floating Hydrocarbons							
9/4/01					Not Sampled Due to Free-Floating Hydrocarbons							
3/11/02					Not Sampled Due to Free-Floating Hydrocarbons							
6/6/02					Not Sampled Due to Free-Floating Hydrocarbons							
9/4/02					**Not Sampled Due to Free-Floating Hydrocarbons**							
MW-2												
8/16/99	2,200	970*	< 500	3.8	< 2.0	3	< 4.0	< 20	NA	NA	NA	NA
12/6/99	1,900	400*	< 500	16	< 0.5	1.5	< 0.5	5.2	NA	NA	NA	NA
3/8/00	1,600*	530*	< 500	9.7	< 0.5	2.7	< 0.5	27	NA	NA	NA	NA
6/14/00	2,000	75	< 100	2.8	< 0.5	3.4	< 0.5	16	3.4	< 0.5	< 0.5	64
12/11/00	1,000	120	< 100	2.6	< 0.5	< 0.5	< 0.5	15	2.9	< 0.5	< 0.5	62
3/6/01	1,500	1,400	NA	2.2	< 0.5	1.7	< 0.5	22	3.4	<0.5	<0.5	83
6/6/01	1,700	190	NA	2.6	< 0.5	2.3	< 0.5	26	3.2	<0.5	<0.5	83
9/4/01	2,000	450	NA	2.7	< 0.5	2.1	< 0.5	33	3.4	< 0.5	< 0.5	93
3/11/02	1,100	410	NA	1.0	< 0.5	0.5	< 0.5	26	2.5	< 0.5	< 0.5	69
6/6/02	900	430	NA	1.2	< 0.5	< 0.5	< 0.5	23	2.8	< 0.5	< 0.5	73
9/4/02	**910**	**510**	**NA**	**1.6**	**< 0.5**	**< 0.5**	**< 0.5**	**45**	**2.5**	**< 0.5**	**< 0.5**	**67**
MW-3												
8/16/99	56,000	10,000**	< 500	17,000	2,600	2,600	1,200	6,100	NA	NA	NA	NA
12/6/99	40,000	9,100*	< 500	16,000	140	1,800	100	2,200/4,000#	NA	NA	NA	NA
3/8/00	22,000	4,500*	< 500	11,000	72	1,100	130	3,400	NA	NA	NA	NA
6/14/00	34,000	16,000	< 100	13,000	94	1,300	160	4,800	31	< 10	21	2,700
12/11/00	24,000	14,000	< 100	13,000	88	780	120	4,300	< 50	< 50	< 50	2,300
3/6/01	34,000	12,000	NA	15,000	100	1,100	130	4,000	< 50	< 50	< 50	2,100
6/6/01	34,000	20,000	NA	14,000	94	550	110	4,400	< 50	< 50	< 50	2,300
9/4/01	29,000	19,000	NA	13,000	83	480	83	4,100	< 50	< 50	< 50	3,400
3/11/02	12,000	14,000	NA	2,900	< 20	110	< 20	530	< 20	< 20	< 20	330
6/6/02	20,000	14,000	NA	10,000	< 50	200	51	2,400	< 50	< 50	< 50	1,200
9/4/02	**24,000**	**17,000**	**NA**	**11,000**	**< 50**	**140**	**< 50**	**3,200**	**< 50**	**< 50**	**< 50**	**1,400**

TABLE TWO

Summary of Chemical Analysis of GROUNDWATER Samples

Petroleum Hydrocarbons

All results are in parts per billion

Well ID DATE	TPH Gasoline	TPH Diesel	TPH Motor Oil	Benzene	Toluene	Ethyl Benzene	Total Xylenes	MTBE	DIPE	ETBE	TAME	TBA
MW-4												
8/16/99	61***	1,100*	< 500	< 0.5	< 0.5	< 0.5	< 1.0	86	NA	NA	NA	NA
12/6/99	130***	220*	< 500	< 1.0	< 1.0	< 1.0	< 1.0	130	NA	NA	NA	NA
3/8/00	< 50	220*	< 500	< 0.5	< 0.5	< 0.5	< 0.5	130	NA	NA	NA	NA
6/14/00	< 50	< 50	< 100	< 0.5	< 0.5	< 0.5	< 0.5	100	< 0.5	< 0.5	< 0.5	20
12/11/00	< 50	< 50	< 100	< 0.5	< 0.5	< 0.5	< 0.5	110	< 0.5	< 0.5	< 0.5	16
3/6/01	< 50	670	NA	< 0.5	< 0.5	< 0.5	< 0.5	110	< 0.5	< 0.5	< 0.5	9.9
6/6/01	< 50	790	NA	< 0.5	< 0.5	< 0.5	< 0.5	110	< 0.5	< 0.5	< 0.5	20
9/4/01	< 50	950	NA	< 0.5	< 0.5	< 0.5	< 0.5	110	< 0.5	< 0.5	< 0.5	26
3/11/02	< 50	250	NA	< 0.5	< 0.5	< 0.5	< 0.5	84	< 0.5	< 0.5	< 0.5	21
6/6/02	< 50	710	NA	< 0.5	< 0.5	< 0.5	< 0.5	92	< 0.5	< 0.5	< 0.5	21
9/4/02	**< 50**	**1,100**	**NA**	**< 0.5**	**< 0.5**	**< 0.5**	**< 0.5**	**150**	**< 0.5**	**< 0.5**	**< 0.5**	**18**
MW-5												
12/6/99	450***	2,000*	< 500	< 1.0	< 1.0	< 1.0	< 1.0	21	NA	NA	NA	NA
3/8/00	51***	530*	< 500	< 0.5	< 0.5	< 0.5	<0.5	84	NA	NA	NA	NA
6/14/00	380	1,400	< 100	< 0.5	< 0.5	< 0.5	< 0.5	160	12	< 0.5	< 0.5	22
12/11/00	540	590	< 100	< 0.5	< 0.5	< 0.5	< 0.5	240	9.5	< 0.5	< 0.5	32
3/6/01	510	2,900	NA	< 0.5	< 0.5	< 0.5	< 0.5	140	13	< 0.5	< 0.5	19
6/6/01	280	2,700	NA	< 0.5	< 0.5	< 0.5	< 0.5	180	13	< 0.5	< 0.5	26
9/4/01	630	2,600	NA	< 0.5	< 0.5	< 0.5	< 0.5	180	9.4	< 0.5	< 0.5	29
3/11/02	97	3,500	NA	< 0.5	< 0.5	< 0.5	< 0.5	29	0.79	< 0.5	< 0.5	7.4
6/6/02	61	3,500	NA	< 0.5	< 0.5	< 0.5	< 0.5	150	2.9	< 0.5	< 0.5	34
9/4/02	**92**	**6,100**	**NA**	**< 0.5**	**< 0.5**	**< 0.5**	**< 0.5**	**370**	**3.6**	**< 0.5**	**< 0.5**	**72**
MW-6												
~~12/6/99~~	13,000	< 50	< 500	180	21	11	24	< 100	NA	NA	NA	NA
3/8/00	< 10,000	4,600*	< 500	230	26	18	39	12,000	NA	NA	NA	NA
6/14/00	8,400	12,000	< 100	190	12	9.5	22	15,000	< 5.0	< 5.0	70	3,300
12/11/00	< 5,000	10,000	< 100	190	< 50	< 50	< 50	14,000	< 50	< 50	74	2,900
3/6/01	5,300	6,700	NA	220	< 50	< 50	< 50	13,000	< 50	< 50	84	2,100
6/6/01	5,000	23,000	NA	210	< 25	< 25	< 25	12,000	< 25	< 25	84	4,200
9/4/01	5,400	22,000	NA	190	12	< 10	23	15,000	< 10	< 10	79	4,000
3/11/02	4,600	11,000	NA	160	< 25	< 25	< 25	15,000	< 25	< 25	39	5,100
6/6/02	< 5,000	14,000	NA	200	< 50	< 50	< 50	17,000	< 50	< 50	77	8,700
9/4/02	**< 5,000**	**50,000**	**NA**	**140**	**< 50**	**< 50**	**< 50**	**21,000**	**< 50**	**< 50**	**52**	**7,500**
MW-7												
9/4/02	< 50	130****	NA	< 0.5	< 0.5	< 0.5	< 0.5	3.4	< 0.5	< 0.5	< 0.5	< 5.0
MW-8												
9/4/02	< 50	170	NA	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 5.0

TABLE TWO

Summary of Chemical Analysis of GROUNDWATER Samples

Petroleum Hydrocarbons

All results are in parts per billion

Well ID DATE	TPH Gasoline	TPH Diesel	TPH Motor Oil	Benzene	Toluene	Ethyl Benzene	Total Xylenes	MTBE	DIPE	ETBE	TAME	TBA
MW-9 9/4/02	< 2,500	1,000	NA	< 25	< 25	< 25	< 25	12,000	< 25	< 25	70	1,700
DHS MCL	NE	NE	NE	1	150	700	1,750	13	NE	NE	NE	NE
RBSL	400	500	500	46	130	290	1	1,800	NE	NE	NE	NE

Notes:

Non-detectable concentrations are noted by the less than symbol (<) followed by the detection limit.

Most recent concentrations are in bold.

DHS MCL is the California Department of Health Services maximum contaminant level for drinking water.

RBSL is the RWQCB Risk-Based Screening Level where groundwater is not a potential source of drinking water.

NE = MCL/RBSL not established.

NA = Sample not analyzed for this compound.

* = Non-typical diesel pattern, hydrocarbons in early diesel range.

** = Estimated concentration due to overlapping fuel patterns in the sample.

*** = Non-typical gasoline pattern.

**** = Non-typical diesel pattern.

= MTBE concentration by EPA Method 8260

TABLE THREE

Summary of Analysis of **SOIL** Samples
TPH-G, TPH-D, BTEX
All results are in **parts per million**

Boring	Depth (Feet)	TPH Gasoline	TPH Diesel	TPH Motor Oil	Benzene	Toluene	Ethyl Benzene	Total Xylenes
BH-A	7.5'	**370**	**670**	< 200	**2.3**	**0.16**	**4.7**	**1.1**
	11.5'	**210**	**130**	< 10	**1.3**	**0.52**	**3.7**	**15**
BH-B	7.5'	**4.4**	**2.5**	**24**	**0.040**	< 0.0050	< 0.0050	< 0.0050
	11.5'	**190**	**120**	< 10	**0.048**	**0.030**	**0.37**	**0.020**
BH-C	11.5'	< 1.0	< 1.0	< 10	< 0.0050	< 0.0050	< 0.0050	< 0.0050
BH-D	11.5'	< 1.0	< 1.0	< 10	< 0.0050	< 0.0050	< 0.0050	< 0.0050
BH-E	11.5'	< 1.0	< 1.0	**14**	< 0.0050	< 0.0050	< 0.0050	< 0.0050
BH-F	11.5'	< 1.0	< 1.0	< 10	< 0.0050	< 0.0050	< 0.0050	< 0.0050
BH-G	12'	**270**	**1,500**	< 10	< 0.020	**0.028**	< 0.020	< 0.020
BH-H	8'	**150**	**1,100**	< 10	**0.029**	**0.024**	< 0.020	< 0.020
	12'	**3.0**	**320**	< 10	< 0.0050	< 0.0050	< 0.0050	< 0.0050
MW-7	10.5'	< 1.0	< 1.0	< 10	< 0.0050	< 0.0050	< 0.0050	< 0.0050
MW-8	11.0'	< 1.0	**3.9**	< 10	< 0.0050	< 0.0050	< 0.0050	< 0.0050
MW-9	13.0'	< 1.0	< 1.0	**15**	< 0.0050	< 0.0050	< 0.0050	< 0.0050
RBSL		400	500	500	0.39	8.4	24	1.0

Notes:
Non-detectable concentrations are noted by the less than symbol (<) followed by the detection limit.

Detectable concentrations are in **bold**.

RBSL is the California Regional Water Quality Control Board, San Francisco Bay Region Risk-Based Screening Level for subsurface soil at commercial/industrial property where groundwater is not a current or potential source of drinking water.

TABLE FOUR
Summary of Analysis of **SOIL** Samples
Oxygenates
All results are in **parts per million**

Boring	Depth (Feet)	MTBE	DIPE	ETBE	TAME	TBA
BH-A	7.5'	< 0.050	< 0.050	< 0.050	< 0.050	< 0.50
	11.5'	< 0.020	< 0.020	< 0.020	< 0.020	< 0.20
BH-B	7.5'	< 0.0050	< 0.0050	< 0.0050	< 0.0050	**0.012**
	11.5'	**0.41**	< 0.020	< 0.020	< 0.020	< 0.20
BH-C	11.5'	**1.0**	< 0.0050	< 0.0050	**0.025**	**0.49**
BH-D	11.5'	**1.7**	< 0.0050	< 0.0050	**0.024**	**0.57**
BH-E	11.5	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050
BH-F	11.5'	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050
BH-G	12'	**0.050**	< 0.020	< 0.020	< 0.020	< 0.20
BH-H	8'	**0.060**	< 0.020	< 0.020	< 0.020	< 0.20
	12'	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.020
MW-7	10.5'	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050
MW-8	11.0'	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050
MW-9	13.0'	**0.0058**	< 0.0050	< 0.0050	< 0.0050	**0.0051**
RBSL		1.0	NE	NE	NE	NE

Notes:

Non-detectable concentrations are noted by the less than symbol (<) followed by the detection limit.

Detectable concentrations are in **bold**.

RBSL is the California Regional Water Quality Control Board, San Francisco Bay Region Risk-Based Screening Level for subsurface soil at commercial/industrial property where groundwater is not a current or potential source of drinking water.

NE = RBSL is not established.

TABLE FIVE

Summary of Analysis of **WATER** Samples
TPH-G, TPH-D, BTEX
All results are in **parts per billion**

Boring	TPH Gasoline	TPH Diesel	TPH Motor Oil	Benzene	Toluene	Ethyl Benzene	Total Xylenes
BH-A	**43,000**	**8,700**	< 100	**4,000**	**400**	**2,200**	**3,100**
BH-B	**51,000**	**120,000**	< 2,000	**430**	< 10	**700**	**19**
BH-C	< 200	**200**	**890**	< 2.0	< 2.0	< 2.0	< 2.0
BH-D	< 500	< 50	**2,400**	< 5.0	< 5.0	< 5.0	< 5.0
BH-E	< 50	< 50	**11,000**	< 0.50	< 0.50	< 0.50	< 0.50
BH-F	< 50	< 50	**780**	< 0.50	< 0.50	< 0.50	< 0.50
BH-G	**120,000**	**2,200,000**	< 1,000	< 50	< 50	< 50	< 50
BH-H	< 50	**1,400**	**1,400**	< 0.50	< 0.50	< 0.50	< 0.50
MCL		NE	NE	1.0	150	700	1,750

Notes:

Non-detectable concentrations are noted by the less than symbol (<) followed by the detection limit.

Detectable concentrations are in **bold**.

MCL is the California Department of Health Services maximum contaminant level for drinking water.

NE = No MCL is established.

TABLE SIX

Summary of Analysis of **WATER** Samples

Oxygenates

All results are in **parts per billion**

Boring	MTBE	DIPE	ETBE	TAME	TBA
BH-A	**46**	< 20	< 20	< 20	< 200
BH-B	**6,200**	< 10	< 10	**37**	**1,000**
BH-C	**13,000**	< 2.0	< 2.0	**100**	**2,600**
BH-D	**42,000**	< 5.0	< 5.0	**250**	**6,800**
BH-E	**6.0**	< 0.50	< 0.50	< 0.50	< 5.0
BH-F	< 0.50	< 0.50	< 0.50	< 0.50	< 5.0
BH-G	**170**	< 50	< 50	< 50	< 500
BH-H	< 0.50	< 0.50	< 0.50	< 0.50	< 5.0
PRG	13	NE	NE	NE	NE

Notes:

Non-detectable concentrations are noted by the less than symbol (<) followed by the detection limit.

Detectable concentrations are in **bold**.

MCL is the California Department of Health Services maximum contaminant level for drinking water.

NE = No MCL is established.

TABLE SEVEN

Wells Located Within 2,000-Foot Radius of 8255 San Leandro Street, Oakland, California

Well Number	Well Address or Location	Well Owner and Address	Well Type	Year Drilled
1	Approx 250 yards west of San Leandro St and 100 yards north of 81st St, adjacent to SPRR tracks	American Brass & Iron Foundry 7825 San Leandro Street Oakland, CA	Industrial	1977
2	8609 G Street	Lucchesi 8609 G Street Oakland, CA	Irrigation, status unknown	Unknown
3	1001 81st Avenue	A.R. Compaglia 1001 81st Avenue Oakland, CA	Irrigation, status unknown	1941

APPENDIX A

Letters from the ACHCSA

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

ENVIRONMENTAL HEALTH SERVICES
ENVIRONMENTAL PROTECTION
1131 Harbor Bay Parkway, Suite 250
Alameda, CA 94502-6577
(510) 567-6700
FAX (510) 337-9335

February 22, 2001
StID # 559

Mr. Nissan Saidian
5733 Medallion Court
Castro Valley, CA 94522

Re: Work Plan for Additional Soil and Groundwater Assessment at 8255 San Leandro St., Oakland CA 94621

Dear Mr. Saidian:

Our office has received and reviewed the February 6, 2001 work plan for the above referenced site prepared by Aqua Science Engineers Inc. (ASE), your consultant. The work plan responds to my July 27, 2000 letter and proposes the following:

- Investigate the extent of the groundwater contamination plume by installing three additional monitoring wells in the southwest direction from the former tanks and advancing one off-site boring northeast of the existing dispenser islands.
- One of the new monitoring wells will be 4" diameter and will be used to perform a step draw-down and constant rate pump test to determine the viability of groundwater extraction.
- After the installation of these wells, all monitoring wells at the site will be sampled and monitored. The additional wells will aid in confirming the groundwater gradient at the site, which has been unusual.
- Should free product be encountered in any well, a sample will be collected, analyzed and characterized. This will help determine if there have been recent releases in additional to older releases.
- A receptor survey will be performed to identify potential impacts from the fuel release.

This work plan is approved with the condition that the final report should also include a Tier 1 Human Health Risk Assessment (HRA). The HRA should also include an evaluation of risk to MTBE.

You may contact me at (510) 567-6765 if you have any questions.

Sincerely,

Barney M. Chan

Barney M. Chan
Hazardous Materials Specialist

C: B. Chan, files
Mr. Robert Kitay, Aqua Science Engineers, 208 W. El Pintado, Danville, CA 94526

Wpap8255SLSt

APPENDIX B

Permits

CITY OF OAKLAND
Office of Planning and Building

EXCAVATION PERMIT

TO EXCAVATE IN STREETS OR OTHER SPECIFIED WORK

CIVIL ENGINEERIN

PERMIT NUMBER	SITE ADDRESS/LOCATION
X0200659	8255 San Leandro Street
APPROX. START DATE: 7-8-02 / APPROX. END DATE: 7-8-02	24-HOUR EMERGENCY PHONE NUMBER (Permit not valid without 24-Hour number): 925-820-9391
CONTRACTOR'S LICENSE # AND CLASS: 487000 C-57, A, Haz	CITY BUSINESS TAX #

ATTENTION:

1- State law requires that the contractor/owner call Underground Service Alert (USA) two working days before excavating. This permit is not valid unless applicant has secured an inquiry identification number issued by USA. The USA telephone number is 1-800-642-2444. Underground Service Alert (USA) # _____

2- **48 hours prior to starting work, you MUST CALL (510) 238-3651 to schedule an inspection.**

3- **48 hours prior to re-paving, a compaction certificate is required (waived for approved slurry backfill).**

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 its 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 an 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. 7044, Business 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 on 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 _____

WORKER'S COMPENSATION

☐ I hereby affirm that I have a certificate of consent to self-insure, or a certificate of Worker's Compensation Insurance, or a certified copy thereof (Sec. 3700, Labor Code).

Policy # _____ Company Name _____

☐ 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 Worker's Compensation Laws of California (not required for work valued at one hundred dollars ($100) or less).

NOTICE TO APPLICANT: If, after making this Certificate of Exemption, you should become subject to the Worker's Compensation provisions of the Labor Code, you must forthwith comply with such provisions or this permit shall be deemed revoked. This permit is issued pursuant to all provisions of Title 12 Chapter 12.12 of the Oakland Municipal Code. It 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. This permit is void 90 days from the date of issuance unless an extension is granted by the Director of the Office of Planning and Building.

I hereby affirm that I am licensed under provisions of Chapter 9 of Division 3 of the Business and Professions Code and my license is in full force and effect (if contractor), that I have read this permit and agree to its requirements, and that the above information is true and correct under penalty of law.

Signature of Permittee Richard C. Kutay ☐ Agent for ☐ Contractor ☐ Owner — Date 6-28-02

DATE STREET LAST RESURFACED	SPECIAL PAVING DETAIL REQUIRED? ☐ YES ☐ NO	HOLIDAY RESTRICTION? (NOV 1 - JAN 1) ☐ YES ☐ NO	LIMITED OPERATION AREA? (7AM-9AM & 4PM-6PM) ☐ YES ☐ NO
ISSUED BY		DATE ISSUED 6-28-02	

CITY OF OAKLAND • Community and Economic Development Agency
250 Frank H. Ogawa Plaza, 2nd Floor, Oakland, CA 94612 • Phone (510) 238-3443 • FAX (510) 238-2263

Job Site 8255 SAN LEANDRO ST Parcel# 041 -4208-002-00 Appl# X0200659

Descr DRILLING FOR SOIL SAMPLING ADJACENT TO ABOVE ADDRESS Filed 06/28/02

Work Type EXCAVATION-PRIVATE P

USA # Util Co. Job # Acctg#:
Util Fund #:

		Applcnt	Phone#	Lic#	--License Classes--
Owner	SAIDIAN NISSAN & CAROL M TRS				
Contractor	AQUA SCIENCE ENGINEERS, INC.	X	(925)820-9391	487000 A	C57
Arch/Engr					
Agent					

Applic Addr 208 WEST EL PINTADO, DANVILLE, CA., 94526

$250.00 TOTAL FEES PAID AT ISSUANCE

$45.00 Applic	$205.00 Permit
$.00 Process	$.00 Rec Mgmt
$.00 Gen Plan	$.00 Invstg
$.00 Other	

ADDRESS: _____

DIST: _____

Date: 06/28/02 Amt Paid: 250.00
By: ESL Register R02 Receipt# 040102

ALAMEDA COUNTY PUBLIC WORKS AGENCY

WATER RESOURCES SECTION
399 ELMHURST ST. HAYWARD CA 94544-1395
PHONE (510) 670-6633 James Yoo
FAX (510)782-1939

APPLICANTS: PLEASE ATTACH A SITE MAP FOR ALL DRILLING PERMIT APPLICATIONS
DESTRUCTION OF WELLS OVER 45 FEET REQUIRES A SEPARATE PERMIT APPLICATION

DRILLING PERMIT APPLICATION

FOR APPLICANT TO COMPLETE

LOCATION OF PROJECT Oakland Truck Stop
9255 San Leandro Street
Oakland, CA

CLIENT
Name Nissan Saidian
Address 5253 Mediation Ct Phone
City Castro Valley, CA Zip 94552

APPLICANT
Name Aqua Science Engineers Fax 925-837-4853
Attn: Robert Kitay Phone 925-820-9391
Address 208 G St. Suite 20
City Penryn, CA Zip 95626

TYPE OF PROJECT

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

PROPOSED WATER SUPPLY WELL USE

New Domestic	( )	Replacement Domestic	( )
Municipal	( )	Irrigation	( )
Industrial	( )	Other	( )

DRILLING METHOD:

Mud Rotary	( )	Air Rotary	( )	Auger	(X)
Cable	( )	Other	( )		

DRILLER'S NAME Gregg Drilling
DRILLER'S LICENSE NO. C-57 485165

WELL PROJECTS
Drill Hole Diameter 8 in. Maximum
Casing Diameter 2 in. Depth 20 ft.
Surface Seal Depth 5 ft. Owner's Well Number MW-7

GEOTECHNICAL PROJECTS
Number of Borings
Hole Diameter in. Maximum
Depth ft.

ESTIMATED STARTING DATE 7-8-02
ESTIMATED COMPLETION DATE 7-9-02

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

APPLICANT'S SIGNATURE Robert E. Kitay DATE 7-3-02
PLEASE PRINT NAME Robert E. Kitay

Rev 3-04-02

FOR OFFICE USE
PERMIT NUMBER W02-0666
WELL NUMBER
APN

PERMIT CONDITIONS
Circled Permit Requirements Apply

A. GENERAL
1. A permit application should be submitted so as to arrive at the ACPWA office five days prior to proposed starting date.
2. Submit to ACPWA within 60 days after completion of permitted original Department of Water Resources-Well Completion Report.
3. Permit is void if project not begun within 90 days of approval date.

B. WATER SUPPLY WELLS
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.

C. GROUNDWATER MONITORING WELLS INCLUDING PIEZOMETERS
1. Minimum surface seal thickness is two inches of cement grout placed by tremie.
2. Minimum seal depth for monitoring wells is the maximum depth practicable or 20 feet.

D. GEOTECHNICAL
Backfill bore hole by tremie with cement grout or cement grout/sand mixture. Upper two-three feet replaced in kind or with compacted cuttings.

E. CATHODIC
Fill hole above zone with concrete placed by tremie.

F. WELL DESTRUCTION
Send a map of work site. A separate permit is required for wells deeper than 45 feet.

G. SPECIAL CONDITIONS

NOTE: One application must be submitted for each well or well destruction. Multiple borings on one application are acceptable for geotechnical and contamination investigations.

APPROVED DATE 7-5-02

ALAMEDA COUNTY PUBLIC WORKS AGENCY

WATER RESOURCES SECTION
399 ELMHURST ST. HAYWARD CA. 94544-1395
PHONE (510) 670-6633 James Yoo
FAX (510)782-1939

APPLICANTS: PLEASE ATTACH A SITE MAP FOR ALL DRILLING PERMIT APPLICATIONS
DESTRUCTION OF WELLS OVER 45 FEET REQUIRES A SEPARATE PERMIT APPLICATION

DRILLING PERMIT APPLICATION

FOR APPLICANT TO COMPLETE

LOCATION OF PROJECT Oakland Truck Stop
9255 San Leandro Street
Oakland, CA

CLIENT
Name Alisan Saidam
Address 5733 Medallion Ct Phone
City Castro Valley, CA Zip 94552

APPLICANT
Name Aqua Science Engineers Fax 925-837-4853
Address 208 W. El Pintado Phone 925-820-7391
City Danville, CA Zip 94526

TYPE OF PROJECT

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

PROPOSED WATER SUPPLY WELL USE

New Domestic		Replacement Domestic	
Municipal		Irrigation	
Industrial		Other	

DRILLING METHOD:

Mud Rotary		Air Rotary		Auger	X
Cable		Other			

DRILLER'S NAME: Gregg Drilling
DRILLER'S LICENSE NO. C-57 485165

WELL PROJECTS
Drill Hole Diameter 8 in. Maximum Depth 20 ft.
Casing Diameter 2 in.
Surface Seal Depth 5 ft. Owner's Well Number MW-8

GEOTECHNICAL PROJECTS
Number of Borings Maximum Depth
Hole Diameter in. Depth ft.

ESTIMATED STARTING DATE 7-8-02
ESTIMATED COMPLETION DATE 7-9-02

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

APPLICANT'S SIGNATURE Robert E. Kitay DATE 7-3-02
PLEASE PRINT NAME Robert E. Kitay

Rev 3-04-02

FOR OFFICE USE
PERMIT NUMBER W02-0667
WELL NUMBER
APN

PERMIT CONDITIONS
Circled Permit Requirements Apply

A. GENERAL
1. A permit application should be submitted so as to arrive at the ACPWA office five days prior to proposed starting date.
2. Submit to ACPWA within 60 days after completion of permitted original Department of Water Resources Well Completion Report.
3. Permit is void if project not begun within 90 days of approval date.

B. WATER SUPPLY WELLS
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.

C. GROUNDWATER MONITORING WELLS INCLUDING PIEZOMETERS
1. Minimum surface seal thickness is two inches of cement grout placed by tremie.
2. Minimum seal depth for monitoring wells is the maximum depth practicable or 20 feet.

D. GEOTECHNICAL
Backfill bore hole by tremie with cement grout or cement grout/sand mixture. Upper two-three feet replaced in kind or with compacted cuttings.

E. CATHODIC
Fill hole inside zone with concrete placed by tremie.

F. WELL DESTRUCTION
Send a map of work site. A separate permit is required for wells deeper than 45 feet.

G. SPECIAL CONDITIONS

NOTE: One application must be submitted for each well or well destruction. Multiple borings on one application are acceptable for geotechnical and contamination investigations.

APPROVED DATE 7-5-02

ALAMEDA COUNTY PUBLIC WORKS AGENCY

WATER RESOURCES SECTION
399 ELMHURST ST. HAYWARD CA. 94544-1395
PHONE (510) 670-6633 James Yoo
FAX (510)782-1939
APPLICANTS: PLEASE ATTACH A SITE MAP FOR ALL DRILLING PERMIT APPLICATIONS
DESTRUCTION OF WELLS OVER 45 FEET REQUIRES A SEPARATE PERMIT APPLICATION

DRILLING PERMIT APPLICATION

FOR APPLICANT TO COMPLETE

LOCATION OF PROJECT Oakland Truck Stop
8255 San Leandro Street
Oakland, CA

CLIENT
Name Alissa Saidian
Address 5233 Mediation Ct. Phone
City Castro Valley, CA. Zip 94552

APPLICANT
Name Aqua Science Engineers Fax 925-837-4853
Attn: Robert Kitay Phone 925-820-9391
Address 347 W. Bay Ave.
City Pleasanton, CA Zip 94566

TYPE OF PROJECT

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

PROPOSED WATER SUPPLY WELL USE

New Domestic		Replacement Domestic	
Municipal		Irrigation	
Industrial		Other	

DRILLING METHOD:

Mud Rotary		Air Rotary		Auger	X
Cable		Other			

DRILLER'S NAME Gregg Drilling
DRILLER'S LICENSE NO C-57 485165

WELL PROJECTS
Drill Hole Diameter 10 in. Maximum Depth 20 ft.
Casing Diameter 4 in.
Surface Seal Depth 5 ft. Owner's Well Number EW-1

GEOTECHNICAL PROJECTS
Number of Borings
Hole Diameter in. Maximum Depth ft.

ESTIMATED STARTING DATE 7-8-02
ESTIMATED COMPLETION DATE 7-12-02

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

APPLICANT'S SIGNATURE Robert E. Kitay DATE 7-3-02
PLEASE PRINT NAME Robert E. Kitay

Rev 3-04-02

FOR OFFICE USE
PERMIT NUMBER W02-0668
WELL NUMBER
APN

PERMIT CONDITIONS
Circled Permit Requirements Apply

A. GENERAL
1. A permit application should be submitted so as to arrive at the ACPWA office five days prior to proposed starting date.
2. Submit to ACPWA within 60 days after completion of permitted original Department of Water Resources-Well Completion Report.
3. Permit is void if project not begun within 90 days of approval date.

B. WATER SUPPLY WELLS
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.

C. GROUNDWATER MONITORING WELLS INCLUDING PIEZOMETERS
1. Minimum surface seal thickness is two inches of cement grout placed by tremie.
2. Minimum seal depth for monitoring wells is the maximum depth practicable or 20 feet.

D. GEOTECHNICAL
Backfill bore hole by tremie with cement grout or cement grout/sand mixture. Upper two-three feet replaced in kind or with compacted cuttings.

E. CATHODIC
Fill hole inside zone with concrete placed by tremie.

F. WELL DESTRUCTION
Send a map of work site. A separate permit is required for wells deeper than 45 feet.

G. SPECIAL CONDITIONS

NOTE: One application must be submitted for each well or well destruction. Multiple borings on one application are acceptable for geotechnical and contamination investigations.

APPROVED [signature] DATE 7-5-02

ALAMEDA COUNTY PUBLIC WORKS AGENCY

WATER RESOURCES SECTION
399 ELMHURST ST. HAYWARD CA. 94544-1395
PHONE (510) 670-6633 James Yoo
FAX (510)782-1939
APPLICANTS: PLEASE ATTACH A SITE MAP FOR ALL DRILLING PERMIT APPLICATIONS
DESTRUCTION OF WELLS OVER 45 FEET REQUIRES A SEPARATE PERMIT APPLICATION

DRILLING PERMIT APPLICATION

FOR APPLICANT TO COMPLETE

LOCATION OF PROJECT Oakland Truck Shop
8255 San Leandro Street
Oakland, CA

CLIENT
Name Nissan Saidian
Address 5233 Mediterranean Ct Phone
City Concord Valley CA Zip 94522

APPLICANT
Name Lawa Science Engineers Fax 925-837-4853
Attn Robert Kitay Phone 925-820-7391
Address 208 Commercial St. Suite A
City Danville CA Zip 94526

TYPE OF PROJECT
Well Construction
Cathodic Protection ( )
Water Supply ( )
Monitoring ( )
Geotechnical Investigation
General ( )
Contamination (X)
Well Destruction ( )

PROPOSED WATER SUPPLY WELL USE
New Domestic ( ) Replacement Domestic ( )
Municipal ( ) Irrigation ( )
Industrial ( ) Other ( )

DRILLING METHOD:
Mud Rotary ( ) Air Rotary ( ) Auger (X) Geoprobe
Cable ( ) Other

DRILLER'S NAME Gregg Drilling
DRILLER'S LICENSE NO C-57 485165

WELL PROJECTS
Drill Hole Diameter ____ in. Maximum Depth ____ ft
Casing Diameter ____ in.
Surface Seal Depth ____ ft Owner's Well Number ____

GEOTECHNICAL PROJECTS
Number of Borings 1 Maximum Depth 16 ft
Hole Diameter 2 in.

ESTIMATED STARTING DATE 7-8-02
ESTIMATED COMPLETION DATE 7-9-02

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

APPLICANT'S SIGNATURE Robert E. Kitay DATE 7-3-02
PLEASE PRINT NAME Robert E. Kitay

Rev 3-04-02

FOR OFFICE USE
PERMIT NUMBER W02-0669
WELL NUMBER
APN

PERMIT CONDITIONS
Circled Permit Requirements Apply

A. GENERAL
1. A permit application should be submitted so as to arrive at the ACPWA office five days prior to proposed starting date.
2. Submit to ACPWA within 60 days after completion of permitted original Department of Water Resources Well Completion Report.
3. Permit is void if project not begun within 90 days of approval date

B. WATER SUPPLY WELLS
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.

C. GROUNDWATER MONITORING WELLS INCLUDING PIEZOMETERS
1. Minimum surface seal thickness is two inches of cement grout placed by tremie.
2. Minimum seal depth for monitoring wells is the maximum depth practicable or 20 feet.

D. GEOTECHNICAL
Backfill bore hole by tremie with cement grout or cement grout/sand mixture. Upper two-three feet replaced in kind or with compacted cuttings.

E. CATHODIC
Fill hole above zone with concrete placed by tremie.

F. WELL DESTRUCTION
Send a map of work site. A separate permit is required for wells deeper than 45 feet

G. SPECIAL CONDITIONS - SC #3 Attached.

NOTE: One application must be submitted for each well or well destruction. Multiple borings on one application are acceptable for geotechnical and contamination investigations

APPROVED [signature] DATE 7-3-02

ALAMEDA COUNTY PUBLIC WORKS AGENCY

WATER RESOURCES SECTION
399 ELMHURST ST. HAYWARD, CA. 94544-1395
PHONE (510) 670-6633 James Yoo FAX (510) 782-1939

PERMIT NO. W02-0669

WATER RESOURCES SECTION
GROUNDWATER PROTECTION ORDINANCE

G. SPECIAL CONDITIONS #3

PLACEMENT OF GEOTECHNICAL BOREHOLES AND CONTAMINATION INVESTIGATIONS IN PUBLIC RIGHT-OF-WAY

1. Prior to any drilling activities into any public right-of-ways, it shall be the applicants responsibilities to contact and coordinate a Underground Service Alert (USA), obtain encroachment permit(s), excavation permits(s) or any other permits required for that Federal, State, County or to the City and follow all City or County Ordinances. It shall also be the applicants responsibilities to provide to the Cities or to Alameda County a Traffic Safety Plan for any lane closures or detours planned. No work shall begin until all the permits and requirements have been approved or obtained.

2. Boreholes in the Public right-of-way shall not be left open for a period of more than 24 hours. All boreholes left open more than 24 hours will need approval from Alameda County Public Works Agency, Water Resources Section. All boreholes shall be backfilled according to permit destruction requirements and all concrete material and asphalt material shall be to Caltrans Spec or County/City Codes. No borehole(s) shall be left in a manner to act as a conduit at any time.

3. Drilling Permit(s) can be voided/ canceled only in writing. It is the applicants responsibilities to notify Alameda County Public Works Agency, Water Resources Section in writing for an extension or to cancel the drilling permit application. No drilling permit application(s) shall be extended beyond ninety (90) days from the original start date. Applicants may not cancel a drilling permit application after the completion date of the permit issued has passed.

4. Compliance with the above well-sealing specifications shall not exempt the well-sealing contractor from complying with appropriate state reporting-requirements related to well destruction (Sections 13750 through 13755 (Division 7, Chapter 10, Article 3) of the California Water Code). Contractor must complete State DWR Form 188 and mail original to the Alameda County Public Works Agency, Water Resources Section, within 60 days.

5. Permittee shall assume entire responsibility for all activities and uses under this permit and shall indemnify, defend and save the Alameda County Public Works Agency, its officers, agents, and employees free and harmless from any and all expense, cost, liability in connection with or resulting from the exercise of this Permit including, but not limited to, property damage, personal injury and wrongful death.

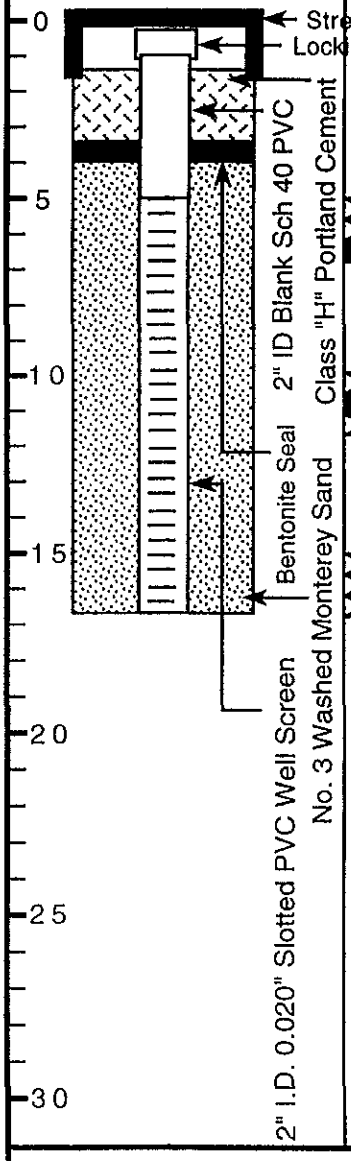
APPENDIX C

Boring Logs
And
Well Construction Details

SOIL BORING LOG AND MONITORING WELL COMPLETION DETAILS		Well MW-7
Project Name: Oakland Truck Stop	Project Location: 8225 San Leandro Street, Oakland, CA	Page 1 of 1
Driller: Gregg Drilling	Type of Rig: Hollow-Stem Auger	Size of Drill: 8.0" Diameter
Logged By: Robert E. Kitay, R.G.	Date Drilled: July 8, 2002	Checked By: Robert E. Kitay, R.G.

WATER AND WELL DATA

Depth of Water First Encountered: 11'	Total Depth of Well Completed: 16.5'
Static Depth of Water in Boring:	Well Screen Type and Diameter: 2" Diameter PVC Casing
Total Depth of Boring: 16.5'	Well Screen Slot Size: 0.020"
	Type and Size of Soil Sampler: 2.0" I.D. Split-Barrel Sampler



SOIL/ROCK SAMPLE DATA

Interval	Blow Counts	OVM (ppmv)	Water Level	Graphic Log
		0	▽	
		0	▼	

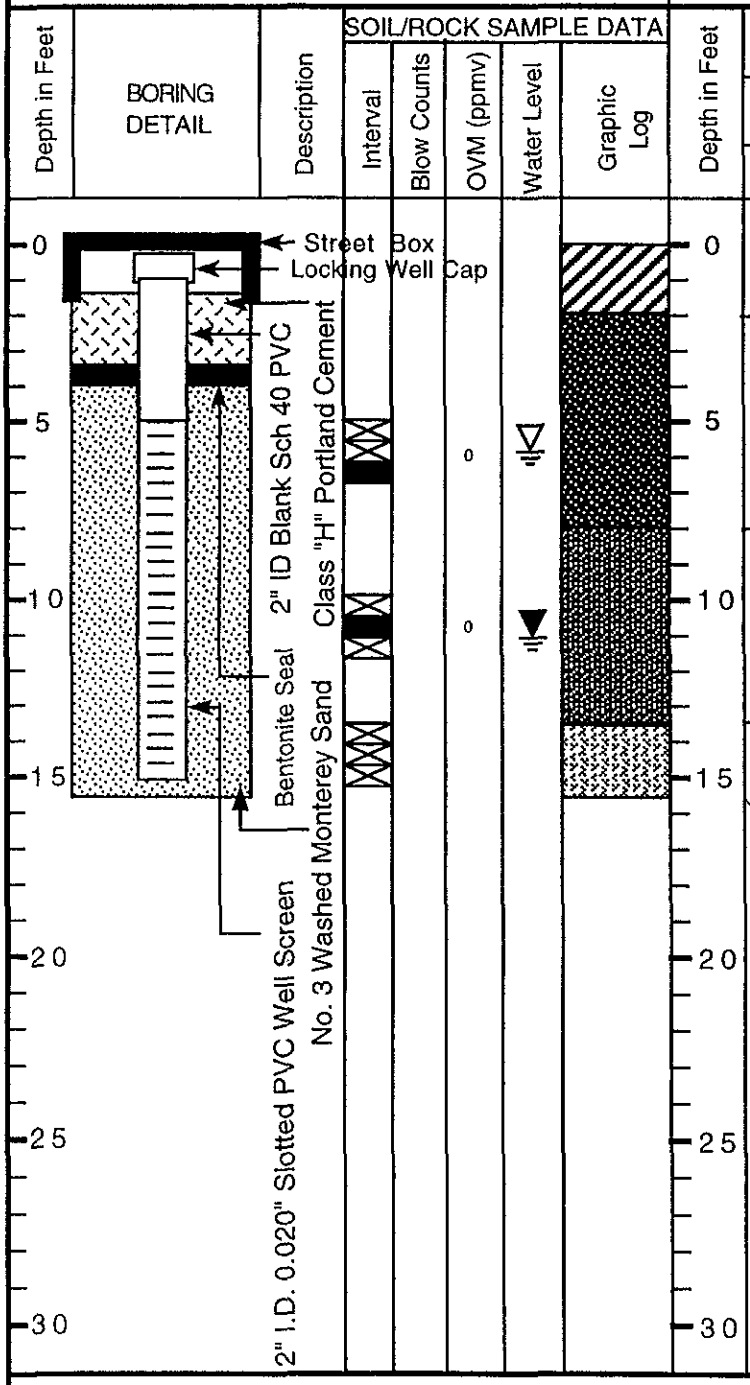
Depth in Feet	DESCRIPTION OF LITHOLOGY standard classification, texture, relative moisture, density, stiffness, odor-staining, USCS designation.
0	Asphaltic Concrete
	Silty CLAY (CH); black; stiff; dry; 70% clay; 30% silt; high plasticity; very low estimated K; no odor
10	Clayey SILT (MH); olive; medium stiff; moist; 80% silt; 20% clay; high plasticity; low estimated K; no odor wet at 11'
15	Silty SAND (SM); grey; loose; wet; 80% fine to coarse sand; 20% silt; non-plastic; high estimated K; no odor
	Bottom of boring at 16.5'
20	
25	
30	

AQUA SCIENCE ENGINEERS, INC.

SOIL BORING LOG AND MONITORING WELL COMPLETION DETAILS		Well MW-8
Project Name: Oakland Truck Stop	Project Location: 8225 San Leandro Street, Oakland, CA	Page 1 of 1
Driller: Gregg Drilling	Type of Rig: Hollow-Stem Auger	Size of Drill: 8.0" Diameter
Logged By: Robert E. Kitay, R.G.	Date Drilled: July 8, 2002	Checked By: Robert E. Kitay, R.G.

WATER AND WELL DATA

Depth of Water First Encountered: 11'	Total Depth of Well Completed: 15'
	Well Screen Type and Diameter: 2" Diameter PVC Casing
Static Depth of Water in Boring:	Well Screen Slot Size: 0.020"
Total Depth of Boring: 15.5'	Type and Size of Soil Sampler: 2.0" I.D. Split-Barrel Sampler



DESCRIPTION OF LITHOLOGY

standard classification, texture, relative moisture, density, stiffness, odor-staining, USCS designation.

Gravel Road-Base and Fill

Silty CLAY (CH); black; stiff; dry; 70% clay; 30% silt; high plasticity; very low estimated K; no odor

moist at 6'

Clayey SILT (MH); olive; medium stiff; moist; 70% silt; 30% clay; high plasticity; low estimated K; no odor

wet at 11'

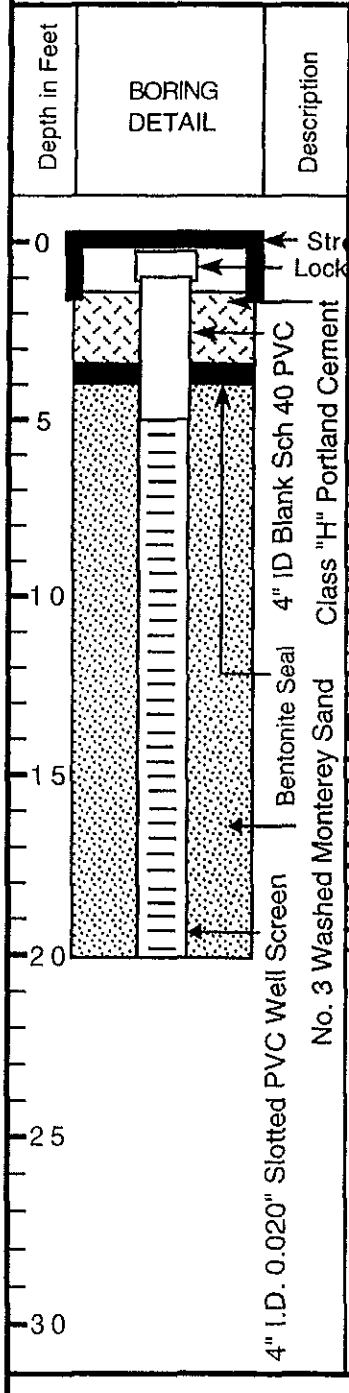
Silty SAND (SM); grey; loose; wet; 60-80% medium to coarse sand; 20-40% silt; non-plastic; high estimated K; no odor

Bottom of boring at 15.5'

SOIL BORING LOG AND MONITORING WELL COMPLETION DETAILS		Well MW-9
Project Name: Oakland Truck Stop	Project Location: 8225 San Leandro Street, Oakland, CA	Page 1 of 1
Driller: Gregg Drilling	Type of Rig: Hollow-Stem Auger	Size of Drill: 10.0" Diameter
Logged By: Robert E. Kitay, R.G.	Date Drilled: July 8, 2002	Checked By: Robert E. Kitay, R.G.

WATER AND WELL DATA

Depth of Water First Encountered: 16'	Total Depth of Well Completed: 20'
	Well Screen Type and Diameter: 4" Diameter PVC Casing
Static Depth of Water in Boring:	Well Screen Slot Size: 0.020"
Total Depth of Boring: 20'	Type and Size of Soil Sampler: 2.0" I.D. Split-Barrel Sampler



DESCRIPTION OF LITHOLOGY

standard classification, texture, relative moisture, density, stiffness, odor-staining, USCS designation.

0 – Gravel Road-Base and Fill

Silty CLAY (CH); black; stiff; dry; 80% clay; 20% silt; high plasticity; very low estimated K; no odor

Sandy SILT (ML); olive; medium stiff; wet; 60% silt; 40% fine sand; non-plastic; medium estimated K; no odor

20 – Bottom of boring at 20'

AQUA SCIENCE ENGINEERS, INC.

APPENDIX D

Well Sampling Field Logs

aqua science engineers inc.

WELL SAMPLING FIELD LOG

Project Name and Address: OTS
Job #: _____ Date of sampling: _____
Well Name: MW-1 Sampled by: _____
Total depth of well (feet): _____ Well diameter (inches): _____
Depth to water before sampling (feet): 6.35 - 6.89
Thickness of floating product if any: _____
Depth of well casing in water (feet): _____
Number of gallons per well casing volume (gallons): _____
Number of well casing volumes to be removed: _____
Req'd volume of groundwater to be purged before sampling (gallons): _____
Equipment used to purge the well: _____
Time Evacuation Began: _____ Time Evacuation Finished: _____
Approximate volume of groundwater purged: _____
Did the well go dry? NOT Sampled After how many gallons: _____
Time samples were collected: _____
Depth to water at time of sampling: _____
Percent recovery at time of sampling: _____
Samples collected with: _____
Sample color: _____ Odor: _____
Description of sediment in sample: _____

CHEMICAL DATA

Volume Purged	Temp	pH	Conductivity

SAMPLES COLLECTED

Sample	# of containers	Volume & type container	Pres	Iced?	Analysis

aqua science engineers inc.

WELL SAMPLING FIELD LOG

Project Name and Address: OTS
Job #: 3540 Date of sampling: 9/4
Well Name: MW-2 Sampled by: EP
Total depth of well (feet): 15.50 Well diameter (inches): 2
Depth to water before sampling (feet): 6.17
Thickness of floating product if any: -
Depth of well casing in water (feet): 9.33
Number of gallons per well casing volume (gallons): 1.5
Number of well casing volumes to be removed: 3
Req'd volume of groundwater to be purged before sampling (gallons): 4.5
Equipment used to purge the well: bailer
Time Evacuation Began: 1135 Time Evacuation Finished: 1150
Approximate volume of groundwater purged: 4.5
Did the well go dry?: no After how many gallons: -
Time samples were collected: 1200
Depth to water at time of sampling: -
Percent recovery at time of sampling: -
Samples collected with: bailer
Sample color: clear/brown Odor:
Description of sediment in sample: silt

CHEMICAL DATA

Volume Purged	Temp	pH	Conductivity
1	73.4	6.61	1983
2	73.0	6.58	1964
3	72.7	6.54	1959

SAMPLES COLLECTED

Sample	# of containers	Volume & type container	Pres	Iced?	Analysis
MW-2	5	40 ml VOA	X	X	

aqua science engineers inc.

WELL SAMPLING FIELD LOG

Project Name and Address: OTS
Job #: 3540 Date of sampling: 9/4/02
Well Name: MW-3 Sampled by: EP
Total depth of well (feet): 15.06 Well diameter (inches): 2
Depth to water before sampling (feet): 5.72
Thickness of floating product if any: -
Depth of well casing in water (feet): 9.34
Number of gallons per well casing volume (gallons): 1.49
Number of well casing volumes to be removed: 3
Req'd volume of groundwater to be purged before sampling (gallons): 4.5
Equipment used to purge the well: bailer
Time Evacuation Began: 1100 Time Evacuation Finished: 1115
Approximate volume of groundwater purged: 4.5
Did the well go dry?: NO After how many gallons: -
Time samples were collected: 1125
Depth to water at time of sampling: -
Percent recovery at time of sampling: -
Samples collected with: bailer
Sample color: clear/grey Odor: moderate
Description of sediment in sample: silt

CHEMICAL DATA

Volume Purged	Temp	pH	Conductivity
1	74.0	6.57	1514
2	73.9	6.56	1452
3	73.7	6.55	1445

SAMPLES COLLECTED

Sample	# of containers	Volume & type container	Pres	Iced?	Analysis
MW-3	5	40 ml VOA	x	x	

aqua science engineers inc.

WELL SAMPLING FIELD LOG

Project Name and Address: OTS
Job #: 3540 Date of sampling: 9/4/02
Well Name: MW-4 Sampled by: EP
Total depth of well (feet): 14.75 Well diameter (inches): 2
Depth to water before sampling (feet): 5.97
Thickness of floating product if any: -
Depth of well casing in water (feet): 8.78
Number of gallons per well casing volume (gallons): 1.4
Number of well casing volumes to be removed: 3
Req'd volume of groundwater to be purged before sampling (gallons): 4.2
Equipment used to purge the well: bailer
Time Evacuation Began: 1240 Time Evacuation Finished: 1255
Approximate volume of groundwater purged: 4
Did the well go dry?: No After how many gallons: -
Time samples were collected: 1300
Depth to water at time of sampling: -
Percent recovery at time of sampling: -
Samples collected with: bailer
Sample color: clear/brown Odor: none
Description of sediment in sample: silt

CHEMICAL DATA

Volume Purged	Temp	pH	Conductivity
1	75.3	6.79	1500
2	74.9	6.72	1499
3	74.6	6.70	1497

SAMPLES COLLECTED

Sample	# of containers	Volume & type container	Pres	Iced?	Analysis
MW-4	5	40 ml VOA	x	x	

aqua science engineers inc.

WELL SAMPLING FIELD LOG

Project Name and Address: OTS
Job #: 3546 Date of sampling: 9/4/02
Well Name: MW-5 Sampled by: EP
Total depth of well (feet): 13.70 Well diameter (inches): 2
Depth to water before sampling (feet): 5.62
Thickness of floating product if any: -
Depth of well casing in water (feet): 8.08
Number of gallons per well casing volume (gallons): 1.29
Number of well casing volumes to be removed: 3
Req'd volume of groundwater to be purged before sampling (gallons): 4
Equipment used to purge the well: bailer
Time Evacuation Began: 1210 Time Evacuation Finished: 1225
Approximate volume of groundwater purged: 4
Did the well go dry?: no After how many gallons: -
Time samples were collected: 1230
Depth to water at time of sampling: -
Percent recovery at time of sampling: -
Samples collected with: bailer
Sample color: clear | brown Odor: none
Description of sediment in sample: silt

CHEMICAL DATA

Volume Purged	Temp	pH	Conductivity
1	75.8	6.69	1398
2	75.2	6.65	13.81
3	74.9	6.63	1377

SAMPLES COLLECTED

Sample	# of containers	Volume & type container	Pres	Iced?	Analysis
MW-5	5	40 ml VOA	x	x	

aqua science engineers inc.

WELL SAMPLING FIELD LOG

Project Name and Address: Oakland Truck Stop
Job #: 3540 Date of sampling: 9/4/02
Well Name: MW-6 Sampled by: EP
Total depth of well (feet): 14.36 Well diameter (inches): 2
Depth to water before sampling (feet): 5.92
Thickness of floating product if any: -
Depth of well casing in water (feet): 8.44
Number of gallons per well casing volume (gallons): 1.35
Number of well casing volumes to be removed: 3
Req'd volume of groundwater to be purged before sampling (gallons): 4
Equipment used to purge the well: bailer
Time Evacuation Began: 925 Time Evacuation Finished: 940
Approximate volume of groundwater purged: 4
Did the well go dry?: no After how many gallons: -
Time samples were collected: 945
Depth to water at time of sampling: -
Percent recovery at time of sampling: -
Samples collected with: bailer
Sample color: clear/ gray Odor: moderate
Description of sediment in sample: silt

CHEMICAL DATA

Volume Purged	Temp	pH	Conductivity
1	69.7	6.68	1113
2	69.7	6.67	1008
3	69.8	6.67	970

SAMPLES COLLECTED

Sample	# of containers	Volume & type container	Pres	Iced?	Analysis
MW-4	5	40 ml VOA	x	x	

aqua science engineers inc.

WELL SAMPLING FIELD LOG

Project Name and Address: OTS
Job #: 3540 Date of sampling: 9/4/02
Well Name: MW-7 Sampled by: EP
Total depth of well (feet): 16.42 Well diameter (inches): 2
Depth to water before sampling (feet): 4.67
Thickness of floating product if any: -
Depth of well casing in water (feet): 11.75
Number of gallons per well casing volume (gallons): 1.88
Number of well casing volumes to be removed: 3
Req'd volume of groundwater to be purged before sampling (gallons): 5.64
Equipment used to purge the well: bailer
Time Evacuation Began: 1020 Time Evacuation Finished: 1040
Approximate volume of groundwater purged: 5.5
Did the well go dry?: no After how many gallons: -
Time samples were collected: 1050
Depth to water at time of sampling: -
Percent recovery at time of sampling: -
Samples collected with: bailer
Sample color: clear/ brown Odor: none
Description of sediment in sample: silt

CHEMICAL DATA

Volume Purged	Temp	pH	Conductivity
1	72.4	6.77	1541
2	69.1	6.78	1548
3	68.3	6.78	1552

SAMPLES COLLECTED

Sample	# of containers	Volume & type container	Pres	Iced?	Analysis
MW-7	5	40 ml VOA	Y	Y	

aqua science engineers inc.

WELL SAMPLING FIELD LOG

Project Name and Address: Oakland Truckstop
Job #: 3540 Date of sampling: 9/4/02
Well Name: MW-8 Sampled by: EP
Total depth of well (feet): 15.02 Well diameter (inches): 2
Depth to water before sampling (feet): 4.94
Thickness of floating product if any: -
Depth of well casing in water (feet): 10.08
Number of gallons per well casing volume (gallons): 1.61
Number of well casing volumes to be removed: 3
Req'd volume of groundwater to be purged before sampling (gallons): 4.8
Equipment used to purge the well: bailer
Time Evacuation Began: 955 Time Evacuation Finished: 1010
Approximate volume of groundwater purged: 5
Did the well go dry?: no After how many gallons: -
Time samples were collected: 1015
Depth to water at time of sampling: -
Percent recovery at time of sampling: -
Samples collected with: bailer
Sample color: clear/brown Odor: none
Description of sediment in sample: silt

CHEMICAL DATA

Volume Purged	Temp	pH	Conductivity
1	66.2	7.07	1581
2	67.5	7.12	1581
3	67.3	7.17	1581

SAMPLES COLLECTED

Sample	# of containers	Volume & type container	Pres	Iced?	Analysis
MW-8	5	40 ml VOA	X	X	

aqua science engineers inc.

WELL SAMPLING FIELD LOG

Project Name and Address: OTS
Job #: 3540 Date of sampling: 9/5/02
Well Name: MW-9 Sampled by: EP
Total depth of well (feet): 19.90 Well diameter (inches): 4
Depth to water before sampling (feet): 6.26
Thickness of floating product if any: -
Depth of well casing in water (feet): 13.64
Number of gallons per well casing volume (gallons): 8
Number of well casing volumes to be removed: 3
Req'd volume of groundwater to be purged before sampling (gallons): 24
Equipment used to purge the well: Sub pump
Time Evacuation Began: 1410 Time Evacuation Finished: 1445
Approximate volume of groundwater purged: 25
Did the well go dry?: No After how many gallons: -
Time samples were collected: 1455
Depth to water at time of sampling: -
Percent recovery at time of sampling: -
Samples collected with: bailer
Sample color: clear/ brown Odor: none
Description of sediment in sample: silt

CHEMICAL DATA

Volume Purged	Temp	pH	Conductivity
1	76.0	6.10	1101
2	72.8	6.69	1056
3	72.4	6.76	1049

SAMPLES COLLECTED

Sample	# of containers	Volume & type container	Pres	Iced?	Analysis
MW-9	5	40 ml VOA	x	x	

APPENDIX E

Analytical Reports
And Chain of Custody
for Soil Samples

KIFF ANALYTICAL LLC

Report Number : 27428
Date : 7/19/2002

Robert Kitay
Aqua Science Engineers, Inc.
208 West El Pintado Rd.
Danville, CA 94526

Subject : 6 Soil Samples
Project Name : Oakland Truck Stop
Project Number : 3540

Dear Mr. Kitay,

Chemical analysis of the samples referenced above has been completed. Summaries of the data are contained on the following pages. Sample(s) were received under documented chain-of-custody. US EPA protocols for sample storage and preservation were followed.

Kiff Analytical is certified by the State of California (# 2236). If you have any questions regarding procedures or results, please call me at 530-297-4800.

Sincerely,

Joel Kiff

Joel Kiff

KIFF ANALYTICAL LLC

Report Number : 27428
Date : 7/19/2002

Project Name : **Oakland Truck Stop**
Project Number : **3540**

Sample : **MW-7 10.5'** Matrix : Soil Lab Number : 27428-02
Sample Date :7/8/2002

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Benzene	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	7/16/2002
Toluene	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	7/16/2002
Ethylbenzene	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	7/16/2002
Total Xylenes	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	7/16/2002
Methyl-t-butyl ether (MTBE)	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	7/16/2002
Diisopropyl ether (DIPE)	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	7/16/2002
Ethyl-t-butyl ether (ETBE)	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	7/16/2002
Tert-amyl methyl ether (TAME)	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	7/16/2002
Tert-Butanol	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	7/16/2002
TPH as Gasoline	**< 1.0**	1.0	mg/Kg	EPA 8260B	7/16/2002
Toluene - d8 (Surr)	97.1		% Recovery	EPA 8260B	7/16/2002
4-Bromofluorobenzene (Surr)	107		% Recovery	EPA 8260B	7/16/2002
TPH as Diesel	**< 1.0**	1.0	mg/Kg	M EPA 8015	7/18/2002
TPH as Motor Oil	**< 10**	10	mg/Kg	M EPA 8015	7/18/2002
1-Chlorooctadecane (Diesel Surrogate)	111		% Recovery	M EPA 8015	7/18/2002

Approved By: Joel Kiff

720 Olive Drive, Suite D Davis, CA 95616 530-297-4800

KIFF ANALYTICAL LLC

Report Number : 27428
Date : 7/19/2002

Project Name : **Oakland Truck Stop**
Project Number : **3540**

Sample : **MW-8 11.0'** Matrix : Soil Lab Number : 27428-04
Sample Date :7/8/2002

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Benzene	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	7/16/2002
Toluene	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	7/16/2002
Ethylbenzene	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	7/16/2002
Total Xylenes	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	7/16/2002
Methyl-t-butyl ether (MTBE)	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	7/16/2002
Diisopropyl ether (DIPE)	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	7/16/2002
Ethyl-t-butyl ether (ETBE)	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	7/16/2002
Tert-amyl methyl ether (TAME)	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	7/16/2002
Tert-Butanol	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	7/16/2002
TPH as Gasoline	**< 1.0**	1.0	mg/Kg	EPA 8260B	7/16/2002
Toluene - d8 (Surr)	97.7		% Recovery	EPA 8260B	7/16/2002
4-Bromofluorobenzene (Surr)	94.7		% Recovery	EPA 8260B	7/16/2002
TPH as Diesel	**3.9**	1.0	mg/Kg	M EPA 8015	7/18/2002
TPH as Motor Oil	**< 10**	10	mg/Kg	M EPA 8015	7/18/2002
1-Chlorooctadecane (Diesel Surrogate)	100		% Recovery	M EPA 8015	7/18/2002

Approved By: Joel Kiff

720 Olive Drive, Suite D Davis, CA 95616 530-297-4800

KIFF ANALYTICAL LLC

Report Number : 27428
Date : 7/19/2002

Project Name : **Oakland Truck Stop**
Project Number : **3540**

Sample : **MW-9 13.0'** Matrix : Soil Lab Number : 27428-06
Sample Date :7/8/2002

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Benzene	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	7/16/2002
Toluene	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	7/16/2002
Ethylbenzene	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	7/16/2002
Total Xylenes	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	7/16/2002
Methyl-t-butyl ether (MTBE)	**0.0058**	0.0050	mg/Kg	EPA 8260B	7/16/2002
Diisopropyl ether (DIPE)	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	7/16/2002
Ethyl-t-butyl ether (ETBE)	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	7/16/2002
Tert-amyl methyl ether (TAME)	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	7/16/2002
Tert-Butanol	**0.0051**	0.0050	mg/Kg	EPA 8260B	7/16/2002
TPH as Gasoline	**< 1.0**	1.0	mg/Kg	EPA 8260B	7/16/2002
Toluene - d8 (Surr)	97.9		% Recovery	EPA 8260B	7/16/2002
4-Bromofluorobenzene (Surr)	94.5		% Recovery	EPA 8260B	7/16/2002
TPH as Diesel	**< 1.0**	1.0	mg/Kg	M EPA 8015	7/18/2002
TPH as Motor Oil	**15**	10	mg/Kg	M EPA 8015	7/18/2002
1-Chlorooctadecane (Diesel Surrogate)	109		% Recovery	M EPA 8015	7/18/2002

Approved By: Joel Kiff

720 Olive Drive, Suite D Davis, CA 95616 530-297-4800

Report Number : 27428

Date : 7/19/2002

QC Report : Method Blank Data

Project Name : **Oakland Truck Stop**

Project Number : **3540**

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
TPH as Diesel	< 1.0	1 0	mg/Kg	M EPA 8015	7/17/2002
TPH as Motor Oil	< 10	10	mg/Kg	M EPA 8015	7/17/2002
1-Chlorooctadecane (Diesel Surrogate)	99 5		%	M EPA 8015	7/17/2002
Benzene	< 0.0050	0.0050	mg/Kg	EPA 8260B	7/16/2002
Toluene	< 0.0050	0.0050	mg/Kg	EPA 8260B	7/16/2002
Ethylbenzene	< 0.0050	0 0050	mg/Kg	EPA 8260B	7/16/2002
Total Xylenes	< 0.0050	0.0050	mg/Kg	EPA 8260B	7/16/2002
Methyl-t-butyl ether (MTBE)	< 0.0050	0 0050	mg/Kg	EPA 8260B	7/16/2002
Diisopropyl ether (DIPE)	< 0.0050	0.0050	mg/Kg	EPA 8260B	7/16/2002
Ethyl-t-butyl ether (ETBE)	< 0.0050	0.0050	mg/Kg	EPA 8260B	7/16/2002
Tert-amyl methyl ether (TAME)	< 0.0050	0.0050	mg/Kg	EPA 8260B	7/16/2002
Tert-Butanol	< 0.0050	0 0050	mg/Kg	EPA 8260B	7/16/2002
TPH as Gasoline	< 1.0	1.0	mg/Kg	EPA 8260B	7/16/2002
Toluene - d8 (Surr)	96.0		%	EPA 8260B	7/16/2002
4-Bromofluorobenzene (Surr)	105		%	EPA 8260B	7/16/2002

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed

Approved By: Joel Kiff

KIFF ANALYTICAL, LLC

720 Olive Drive, Suite D Davis, CA 95616 530-297-4800

Report Number : 27428

QC Report : Matrix Spike/ Matrix Spike Duplicate

Date : 7/19/2002

Project Name : **Oakland Truck Stop**

Project Number : **3540**

Parameter	Spiked Sample	Sample Value	Spike Level	Spike Dup. Level	Spiked Sample Value	Duplicate Spiked Sample Value	Units	Analysis Method	Date Analyzed	Spiked Sample Percent Recov.	Duplicate Spiked Sample Percent Recov.	Relative Percent Diff.	Spiked Sample Percent Recov. Limit	Relative Percent Diff. Limit
TPH as Diesel	27463-01	<1.0	20.0	20.0	19.4	19.1	mg/Kg	M EPA 8015	7/17/02	97.0	95.5	1.48	60-140	25
Benzene	27428-02	<0.0050	0.0394	0.0398	0.0413	0.0403	mg/Kg	EPA 8260B	7/17/02	105	101	3.27	70-130	25
Toluene	27428-02	<0.0050	0.0394	0.0398	0.0379	0.0375	mg/Kg	EPA 8260B	7/17/02	96.2	94.4	1.99	70-130	25
Tert-Butanol	27428-02	<0.0050	0.197	0.199	0.205	0.207	mg/Kg	EPA 8260B	7/17/02	104	104	0.240	70-130	25
Methyl-t-Butyl Ether	27428-02	<0.0050	0.0394	0.0398	0.0372	0.0368	mg/Kg	EPA 8260B	7/17/02	94.5	92.6	2.08	70-130	25

Approved By: Joel Kiff

KIFF ANALYTICAL, LLC

720 Olive Drive, Suite D Davis, CA 95616 530-297-4800

Report Number : 27428

Date : 7/19/2002

QC Report : Laboratory Control Sample (LCS)

Project Name : **Oakland Truck Stop**

Project Number : **3540**

Parameter	Spike Level	Units	Analysis Method	Date Analyzed	LCS Percent Recov.	LCS Percent Recov. Limit
TPH as Diesel	20.0	mg/Kg	M EPA 8015	7/17/02	96.6	70-130
Benzene	0.0398	mg/Kg	EPA 8260B	7/15/02	96.0	70-130
Toluene	0.0398	mg/Kg	EPA 8260B	7/15/02	92.4	70-130
Tert-Butanol	0.199	mg/Kg	EPA 8260B	7/15/02	94.7	70-130
Methyl-t-Butyl Ether	0.0398	mg/Kg	EPA 8260B	7/15/02	81.4	70-130

Approved By: Joel Kiff

KIFF ANALYTICAL, LLC

720 Olive Drive, Suite D Davis, CA 95616 530-297-4800

Aqua Science Engineers, Inc.
208 W. El Pintado Road
Danville, CA 94526
(925) 820-9391
FAX (925) 837-4853

Chain of Custody 27428

PAGE 1 OF 1

SAMPLER (SIGNATURE): Robert E. Kitay (PHONE NO.) (925) 820-9391

PROJECT NAME: Oakland Truck Stop JOB NO. 3540

ADDRESS: 8255 San Leandro Street, Oakland DATE 7-8-02

ANALYSIS REQUEST

SPECIAL INSTRUCTIONS:

SAMPLE ID.	DATE	TIME	MATRIX	NO. OF SAMPLES	TPH-GAS / MTBE & BTEX (EPA 5030/8015-8020)	TPH-GASOLINE (EPA 5030/8015)	TPH-DIESEL + Motor oil (EPA 3510/8015)	PURGEABLE HALOCARBONS (EPA 601/8010)	PURGEABLE AROMATICS (EPA 602/8020)	VOLATILE ORGANICS (EPA 624/8240)	SEMI-VOLATILE ORGANICS (EPA 625/8270)	OIL & GREASE (EPA 5520)	LUFT METALS (5) (EPA 6010+7000)	CAM 17 METALS (EPA 6010+7000)	PCBs & PESTICIDES (EPA 608/8080)	ORGANOPHOSPHORUS PESTICIDES (EPA 8140)	ORGANOCHLORINE HERBICIDES (EPA 8150)	FUEL OXYGENATES (EPA 8260)	TPH-G/BTEX/5 oxys (EPA 8260)	HOLD		COMPOSITE	
MW-7 6.0	7/8	9:38	Soil	1																X			01
MW-7 10.5'		9:43					X												X				02
MW-8 6.0		11:55																		X			03
MW-8 11-0'		12:25					X												X				04
MW-9 5.0'		14:41																		X			05
MW-9 13.0'	↓	14:45	↓	↓			X												X				06

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY LABORATORY:	COMMENTS:
Robert E. Kitay 9:45 (signature) (time)	(signature) (time)	(signature) (time)	John Cuttle 0945 (signature) (time)	Normal T.A.T.
Robert E. Kitay 7-11-02 (printed name) (date)	(printed name) (date)	(printed name) (date)	John Cuttle 071102 (printed name) (date)	
Company- ASE	Company-	Company-	Company- KIFF ANALYTICAL	

APPENDIX F

Analytical Reports
And Chain of Custody
for Groundwater Samples

KIFF ANALYTICAL LLC

Report Number : 28449
Date : 9/23/02

Eric Paddleford
Aqua Science Engineers, Inc.
208 West El Pintado Rd.
Danville, CA 94526

Subject : 8 Water Samples
Project Name : Oakland Truck Stop
Project Number : 3540

Dear Mr. Paddleford,

Chemical analysis of the samples referenced above has been completed. Summaries of the data are contained on the following pages. Sample(s) were received under documented chain-of-custody. US EPA protocols for sample storage and preservation were followed.

Kiff Analytical is certified by the State of California (# 2236). If you have any questions regarding procedures or results, please call me at 530-297-4800.

Sincerely,

Joel Kiff

Joel Kiff

KIFF ANALYTICAL LLC

Report Number : 28449
Date : 9/23/02

Subject : 8 Water Samples
Project Name : Oakland Truck Stop
Project Number : 3540

Case Narrative

Hydrocarbons reported as TPH as Diesel do not exhibit a typical Diesel chromatographic pattern for sample MW-7. Matrix Spike/Matrix Spike Duplicate Results associated with samples MW-9, MW-6, MW-3 for the analyte Methyl-t-butyl ether were affected by the analyte concentrations already present in the un-spiked sample.

Approved By: Joel Kiff

720 Olive Drive, Suite D Davis, CA 95616 916-297-4800

KIFF ANALYTICAL LLC

Report Number : 28449
Date : 9/23/02

Project Name : **Oakland Truck Stop**
Project Number : **3540**

Sample : **MW-2** Matrix : Water Lab Number : 28449-01
Sample Date :9/4/02

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Benzene	**1.6**	0.50	ug/L	EPA 8260B	9/10/02
Toluene	**< 0.50**	0.50	ug/L	EPA 8260B	9/10/02
Ethylbenzene	**< 0.50**	0.50	ug/L	EPA 8260B	9/10/02
Total Xylenes	**< 0.50**	0.50	ug/L	EPA 8260B	9/10/02
Methyl-t-butyl ether (MTBE)	**45**	0.50	ug/L	EPA 8260B	9/10/02
Diisopropyl ether (DIPE)	**2.5**	0.50	ug/L	EPA 8260B	9/10/02
Ethyl-t-butyl ether (ETBE)	**< 0.50**	0.50	ug/L	EPA 8260B	9/10/02
Tert-amyl methyl ether (TAME)	**< 0.50**	0.50	ug/L	EPA 8260B	9/10/02
Tert-Butanol	**67**	5.0	ug/L	EPA 8260B	9/10/02
TPH as Gasoline	**910**	50	ug/L	EPA 8260B	9/10/02
Toluene - d8 (Surr)	96.9		% Recovery	EPA 8260B	9/10/02
4-Bromofluorobenzene (Surr)	104		% Recovery	EPA 8260B	9/10/02
TPH as Diesel	**510**	50	ug/L	M EPA 8015	9/19/02

Approved By: Joel Kiff

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KIFF ANALYTICAL LLC

Report Number : 28449
Date : 9/23/02

Project Name : **Oakland Truck Stop**
Project Number : **3540**

Sample : **MW-3** Matrix : Water Lab Number : 28449-02
Sample Date :9/4/02

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Benzene	**11000**	50	ug/L	EPA 8260B	9/17/02
Toluene	**< 50**	50	ug/L	EPA 8260B	9/17/02
Ethylbenzene	**140**	50	ug/L	EPA 8260B	9/17/02
Total Xylenes	**< 50**	50	ug/L	EPA 8260B	9/17/02
Methyl-t-butyl ether (MTBE)	**3200**	50	ug/L	EPA 8260B	9/17/02
Diisopropyl ether (DIPE)	**< 50**	50	ug/L	EPA 8260B	9/17/02
Ethyl-t-butyl ether (ETBE)	**< 50**	50	ug/L	EPA 8260B	9/17/02
Tert-amyl methyl ether (TAME)	**< 50**	50	ug/L	EPA 8260B	9/17/02
Tert-Butanol	**1400**	500	ug/L	EPA 8260B	9/17/02
TPH as Gasoline	**24000**	5000	ug/L	EPA 8260B	9/17/02
Toluene - d8 (Surr)	99.3		% Recovery	EPA 8260B	9/17/02
4-Bromofluorobenzene (Surr)	91.3		% Recovery	EPA 8260B	9/17/02
TPH as Diesel	**17000**	50	ug/L	M EPA 8015	9/19/02

Approved By: Joel Kiff

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KIFF ANALYTICAL LLC

Report Number : 28449
Date : 9/23/02

Project Name : **Oakland Truck Stop**
Project Number : **3540**

Sample : **MW-4** Matrix : Water Lab Number : 28449-03
Sample Date :9/4/02

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Benzene	**< 0.50**	0.50	ug/L	EPA 8260B	9/10/02
Toluene	**< 0.50**	0.50	ug/L	EPA 8260B	9/10/02
Ethylbenzene	**< 0.50**	0.50	ug/L	EPA 8260B	9/10/02
Total Xylenes	**< 0.50**	0.50	ug/L	EPA 8260B	9/10/02
Methyl-t-butyl ether (MTBE)	**150**	0.50	ug/L	EPA 8260B	9/10/02
Diisopropyl ether (DIPE)	**< 0.50**	0.50	ug/L	EPA 8260B	9/10/02
Ethyl-t-butyl ether (ETBE)	**< 0.50**	0.50	ug/L	EPA 8260B	9/10/02
Tert-amyl methyl ether (TAME)	**< 0.50**	0.50	ug/L	EPA 8260B	9/10/02
Tert-Butanol	**18**	5.0	ug/L	EPA 8260B	9/10/02
TPH as Gasoline	**< 50**	50	ug/L	EPA 8260B	9/10/02
Toluene - d8 (Surr)	92.7		% Recovery	EPA 8260B	9/10/02
4-Bromofluorobenzene (Surr)	100		% Recovery	EPA 8260B	9/10/02
TPH as Diesel	**1100**	50	ug/L	M EPA 8015	9/19/02

Approved By: Joel Kiff

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KIFF ANALYTICAL LLC

Report Number : 28449
Date : 9/23/02

Project Name : **Oakland Truck Stop**
Project Number : **3540**

Sample : **MW-5** Matrix : Water Lab Number : 28449-04
Sample Date :9/4/02

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Benzene	**< 0.50**	0.50	ug/L	EPA 8260B	9/10/02
Toluene	**< 0.50**	0.50	ug/L	EPA 8260B	9/10/02
Ethylbenzene	**< 0.50**	0.50	ug/L	EPA 8260B	9/10/02
Total Xylenes	**< 0.50**	0.50	ug/L	EPA 8260B	9/10/02
Methyl-t-butyl ether (MTBE)	**370**	0.50	ug/L	EPA 8260B	9/10/02
Diisopropyl ether (DIPE)	**3.6**	0.50	ug/L	EPA 8260B	9/10/02
Ethyl-t-butyl ether (ETBE)	**< 0.50**	0.50	ug/L	EPA 8260B	9/10/02
Tert-amyl methyl ether (TAME)	**< 0.50**	0.50	ug/L	EPA 8260B	9/10/02
Tert-Butanol	**72**	5.0	ug/L	EPA 8260B	9/10/02
TPH as Gasoline	**92**	50	ug/L	EPA 8260B	9/10/02
Toluene - d8 (Surr)	93.8		% Recovery	EPA 8260B	9/10/02
4-Bromofluorobenzene (Surr)	103		% Recovery	EPA 8260B	9/10/02
TPH as Diesel	**6100**	50	ug/L	M EPA 8015	9/18/02

Approved By: Joel Kiff

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KIFF ANALYTICAL LLC

Report Number : 28449
Date : 9/23/02

Project Name : **Oakland Truck Stop**
Project Number : **3540**

Sample : **MW-6** Matrix : Water Lab Number : 28449-05
Sample Date :9/4/02

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Benzene	**140**	50	ug/L	EPA 8260B	9/17/02
Toluene	**< 50**	50	ug/L	EPA 8260B	9/17/02
Ethylbenzene	**< 50**	50	ug/L	EPA 8260B	9/17/02
Total Xylenes	**< 50**	50	ug/L	EPA 8260B	9/17/02
Methyl-t-butyl ether (MTBE)	**21000**	50	ug/L	EPA 8260B	9/17/02
Diisopropyl ether (DIPE)	**< 50**	50	ug/L	EPA 8260B	9/17/02
Ethyl-t-butyl ether (ETBE)	**< 50**	50	ug/L	EPA 8260B	9/17/02
Tert-amyl methyl ether (TAME)	**52**	50	ug/L	EPA 8260B	9/17/02
Tert-Butanol	**7500**	500	ug/L	EPA 8260B	9/17/02
TPH as Gasoline	**< 5000**	5000	ug/L	EPA 8260B	9/17/02
Toluene - d8 (Surr)	102		% Recovery	EPA 8260B	9/17/02
4-Bromofluorobenzene (Surr)	89.9		% Recovery	EPA 8260B	9/17/02
TPH as Diesel	**50000**	250	ug/L	M EPA 8015	9/21/02

Approved By: Joel Kiff

720 Olive Drive, Suite D Davis, CA 95616 530-297-4800

KIFF ANALYTICAL LLC

Report Number : 28449
Date : 9/23/02

Project Name : **Oakland Truck Stop**
Project Number : **3540**

Sample : **MW-7** Matrix : Water Lab Number : 28449-06
Sample Date :9/4/02

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Benzene	**< 0.50**	0.50	ug/L	EPA 8260B	9/15/02
Toluene	**< 0.50**	0.50	ug/L	EPA 8260B	9/15/02
Ethylbenzene	**< 0.50**	0.50	ug/L	EPA 8260B	9/15/02
Total Xylenes	**< 0.50**	0.50	ug/L	EPA 8260B	9/15/02
Methyl-t-butyl ether (MTBE)	**3.4**	0.50	ug/L	EPA 8260B	9/15/02
Diisopropyl ether (DIPE)	**< 0.50**	0.50	ug/L	EPA 8260B	9/15/02
Ethyl-t-butyl ether (ETBE)	**< 0.50**	0.50	ug/L	EPA 8260B	9/15/02
Tert-amyl methyl ether (TAME)	**< 0.50**	0.50	ug/L	EPA 8260B	9/15/02
Tert-Butanol	**< 5.0**	5.0	ug/L	EPA 8260B	9/15/02
TPH as Gasoline	**< 50**	50	ug/L	EPA 8260B	9/15/02
Toluene - d8 (Surr)	104		% Recovery	EPA 8260B	9/15/02
4-Bromofluorobenzene (Surr)	95.1		% Recovery	EPA 8260B	9/15/02
TPH as Diesel	**130**	50	ug/L	M EPA 8015	9/18/02

Approved By: Joel Kiff

720 Olive Drive, Suite D Davis, CA 95616 530-297-4800

KIFF ANALYTICAL LLC

Report Number : 28449
Date : 9/23/02

Project Name : **Oakland Truck Stop**
Project Number : **3540**

Sample : **MW-8** Matrix : Water Lab Number : 28449-07
Sample Date :9/4/02

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Benzene	**< 0.50**	0.50	ug/L	EPA 8260B	9/15/02
Toluene	**< 0.50**	0.50	ug/L	EPA 8260B	9/15/02
Ethylbenzene	**< 0.50**	0.50	ug/L	EPA 8260B	9/15/02
Total Xylenes	**< 0.50**	0.50	ug/L	EPA 8260B	9/15/02
Methyl-t-butyl ether (MTBE)	**< 0.50**	0.50	ug/L	EPA 8260B	9/15/02
Diisopropyl ether (DIPE)	**< 0.50**	0.50	ug/L	EPA 8260B	9/15/02
Ethyl-t-butyl ether (ETBE)	**< 0.50**	0.50	ug/L	EPA 8260B	9/15/02
Tert-amyl methyl ether (TAME)	**< 0.50**	0.50	ug/L	EPA 8260B	9/15/02
Tert-Butanol	**< 5.0**	5.0	ug/L	EPA 8260B	9/15/02
TPH as Gasoline	**< 50**	50	ug/L	EPA 8260B	9/15/02
Toluene - d8 (Surr)	105		% Recovery	EPA 8260B	9/15/02
4-Bromofluorobenzene (Surr)	97.7		% Recovery	EPA 8260B	9/15/02
TPH as Diesel	**170**	50	ug/L	M EPA 8015	9/18/02

Approved By: Joel Kiff

720 Olive Drive, Suite D Davis, CA 95616 530-297-4800

KIFF ANALYTICAL LLC

Report Number : 28449
Date : 9/23/02

Project Name : **Oakland Truck Stop**
Project Number : **3540**

Sample : **MW-9** Matrix : Water Lab Number : 28449-08
Sample Date :9/5/02

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Benzene	**< 25**	25	ug/L	EPA 8260B	9/17/02
Toluene	**< 25**	25	ug/L	EPA 8260B	9/17/02
Ethylbenzene	**< 25**	25	ug/L	EPA 8260B	9/17/02
Total Xylenes	**< 25**	25	ug/L	EPA 8260B	9/17/02
Methyl-t-butyl ether (MTBE)	**12000**	25	ug/L	EPA 8260B	9/17/02
Diisopropyl ether (DIPE)	**< 25**	25	ug/L	EPA 8260B	9/17/02
Ethyl-t-butyl ether (ETBE)	**< 25**	25	ug/L	EPA 8260B	9/17/02
Tert-amyl methyl ether (TAME)	**70**	25	ug/L	EPA 8260B	9/17/02
Tert-Butanol	**1700**	250	ug/L	EPA 8260B	9/17/02
TPH as Gasoline	**< 2500**	2500	ug/L	EPA 8260B	9/17/02
Toluene - d8 (Surr)	100		% Recovery	EPA 8260B	9/17/02
4-Bromofluorobenzene (Surr)	102		% Recovery	EPA 8260B	9/17/02
TPH as Diesel	**1000**	50	ug/L	M EPA 8015	9/19/02

Approved By: Joel Kiff

720 Olive Drive, Suite D Davis, CA 95616 530-297-4800

Report Number : 28449

Date : 9/23/02

QC Report : Method Blank Data

Project Name : **Oakland Truck Stop**

Project Number : **3540**

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
TPH as Diesel	< 50	50	ug/L	M EPA 8015	9/16/02
Benzene	< 0.50	0 50	ug/L	EPA 8260B	9/18/02
Toluene	< 0.50	0.50	ug/L	EPA 8260B	9/18/02
Ethylbenzene	< 0.50	0 50	ug/L	EPA 8260B	9/18/02
Total Xylenes	< 0.50	0.50	ug/L	EPA 8260B	9/18/02
Methyl-t-butyl ether (MTBE)	< 0 50	0.50	ug/L	EPA 8260B	9/18/02
Diisopropyl ether (DIPE)	< 0.50	0.50	ug/L	EPA 8260B	9/18/02
Ethyl-t-butyl ether (ETBE)	< 0.50	0.50	ug/L	EPA 8260B	9/18/02
Tert-amyl methyl ether (TAME)	< 0.50	0.50	ug/L	EPA 8260B	9/18/02
Tert-Butanol	< 5 0	5 0	ug/L	EPA 8260B	9/18/02
TPH as Gasoline	< 50	50	ug/L	EPA 8260B	9/18/02
Toluene - d8 (Surr)	101		%	EPA 8260B	9/18/02
4-Bromofluorobenzene (Surr)	103		%	EPA 8260B	9/18/02
Benzene	< 0.50	0 50	ug/L	EPA 8260B	9/15/02
Toluene	< 0.50	0.50	ug/L	EPA 8260B	9/15/02
Ethylbenzene	< 0.50	0 50	ug/L	EPA 8260B	9/15/02
Total Xylenes	< 0 50	0.50	ug/L	EPA 8260B	9/15/02
Methyl-t-butyl ether (MTBE)	< 0.50	0.50	ug/L	EPA 8260B	9/15/02
Diisopropyl ether (DIPE)	< 0.50	0.50	ug/L	EPA 8260B	9/15/02
Ethyl-t-butyl ether (ETBE)	< 0 50	0.50	ug/L	EPA 8260B	9/15/02
Tert-amyl methyl ether (TAME)	< 0 50	0.50	ug/L	EPA 8260B	9/15/02
Tert-Butanol	< 5.0	5.0	ug/L	EPA 8260B	9/15/02
TPH as Gasoline	< 50	50	ug/L	EPA 8260B	9/15/02
Toluene - d8 (Surr)	106		%	EPA 8260B	9/15/02
4-Bromofluorobenzene (Surr)	96 0		%	EPA 8260B	9/15/02

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Benzene	< 0.50	0 50	ug/L	EPA 8260B	9/10/02
Toluene	< 0 50	0.50	ug/L	EPA 8260B	9/10/02
Ethylbenzene	< 0 50	0.50	ug/L	EPA 8260B	9/10/02
Total Xylenes	< 0.50	0.50	ug/L	EPA 8260B	9/10/02
Methyl-t-butyl ether (MTBE)	< 0.50	0.50	ug/L	EPA 8260B	9/10/02
Diisopropyl ether (DIPE)	< 0.50	0.50	ug/L	EPA 8260B	9/10/02
Ethyl-t-butyl ether (ETBE)	< 0 50	0 50	ug/L	EPA 8260B	9/10/02
Tert-amyl methyl ether (TAME)	< 0.50	0.50	ug/L	EPA 8260B	9/10/02
Tert-Butanol	< 5.0	5 0	ug/L	EPA 8260B	9/10/02
TPH as Gasoline	< 50	50	ug/L	EPA 8260B	9/10/02
Toluene - d8 (Surr)	92 8		%	EPA 8260B	9/10/02
4-Bromofluorobenzene (Surr)	101		%	EPA 8260B	9/10/02
Benzene	< 0.50	0.50	ug/L	EPA 8260B	9/15/02
Toluene	< 0 50	0.50	ug/L	EPA 8260B	9/15/02
Ethylbenzene	< 0 50	0.50	ug/L	EPA 8260B	9/15/02
Total Xylenes	< 0.50	0.50	ug/L	EPA 8260B	9/15/02
Methyl-t-butyl ether (MTBE)	< 0 50	0.50	ug/L	EPA 8260B	9/15/02
Diisopropyl ether (DIPE)	< 0 50	0.50	ug/L	EPA 8260B	9/15/02
Ethyl-t-butyl ether (ETBE)	< 0.50	0.50	ug/L	EPA 8260B	9/15/02
Tert-amyl methyl ether (TAME)	< 0.50	0.50	ug/L	EPA 8260B	9/15/02
Tert-Butanol	< 5 0	5 0	ug/L	EPA 8260B	9/15/02
TPH as Gasoline	< 50	50	ug/L	EPA 8260B	9/15/02
Toluene - d8 (Surr)	105		%	EPA 8260B	9/15/02
4-Bromofluorobenzene (Surr)	96.0		%	EPA 8260B	9/15/02

Approved By: Joel Kiff

KIFF ANALYTICAL, LLC

720 Olive Drive, Suite D Davis, CA 95616 530-297-4800

Report Number : 28449

QC Report : Matrix Spike/ Matrix Spike Duplicate

Date : 9/23/02

Project Name : **Oakland Truck Stop**

Project Number : **3540**

Parameter	Spiked Sample	Sample Value	Spike Level	Spike Dup. Level	Spiked Sample Value	Duplicate Spiked Sample Value	Units	Analysis Method	Date Analyzed	Spiked Sample Percent Recov.	Duplicate Spiked Sample Percent Recov.	Relative Percent Diff.	Spiked Sample Percent Recov. Limit	Relative Percent Diff. Limit
Benzene	28414-04	<0.50	79.7	79.0	80.6	79.4	ug/L	EPA 8260B	9/18/02	101	100	0.620	70-130	25
Toluene	28414-04	<0.50	79.7	79.0	80.2	78.7	ug/L	EPA 8260B	9/18/02	101	99.6	1.07	70-130	25
Tert-Butanol	28414-04	22	398	395	411	413	ug/L	EPA 8260B	9/18/02	97.6	99.1	1.45	70-130	25
Methyl-t-Butyl Ether	28414-04	540	79.7	79.0	516	512	ug/L	EPA 8260B	9/18/02	0.00	0.00	0.00	70-130	25
Benzene	28449-07	<0.50	40.0	40.0	39.6	38.8	ug/L	EPA 8260B	9/15/02	99.0	97.1	1.96	70-130	25
Toluene	28449-07	<0.50	40.0	40.0	43.5	42.7	ug/L	EPA 8260B	9/15/02	109	107	1.81	70-130	25
Tert-Butanol	28449-07	<5.0	200	200	194	205	ug/L	EPA 8260B	9/15/02	96.9	103	5.80	70-130	25
Methyl-t-Butyl Ether	28449-07	<0.50	40.0	40.0	34.7	34.3	ug/L	EPA 8260B	9/15/02	86.8	85.8	1.10	70-130	25
Benzene	28461-02	<0.50	40.0	40.0	39.6	38.3	ug/L	EPA 8260B	9/10/02	99.0	95.8	3.28	70-130	25
Toluene	28461-02	<0.50	40.0	40.0	37.3	35.8	ug/L	EPA 8260B	9/10/02	93.3	89.4	4.30	70-130	25
Tert-Butanol	28461-02	8.3	200	200	207	211	ug/L	EPA 8260B	9/10/02	99.4	101	1.96	70-130	25
Methyl-t-Butyl Ether	28461-02	<0.50	40.0	40.0	47.9	48.1	ug/L	EPA 8260B	9/10/02	120	120	0.375	70-130	25
Benzene	28449-06	<0.50	40.0	40.0	39.8	39.3	ug/L	EPA 8260B	9/15/02	99.4	98.2	1.26	70-130	25
Toluene	28449-06	<0.50	40.0	40.0	42.8	42.8	ug/L	EPA 8260B	9/15/02	107	107	0.0467	70-130	25
Tert-Butanol	28449-06	<5.0	200	200	196	201	ug/L	EPA 8260B	9/15/02	98.0	100	2.31	70-130	25
Methyl-t-Butyl Ether	28449-06	3.4	40.0	40.0	44.5	43.2	ug/L	EPA 8260B	9/15/02	103	99.4	3.24	70-130	25
TPH as Diesel	Blank	<50	1000	1000	1270	1200	ug/L	M EPA 8015	9/16/02	127	120	5.36	70-130	25

Approved By: Joel Kiff

KIFF ANALYTICAL, LLC

720 Olive Drive, Suite D Davis, CA 95616 530-297-4800

Report Number : 28449

QC Report : Laboratory Control Sample (LCS)

Date : 9/23/02

Project Name : **Oakland Truck Stop**

Project Number : **3540**

Parameter	Spike Level	Units	Analysis Method	Date Analyzed	LCS Percent Recov.	LCS Percent Recov. Limit
Benzene	40.0	ug/L	EPA 8260B	9/18/02	102	70-130
Toluene	40.0	ug/L	EPA 8260B	9/18/02	100	70-130
Tert-Butanol	200	ug/L	EPA 8260B	9/18/02	100	70-130
Methyl-t-Butyl Ether	40.0	ug/L	EPA 8260B	9/18/02	104	70-130
Benzene	40.0	ug/L	EPA 8260B	9/15/02	95.8	70-130
Toluene	40.0	ug/L	EPA 8260B	9/15/02	101	70-130
Tert-Butanol	200	ug/L	EPA 8260B	9/15/02	95.9	70-130
Methyl-t-Butyl Ether	40.0	ug/L	EPA 8260B	9/15/02	83.4	70-130
Benzene	40.0	ug/L	EPA 8260B	9/10/02	99.9	70-130
Toluene	40.0	ug/L	EPA 8260B	9/10/02	87.6	70-130
Tert-Butanol	200	ug/L	EPA 8260B	9/10/02	97.2	70-130
Methyl-t-Butyl Ether	40.0	ug/L	EPA 8260B	9/10/02	102	70-130
Benzene	40.0	ug/L	EPA 8260B	9/15/02	99.9	70-130
Toluene	40.0	ug/L	EPA 8260B	9/15/02	114	70-130
Tert-Butanol	200	ug/L	EPA 8260B	9/15/02	94.7	70-130
Methyl-t-Butyl Ether	40.0	ug/L	EPA 8260B	9/15/02	98.4	70-130

Approved By: Joel Kiff

KIFF ANALYTICAL, LLC

720 Olive Drive, Suite D Davis, CA 95616 530-297-4800

Aqua Science Engineers, Inc.
208 W. El Pintado Road
Danville, CA 94526
(925) 820-9391
FAX (925) 837-4853

Chain of Custody 28449

PAGE 1 OF 1

SAMPLER (SIGNATURE): E Paddleford

PROJECT NAME: Oakland Truck Stop — JOB NO.: 3540

ADDRESS: 8255 San Leandro Street, Oakland, CA

ANALYSIS REQUEST

SPECIAL INSTRUCTIONS:

SAMPLE ID.	DATE	TIME	MATRIX	NO. OF SAMPLES	TPH-GAS / MTBE & BTEX (EPA 5030/8015-8020)	TPH-DIESEL (EPA 3510/8015)	TPH-DIESEL & MOTOR OIL (EPA 3510/8015)	PURGEABLE HALOCARBONS (EPA 601/8010)	VOLATILE ORGANICS (EPA 624/8240/8260)	SEMI-VOLATILE ORGANICS (EPA 625/8270)	OIL & GREASE (EPA 5520)	LUFT METALS (5) (EPA 6010+7000)	CAM 17 METALS (EPA 6010+7000)	PCBs & PESTICIDES (EPA 608/8080)	ORGANOPHOSPHORUS PESTICIDES (EPA 8140 EPA 608/8080)	FUEL OXYGENATES (EPA 8260)	Pb (TOTAL or DISSOLVED) (EPA 6010)	TPH-G/BTEX/5 OXY'S (EPA 8260)	TPH-G/BTEX/ 7 OXY'S / LEAD SCAVANGERS/ 1,2-DCP (EPA 8260)		
MW-2	1200	9/4/02	Water	5		X												X			-01
MW-3	1125					X												X			-02
MW-4	1300					X												X			-03
MW-5	1230					X												X			-04
MW-6	945					X												X			-05
MW-7	1050					X												X			-06
MW-8	1015					X												X			-07
MW-9	1455	9/5/02				X												X			-08

RELINQUISHED BY: (signature) (time)	RECEIVED BY: (signature) (time)	RELINQUISHED BY: (signature) (time)	RECEIVED BY LABORATORY: (signature) (time)
E Paddleford			John Cuttle / 1050
(printed name) (date)	(printed name) (date)	(printed name) (date)	J. CUTTLE / 090602 (printed name) (date)
Company- ASE	Company-	Company-	Company- KIFF

COMMENTS:
1,2-DCP = 1,2-dichloropropane

TURN AROUND TIME
STANDARD 24Hr 48Hr 72Hr
OTHER:

APPENDIX G

Survey Report

MCE

Mid Coast Engineers
Civil Engineers and Land Surveyors
70 Penny Lane, Suite A - Watsonville, CA 95076
phone: (831) 724-2580
fax: (831) 724-8025
e-mail: lee@midcoastengineers.com

Richard A. Wadsworth
Civil Engineer
Stanley O. Nielsen
Land Surveyor
Lee D. Vaage
Land Surveyor
Jeff S. Nielsen
Land Surveyor

July 15, 2002

Robert Kitay
Aqua Science Engineers, Inc.
208 W. El Pintado Road
Danville, CA 94526

Re: **Oakland Truck Stop, 8255 San Leandro Street, Oakland, California;**
Aqua Science Engineers, MCE Job No 02161

Dear Mr. Kitay,

As you requested, on July 11 we surveyed nine monitoring wells located at the referenced site. Our findings are shown on the attached sheets, expressed in State Plane Coordinates and Latitude/Longitude.

A notch was cut in the north rim of the PVC casing (TOC) and a cross chiseled in the north rim of the standard box (TOB).

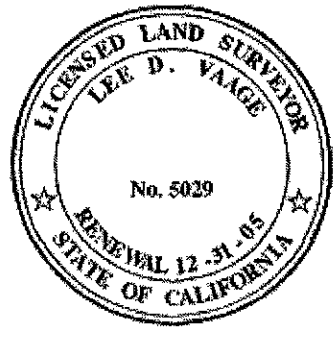
Measurements were obtained from conventional survey techniques in combination with GPS techniques (Code CGPS), using control points HT0281 (M 554) and AA3814 (HPGN D CA 04 FH), as published by NGS/NOAA, and listed on their web site. Latitude and Longitude as shown were determined from the California Coordinate System, Zone 3, NAD 83 Datum. The accuracy range of the reported information is +/- 5mm. GPS equipment is the Trimble 5700 system (Code T57).

The benchmark used for this survey is HT0281, a benchmark disk in a concrete headwall on the east side of Railroad Avenue approximately 500 feet south of 85th Avenue. Elevation = 11.50 feet NGVD '29.

Please let me know if you have questions or need additional information.

Yours truly,

Lee D. Vaage



OAKLAND TRUCK STOP
8255 San Leandro Street
Oakland, California

Aqua Science Engineers

Project : 02161
User name MCE Date & Time 3:36:16 PM 07/15/2002
Coordinate System US State Plane 1983 Zone California Zone 3 0403
Project Datum NAD 1983 (Conus)
Vertical Datum NGVD29
Coordinate Units US survey feet
Distance Units US survey feet
Elevation Units US survey feet

Point listing

Name	Northing	Easting	Elevation	Description
3	2099379.77	6072513.11	9.17	MW-7toc
4	2099380.24	6072513.04	9.40	MW-7tob
5	2099465.48	6072531.46	10.70	MW-2toc
6	2099465.86	6072531.35	10.93	MW-2tob
7	2099455.51	6072586.53	10.33	MW-3toc
8	2099455.78	6072586.50	10.66	MW-3tob
10	2099528.03	6072468.70	10.50	MW-4toc
11	2099528.50	6072468.64	10.76	MW-4tob
12	2099600.85	6072533.52	10.20	MW-5toc
13	2099600.98	6072533.32	10.54	MW-5tob
14	2099435.20	6072631.28	11.07	MW-9toc
15	2099435.64	6072631.29	11.34	MW-9tob
16	2099444.41	6072615.62	10.71	MW-6toc
17	2099444.88	6072615.46	11.11	MW-6tob
18	2099557.04	6072595.30	11.02	MW-1toc
19	2099557.44	6072595.18	11.32	MW-1tob
20	2099392.92	6072580.86	9.68	MW-8toc
21	2099393.43	6072580.90	10.28	MW-8tob
1003	2097964.02	6073182.31	11.50	GPS 0281

OAKLAND TRUCK STOP
8255 San Leandro Street
Oakland, California

Aqua Science Engineers

Project : 02161
User name MCE Date & Time 3:36:16 PM 07/15/2002
Coordinate System US State Plane 1983 Zone California Zone 3 0403
Project Datum NAD 1983 (Conus)
Vertical Datum NGVD29
Coordinate Units US survey feet
Distance Units US survey feet
Elevation Units US survey feet

Point listing

Name	Latitude	Longitude	Elevation	Description
3	37.748363166°N	122.191932907°W	9.17	MW-7toc
4	37.748364457°N	122.191933191°W	9.39	MW-7tob
5	37.748599442°N	122.191874824°W	10.70	MW-2toc
6	37.748600484°N	122.191875223°W	10.93	MW-2tob
7	37.748574787°N	122.191683772°W	10.32	MW-3toc
8	37.748575540°N	122.191683872°W	10.66	MW-3tob
10	37.748768062°N	122.192095780°W	10.50	MW-4toc
11	37.748769348°N	122.192095998°W	10.76	MW-4tob
12	37.748971258°N	122.191876154°W	10.20	MW-5toc
13	37.748971602°N	122.191876852°W	10.54	MW-5tob
14	37.748521243°N	122.191527755°W	11.07	MW-9toc
15	37.748522442°N	122.191527745°W	11.34	MW-9tob
16	37.748545742°N	122.191582477°W	10.71	MW-6toc
17	37.748547040°N	122.191583036°W	11.11	MW-6tob
18	37.748854019°N	122.191659779°W	11.02	MW-1toc
19	37.748855107°N	122.191660218°W	11.32	MW-1tob
20	37.748402650°N	122.191699450°W	9.68	MW-8toc
21	37.748404059°N	122.191699339°W	10.28	MW-8tob
1003	37.744508862°N	122.189530333°W	11.50	GPS 0281

	A	B	C	D	E	F	G	H	I	J
1		MW-1	07/11/2002	11.02	CGPS	29		Mid Coast Engineers		top of casing
2		MW-2	07/11/2002	10.70	CGPS	29		Mid Coast Engineers		top of casing
3		MW-3	07/11/2002	10.32	CGPS	29		Mid Coast Engineers		top of casing
4		MW-4	07/11/2002	10.50	CGPS	29		Mid Coast Engineers		top of casing
5		MW-5	07/11/2002	10.20	CGPS	29		Mid Coast Engineers		top of casing
6		MW-6	07/11/2002	10.71	CGPS	29		Mid Coast Engineers		top of casing
7		MW-7	07/11/2002	9.17	CGPS	29		Mid Coast Engineers		top of casing
8		MW-8	07/11/2002	9.68	CGPS	29		Mid Coast Engineers		top of casing
9		MW-9	07/11/2002	11.07	CGPS	29		Mid Coast Engineers		top of casing

	A	B	C	D	E	F	G	H	I	J	K	L
1		MW-1	MW	07/11/2002	37.7488540	-122.1916598	CGPS	NAD83	0.05	Mid Coast Engineers	T57	top of casing
2		MW-2	MW	07/11/2002	37.7485994	-122.1918748	CGPS	NAD83	0.05	Mid Coast Engineers	T57	top of casing
3		MW-3	MW	07/11/2002	37.7485748	-122.1916838	CGPS	NAD83	0.05	Mid Coast Engineers	T57	top of casing
4		MW-4	MW	07/11/2002	37.7487681	-122.1920958	CGPS	NAD83	0.05	Mid Coast Engineers	T57	top of casing
5		MW-5	MW	07/11/2002	37.7489713	-122.1918762	CGPS	NAD83	0.05	Mid Coast Engineers	T57	top of casing
6		MW-6	MW	07/11/2002	37.7485457	-122.1915825	CGPS	NAD83	0.05	Mid Coast Engineers	T57	top of casing
7		MW-7	MW	07/11/2002	37.7483632	-122.1919329	CGPS	NAD83	0.05	Mid Coast Engineers	T57	top of casing
8		MW-8	MW	07/11/2002	37.7484026	-122.1916994	CGPS	NAD83	0.05	Mid Coast Engineers	T57	top of casing
9		MW-9	MW	07/11/2002	37.7485212	-122.1915278	CGPS	NAD83	0.05	Mid Coast Engineers	T57	top of casing

APPENDIX H

Pump Tests Report
From
H_2OGEOL

H2OGEOL

A GROUND WATER CONSULTANCY

STEP DRAWDOWN TEST AND CONSTANT RATE TEST OF WELL MW-9, AUGUST 27, 2002

8255 SAN LEANDRO STREET OAKLAND, CALIFORNIA

PREPARED FOR
AQUASCIENCE ENGINEERS, INC.
208 W. EL PINTADO STREET
DANVILLE, CALIFORNIA 94526

SEPTEMBER 09, 2002

H2OGEOL A GROUNDWATER CONSULTANCY

P. O. Box 2165 ■ Livermore, California 94551-2165 ■ (925) 373-9211

H2OGEOL
A GROUND WATER CONSULTANCY

P. O. Box 2165 ■ Livermore, California 94551-2165 ■ (925) 373-9211

REPORT CERTIFICATION

STEP DRAWDOWN TEST
AND CONSTANT RATE TEST
OF WELL MW-9, AUGUST 27, 2002

8255 SAN LEANDRO STREET
OAKLAND, CALIFORNIA

This report concerning a three step step drawdown test, and a 600-minute 'constant' rate pump test associated with the remediation project at 8255 San Leandro Street in the City of Oakland, California, has been prepared by H_2OGEOL A GroundWater Consultancy, by and under the professional supervision of the sole proprietor. The findings, recommendations, specifications, or professional opinions are presented after being investigated and prepared in accordance with generally accepted professional environmental hydrogeologic practice. There is no other warranty, either expressed or implied. This report incorporates information, assumptions, and interpretations prepared by others.

REGISTERED GEOLOGIST
GARY D. LOWE
No. 1559
CERTIFIED
ENGINEERING
GEOLOGIST
STATE OF CALIFORNIA

September 09, 2002

This report was prepared by:

REGISTERED GEOLOGIST
GARY D. LOWE
No. 127
CERTIFIED
HYDROGEOLOGIST
STATE OF CALIFORNIA

Gary D. Lowe, R.G.,C.E.G., C.HG.
Principal, Hydrogeologist
H_2OGEOL A GroundWater Consultancy

H2OGEOL
A GROUND WATER CONSULTANCY

P. O. Box 2165 ■ Livermore, California 94551-2165 ■ (925) 373-9211

STEP DRAWDOWN TEST AND CONSTANT RATE TEST OF WELL MW-9, AUGUST 27. 2002

8255 SAN LEANDRO STREET OAKLAND, CALIFORNIA

1.0 INTRODUCTION

This report presents flow rate and water level data collected during a step drawdown test and a 600-minute constant rate pump test of monitoring well MW-9 associated with the remediation project at 8255 San Leandro Street in the City of Oakland, California. These tests were authorized by Aquascience Engineers, Inc. on July 30, 2002.

A step drawdown test was conducted in monitoring well MW-9 on August 08, 2002. The data from the step drawdown test was analyzed and an optimum nominal long term constant rate test pumping rate of 1± gallons per minute (GPM) was selected. During the constant rate pump test water levels were periodically recorded in the pumping well and in five observation wells. The discharge rate from well MW-9 was also periodically recorded from a flow meter.

Water pumped from MW-9 during the step drawdown test was temporarily stored in 55 gallon polydrums. During the constant rate pump test 654 gallons was pumped and also temporarily stored in a rented 600 gallon polytank and a 54 gallon drum

The following table lists the observation wells, the top of PVC casing elevations, and the distances from the pumping well.

Well	Reference Elevation	Distance to well MW-4	
MW-9	11.07	Not Applicable	
MW-6	10.71	18.17	
MW-3	10.33	49.14	
MW-8	9.68	65.80	
MW-2	10.70	104.31	(no response)
MW-1	11.02	127.04	(no response)
MW-7	9.17	130.52	(no response)
MW-4	10.50	187.22	(no response)
MW-5	10.20	192.35	(no response)

Notes: From survey by Mid Coast Engineers, November 29, 2001.

1.1 Pump Test Equipment

The constant rate pump test was performed using a Grundfos Pumps Corporation 5E3 submersible electric pump. This is a 4-inch, five stage pump capable of up to 7 gallons per minute (GPM), depending on the total dynamic head conditions. This pump was powered by a ½-HP, 115-volt, single phase Franklin submersible electric motor. The pumping well was 19.87 feet in depth below the top of the 4-inch PVC casing, being 20.15 feet below the top of the rim of the protective cover. The total available drawdown in the well, the distance from the static water level to the top of the pump, was approximately 10 feet.

Pump discharge during the constant rate test was controlled using a nominal 1.0 GPM flexible membrane orifice flow control valve (Dole™ Flow Regulator). Constancy of flow through these devices is within a few percent at specific differential dynamic head configurations. Similar flow control valves were used for the step drawdown test as discussed below in Section 2. The flow rate was measured using an Omega Engineering, Inc. Totalizing flow meter.

Water levels in eight observation wells and in the pumping well were measured manually.

2.0 STEP DRAWDOWN TEST

A three step, step drawdown test was performed on August 08, 2002. The three steps were conducted at mean flow rates as maintained by DOLE™ Flow Regulators of the indicated nominal flow rates. The following table lists the nominal flow rate, the mean flow rate, the end of step drawdown, and the duration for each step of the step drawdown test

Step	Nominal Flow Rate (GPM)	Mean Flow Rate (GPM)	Drawdown (Ft.)	Step Duration (minutes)
1	0.5	0.48	1.72	30
2	1.0	1.18	4.19	30
3	2.0	2.01	11.16[A]	20

Note A: Projected to equivalent time from test data.

The interpretation of the step drawdown test is provided in Figure 1. This graph is a double logarithmic plot showing the water level drawdown versus the discharge rate. The step drawdown test data points are represented by the three filled circles.

Drawdown in a pumped well is made of two components: aquifer loss (drawdown caused by resistance to laminar flow in the aquifer) and well loss. Well loss is the drawdown required to overcome the resistance to turbulent flow in the vicinity of the well, through the screen and filterpack, and within the well if the pump is tightly fit. Anisotropic aquifer stratification can also affect this relationship. The total drawdown is represented by the following equation:

$$D = BQ + CQ^P$$

where: D = drawdown in the pumped well in Ft.,

Q = flow or discharge rate in GPM,

BQ = aquifer loss,

CQ^P = well loss,

and B, C, and P are coefficients.

Using the data from the step drawdown test:

$$P = 51.627;$$

$$B = 3.5623;$$

and $$C = 3.0636 \times 10^{-15}$$

The curve defined by this equation for the step drawdown test data is shown on Figure 1 as the line passing through the step drawdown test data (solid circles). Dewatering effects are not considered in this interpretation.

A nominal flow rate of 1.0 GPM was selected for the constant rate test.

3.0 CONSTANT RATE TEST DATA

Antecedent (static) water level data was measured prior to the test on August 27, 2002. The drawdown, or discharge, portion of the constant rate pump test began at 08:25 hours on August 27, 2002. The pump was turned off 10-hours, 5-minutes (605 minutes) later at 18:30 hours on August 27, 2002.

DEPTH TO WATER MEASUREMENTS

Well	Before Test		At End of Test	
Date/Time	Time	Depth to Water	Time	Depth to Water
MW-9	07:17	6.12	18:25	14.54
MW-6	07:53	5.78	18:25	7.75
MW-3	07:49	5.53	18:26	5.68
MW-8	07:55	4.77	18:27	5.37
MW-2	07:44	6.00 (hvy sheen)	17:09	5.95
MW-1	07:30	6.62 (0.1 ft fuel)	15:30	Diesel spill over well.
MW-7	07:46	4.50 (sheen)	17:14	4.52 Diurnal response only.
MW-4	07:40	5.81	Not monitored – no response at 130 Ft wells	
MW-5	07:33	5.46 (0.02 Ft fuel)	Not monitored – no response at 130 Ft wells	

A potentiometric surface map for the pre-test data is presented in Figure 2.

3.1 Flow Rate

During the constant rate test the flow rate was controlled by the methods discussed in Section 1.1. The average flow rate during the 600 minutes of the test was 1.08 GPM.

3.2 Drawdown Data

Water level monitoring was conducted between about 07:30 and 18:30 on August 27, 2002. The pumping well, MW-9, and three observation wells (MW-6, MW-3, and MW-8) experienced drawdown in response to the test. All of the listed observation wells experienced an interpretable response for apparent aquifer hydraulic properties.

Semilogarithmic (semi-log) and double logarithmic (log-log) graphs of drawdown versus elapsed time since the pump was started are presented in Figure A1 through A4 in Attachment A for the extraction well (Figure A1) and the observation wells (Figure A2. MW-6; Figure A3, MW-3; and Figure A4, MW-8). The drawdown data collected during the constant rate pump test and corresponding elapsed time is included as Tables A1 and A2.

4.0 CONSTANT RATE TEST INTERPRETATION

4.1 Saturated Thickness

The first encountered water bearing formation beneath 8255 San Leandro Street exists in a semi-confined condition outside the tank excavation and nearby trenches. The borehole lithologic logs for monitoring wells MW-5 through MW-9 show the presence of a sandy silt beginning between depths of 12 to 16 feet and extending to total depth of each well. The wells responding to the test are adjacent to the tank excavation and a pipeline trench along the southeast property boundary. The well response listed above (water levels at the beginning versus end of test at the respective distances) suggests that both the tank excavation and the pipeline trench extend in depth over at least part of their 'footprint' into the sandy silt unit or that interconnecting sand lamina or beds are present.

Because of an apparent connection between the unconfined 'aquifer' of the excavation/trench and the semi-confined aquifer of the pervasive 12-16 foot (top) sand, the aquifer thickness is assumed to be the water column length in each observation well. The apparent thickness of the

saturated materials varies from day to day, depending on the depth to the top of the saturated materials.

4.2 Water Bearing Formation Characteristics

The log-log drawdown graphs presented in Attachment A in Figure A1 to A4 are presented so that the data can be rapidly compared to available type curves. Pump test analysis theory is not strictly applicable at the pumped well and therefore will not be applied to the pumping well data (Figure A1). The hydrologic characteristics of the responding observation wells (Figure A2, MW-6 at a distance of 18.17 feet showing 1.98 feet of drawdown; Figure A3, MW-3 at a distance of 49.14 feet showing 0.15 feet of drawdown; and Figure A4, MW-8 at a distance of 65.80 feet showing 0.59 feet of drawdown) are interpreted in this section.

The distance drawdown relationship among the responding observation wells is not anticipated for a uniform isotropic aquifer system, nor for an anisotropic sand silt:

	Distance (feet)	600-minute drawdown (feet)
MW-6	18.17	1.98
MW-3	49.14	0.15
MW-8	65.80	0.59

Thus, as suggested above, the apparent anisotropy is attributed to the presence of the tank excavation and a pipeline trench along the southeast property boundary.

A dual, interconnected multi-aquifer system was being tested and consequently conventional aquifer analysis is not appropriate. Regardless, type curves contained in Kruseman, de Ridder, and Verweij (1990), Lohman (1972) and standard text references were examined to select type curves for determination of apparent transmissivity and storage coefficient.

The type curves selected for analysis of the data available from this constant rate test were those for semi-confined (leaky confined) aquifers. Full drawdown curve development from MW-3 and MW-8 would have necessitated continuing the constant rate test for a total of 12,000 minutes (8.3 days). Partial penetration effects were not considered in this analysis. Actual type curve

matching was performed using the software Graphical Well Analysis Package (GWAP, version 2.36) developed by Groundwater Graphics, Inc. of Oceanside, California.

The transmissivities calculated using the GWAP type curves matched to the suitable drawdown data are presented in Attachment B. These apparent aquifer hydraulic properties follow:

Well	Attachment B Figure	Analysis Method	Transmissivity (GPD*)/Ft.	Storage Coefficient (dimensionless)	Hydraulic Conductivity Ft/Day
MW-6	B1	Conf. Leaky, r/B =0.20	196.1	0.0016	2.85
MW-3	B2	Conf. Leaky, r/B =0.20	565.6	0.0023	7.60
MW-8	B2	Conf. Leaky, r/B =0.20	187.3	0.0030	2.45

* GPD = gallons per day

These hydraulic properties represent a combination of the hydraulics of the tank excavation and pipeline trench contributing/interacting with the semi-confined underlying sand. The hydraulic properties of the semi-confined aquifer (the sand at 12-16 foot depth at top) can only be determined after the tank excavation/pipeline trench dewaters.

The hypothetical capture zone for a pumping well is oriented upgradient. For the pumping of well MW-9 during the test 08/27/02 the capture zone would be oriented to the southeast, thus not capturing groundwater from the tank or fuel island area. Because of the apparent contribution of the unconfined tank excavation and pipeline trench during the test, the effective capture zone is the water passing from the excavation/trench to the sandy silt aquifer. Capture at a higher rate than well MW-9 is capable of being pumped 1 to 1.25 gallons per minute) can be accomplished by pumping directly from the groundwater filled excavation/trench backfill.

5.0 REFERENCES

Kruseman, G.P., N.A. de Ridder, and J.M. Verweij, 1990, Analysis and Evaluation of Pumping Test Data (Second Edition); Publication 47 of the International Institute for Land Reclamation and Improvement, Wageningen, The Netherlands.

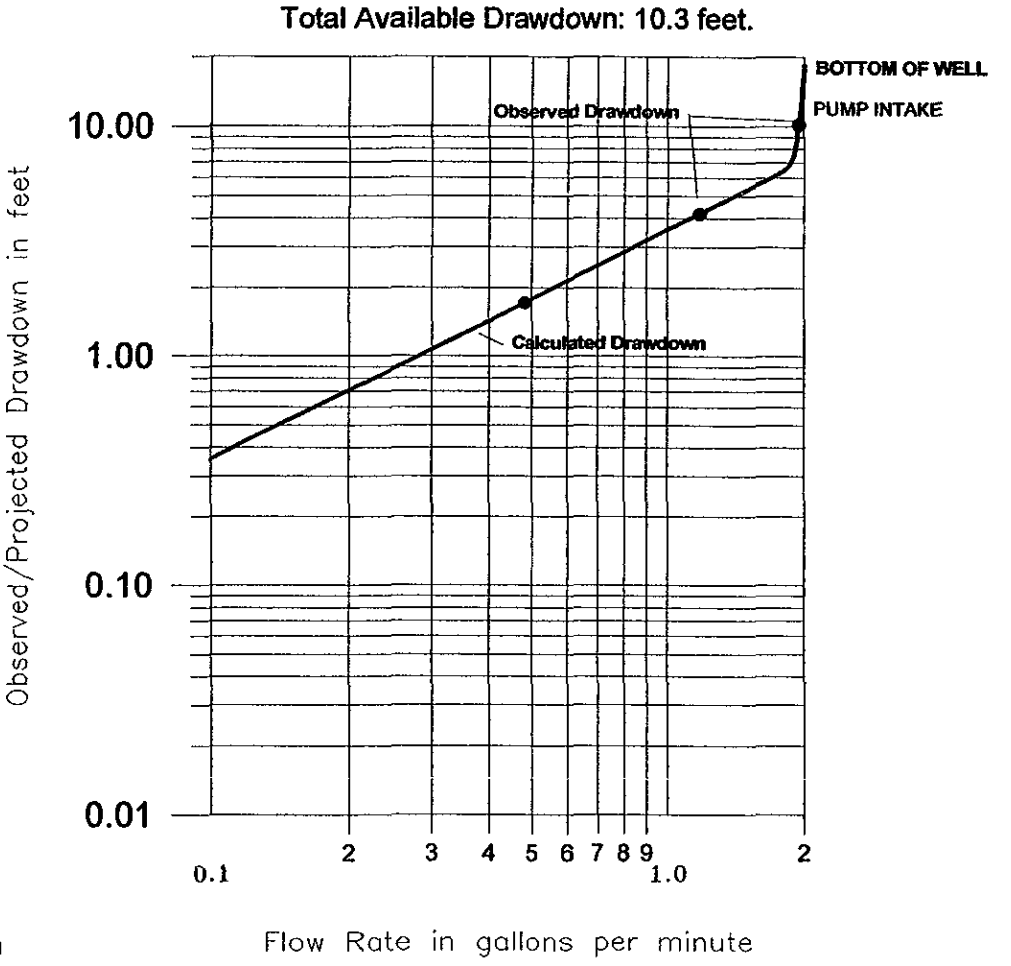
Lohman, S.W., 1972, Ground-Water Hydraulics; U.S. Geol. Survey, Professional Paper 708.

Four-inch Monitoring Well MW-9 at 8255 San Leandro Street, Oakland, Alameda County, California. Variable rate performance test performed August 08, 2002 between 10:00 and 16:00 hours. Depth to static water was 6.21 feet below casing top at 11:56 hours on 08/08/02 (6.49 feet below ground surface).

The graph below shows controlled nominal flow rates and observed drawdowns at transient condition times during the test. Projections based on the polynomial $D = BQ + CQ^P$.

D = Drawdown, feet
Q = Flow Rate, GPM
B,C,P are coefficients

For observed data:
B = 3.5623
C = 3.063E-15
P = 51.627



This test represents aquifer-well system conditions at the time it was conducted and those imposed by the equipment employed. Yield is a function of aquifer characteristics near the well, including storage features, both in the well and in the aquifer (e.g., dewatering), and the well design. Performance over time is a function of pumping-plant operation features and history, screen and filter pack condition, and groundwater/aquifer matrix geochemistry and geochemical (and biogeochemical) reactions to the change in conditions imposed by the well system. All of these factors change through time, therefore, performance will also vary over time.

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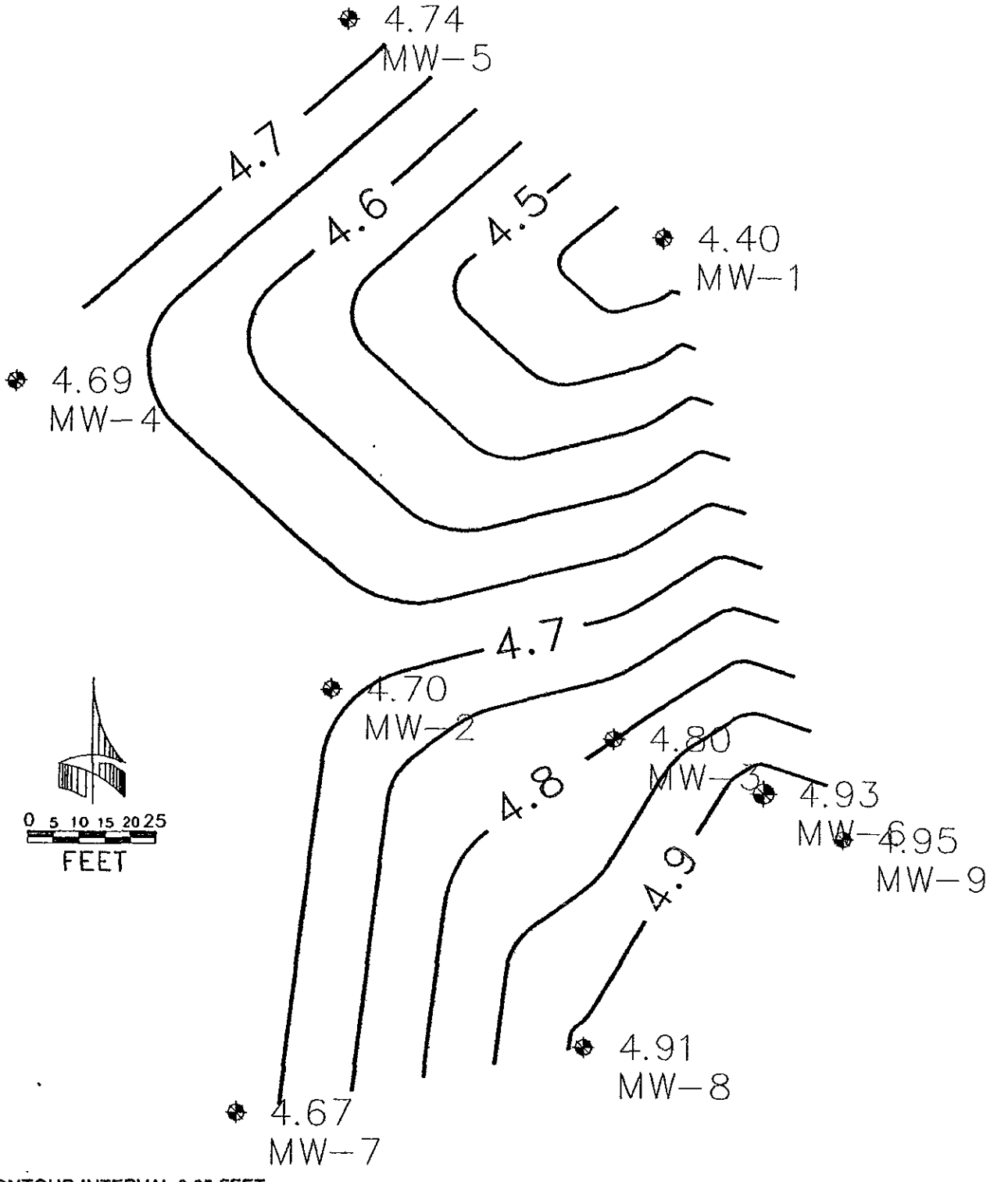
PUMPING WELL (MW-9)
STEP TEST OF AUGUST 08, 2002

8255 SAN LEANDRO STREET, OAKLAND, CALIFORNIA

FIGURE 1



CONTOUR INTERVAL 0.05 FEET.
All drawing features diagramatic. Based on well survey conducted by Mid Coast Engineers, July 2002.

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POTENTIOMETRIC SURFACE MAP - 08/27/02
BEFORE 600-MINUTE CONSTANT RATE TEST

8255 SAN LEANDRO STREET
OAKLAND, CALIFORNIA

FIGURE
2

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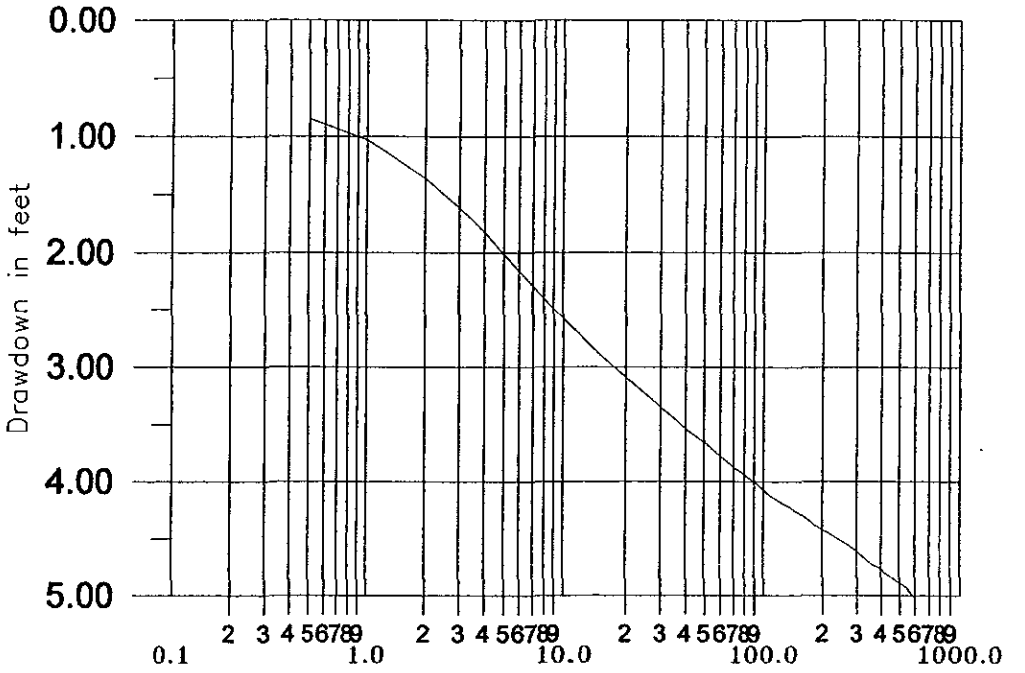
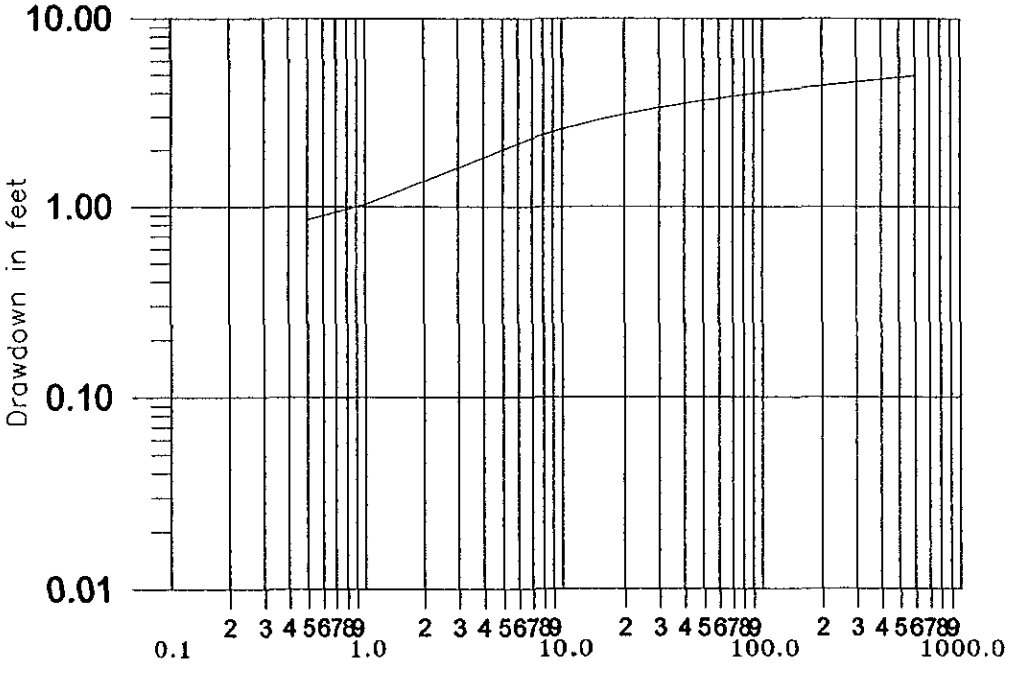
ATTACHMENT A

DRAWDOWN
PUMPING WELL MW-9
AND OBSERVATION WELLS
MW-6, MW-3, AND MW-8
DURING CONSTANT RATE TEST
AUGUST 27, 2002

8255 SAN LEANDRO STREET
OAKLAND, CALIFORNIA





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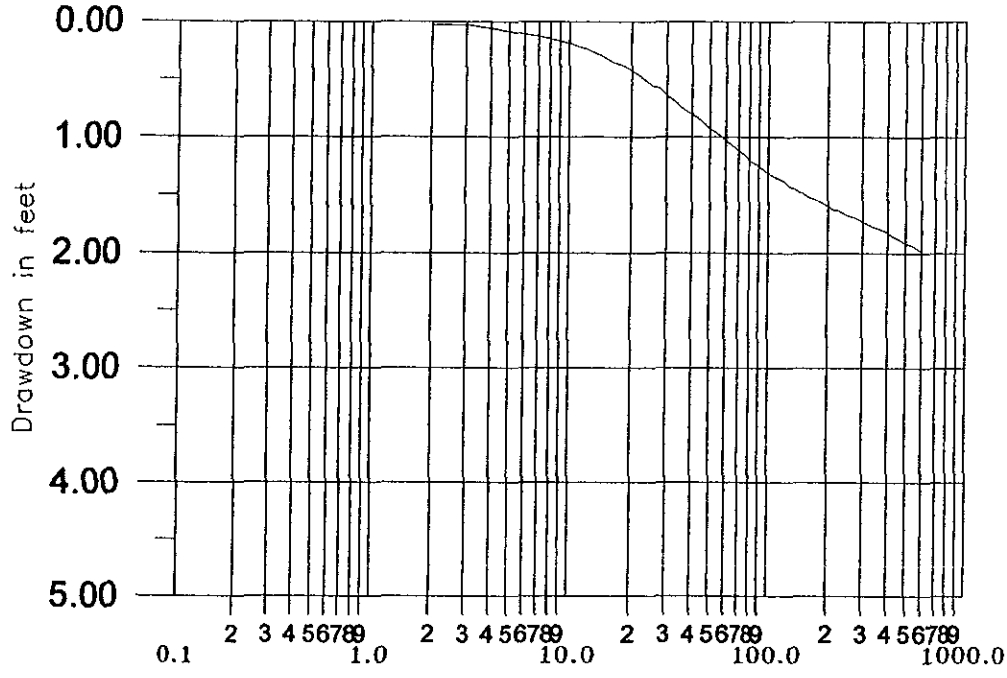
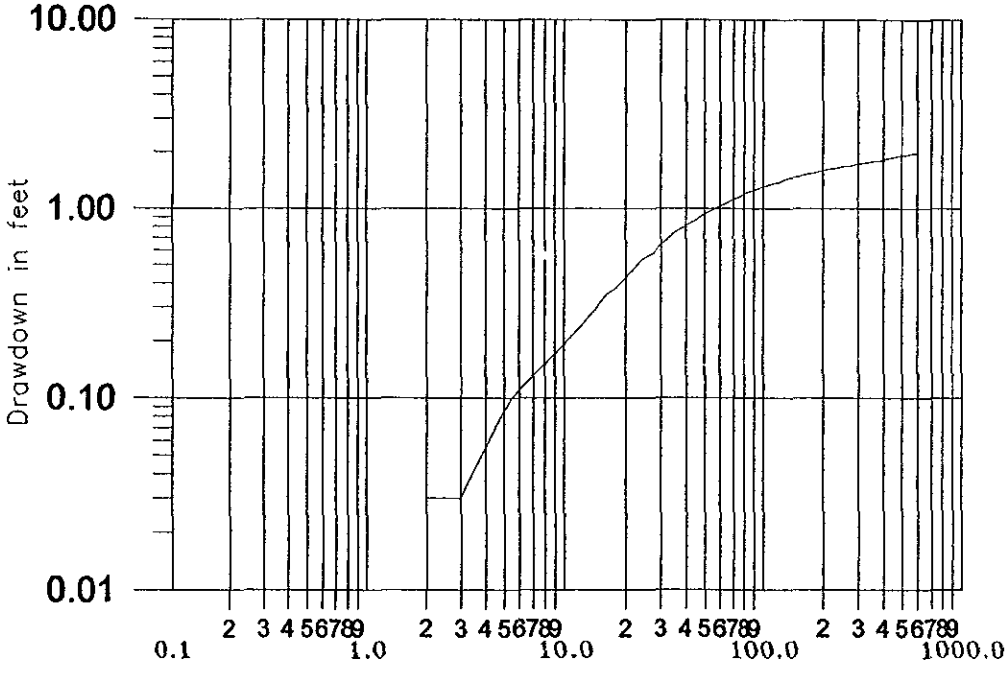
SEMILOGARITHMIC AND DOUBLE LOGARITHMIC GRAPHS OF DRAWDOWN vs. TIME PUMPING WELL (MW-9), August 27, 2002. 8255 SAN LEANDRO STREET OAKLAND, CALIFORNIA

FIGURE A1





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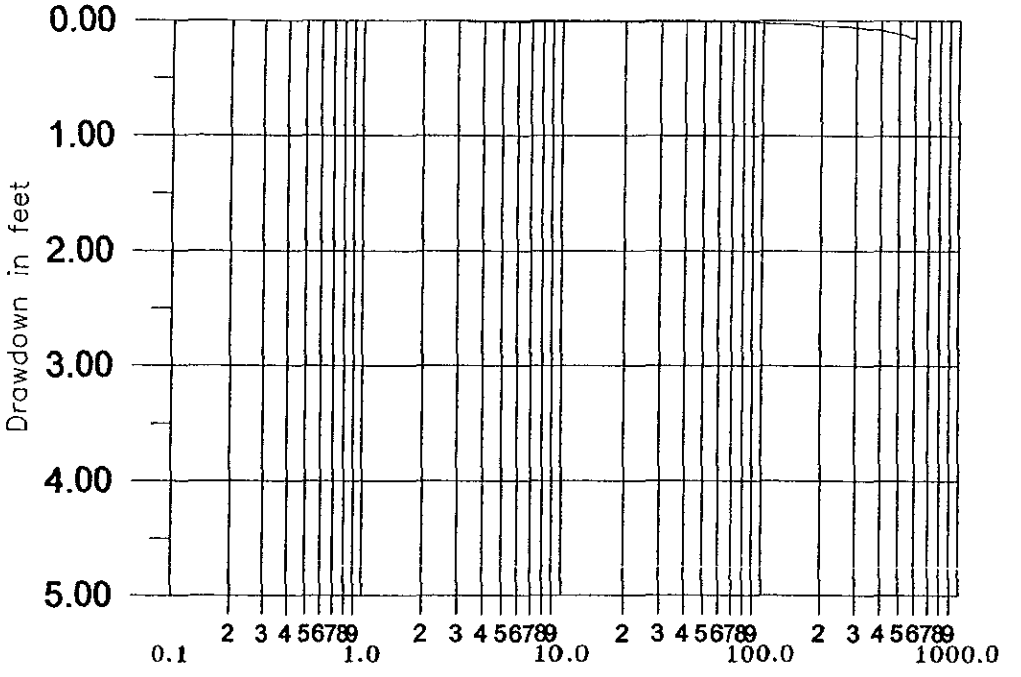
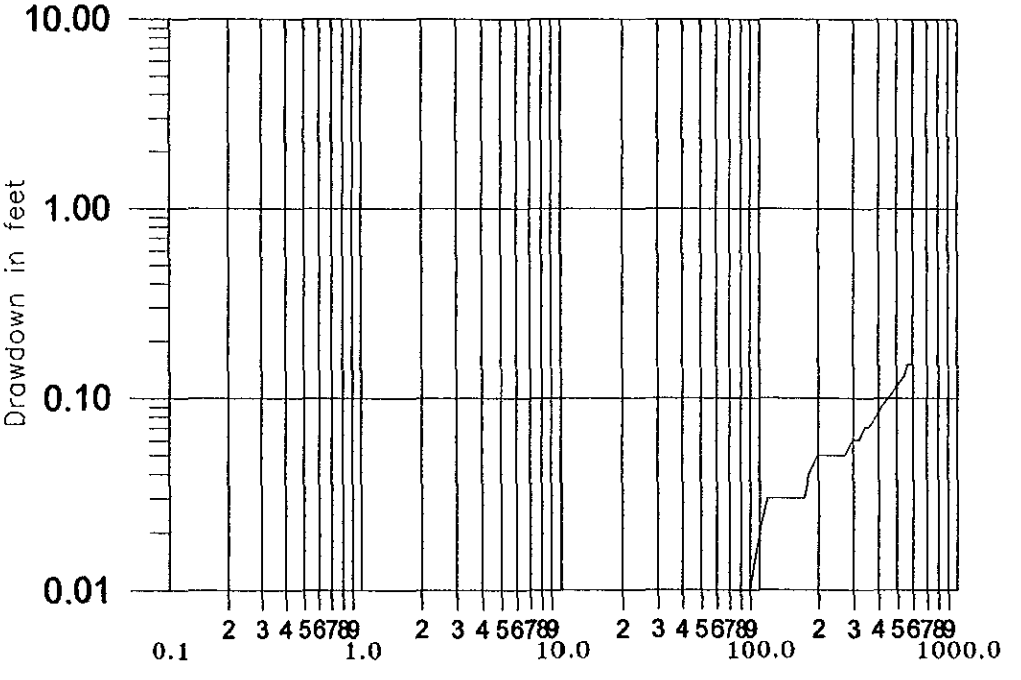
SEMILOGARITHMIC AND DOUBLE LOGARITHMIC GRAPHS OF DRAWDOWN vs. TIME OBSERVATION WELL (MW-6), August 27, 2002. 8255 SAN LEANDRO STREET OAKLAND, CALIFORNIA

FIGURE A2





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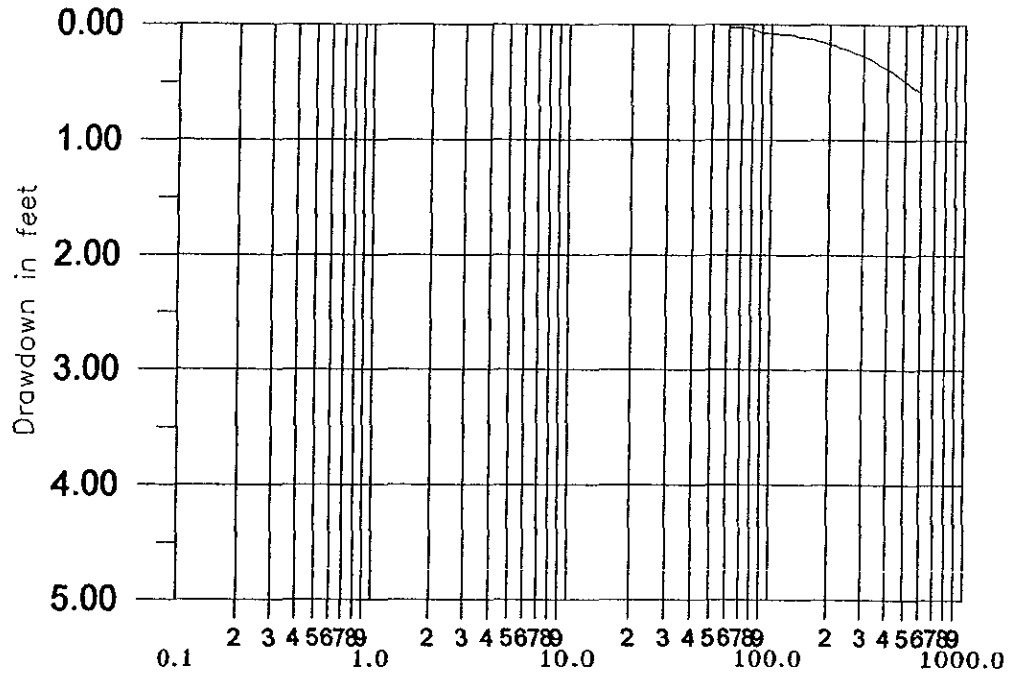
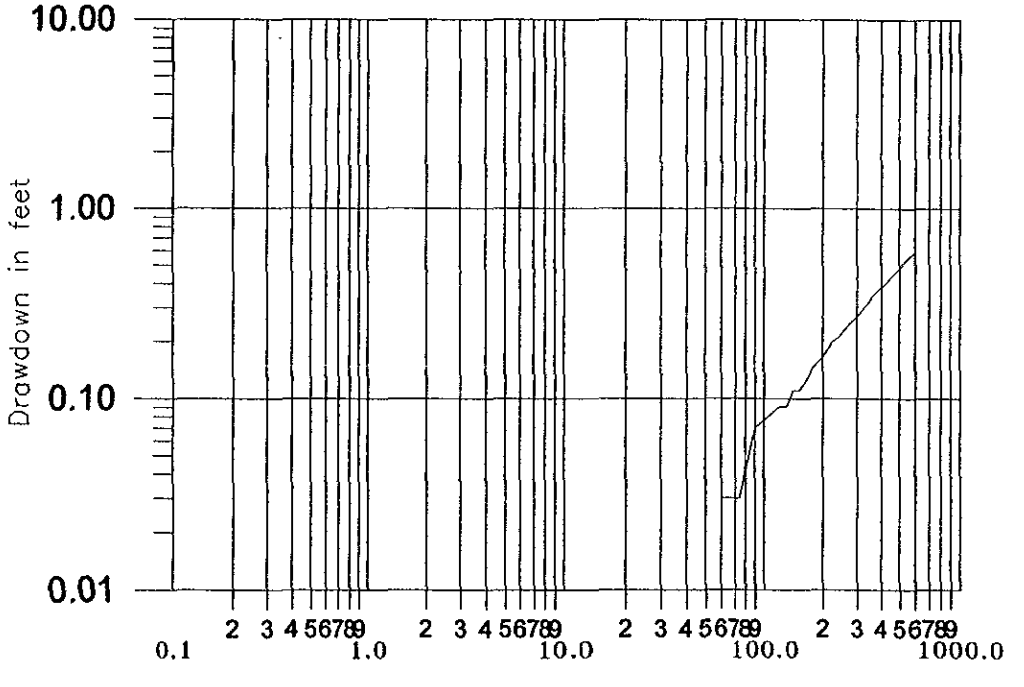
SEMILOGARITHMIC AND DOUBLE LOGARITHMIC GRAPHS OF DRAWDOWN vs. TIME OBSERVATION WELL (MW-3), August 27, 2002. 8255 SAN LEANDRO STREET OAKLAND, CALIFORNIA

FIGURE A3





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SEMILOGARITHMIC AND DOUBLE LOGARITHMIC GRAPHS OF DRAWDOWN vs. TIME OBSERVATION WELL (MW-8), August 27, 2002. 8255 SAN LEANDRO STREET OAKLAND, CALIFORNIA

FIGURE A4

TABLE A1
DRAWDOWN IN
PUMPING WELL MW-9 AND OBSERVATION WELL MW-6
PUMP TEST OF AUGUST 27, 2002
8255 SAN LEANDRO STREET
OAKLAND, CALIFORNIA

MW-9 Elapsed Time (minutes)	MW-9 Drawdown (feet)	MW-9 Elapsed Time (minutes)	MW-9 Drawdown (feet)	MW-6 Elapsed Time (minutes)	MW-6 Drawdown (feet)	MW-6 Elapsed Time (minutes)	MW-6 Drawdown (feet)
0.5	0.85	440	4.82	2	0.03	130.2	1.43
1	1.03	480	4.87	3	0.03	140	1.46
2	1.36	520	4.91	4.5	0.07	150	1.48
3	1.61	540	4.93	5.5	0.10	160	1.51
4	1.82	580	5.00	6	0.11	170	1.53
5	2.01	600	5.02	7	0.13	180	1.55
7.5	2.35			8	0.15	196	1.59
10	2.58			9	0.17	210	1.62
12.5	2.76			10	0.19	224	1.63
15	2.90			12	0.24	241	1.66
20	3.09			14	0.29	255	1.68
25	3.23			16	0.35	271.3	1.69
30	3.35			18	0.38	300	1.73
35	3.44			20	0.43	320	1.75
41	3.55			22	0.48	340	1.77
45	3.60			24	0.53	360	1.79
51	3.67			25	0.55	392	1.81
55	3.72			27.36	0.58	420	1.85
60	3.78			30.3	0.65	450	1.87
70	3.87			32.2	0.68	480	1.9
80	3.94			34	0.71	535	1.93
90	4.00			35	0.74	569	1.96
100	4.07			37.3	0.77	600	1.98
110	4.13			40.5	0.81		
120	4.17			43	0.84		
140	4.24			45	0.86		
160	4.30			50	0.93		
180	4.37			55.15	0.98		
200	4.42			60	1.03		
220	4.46			68.3	1.10		
240	4.50			70	1.11		
280	4.57			75	1.15		
300	4.61			80	1.20		
320	4.65			90	1.25		
360	4.72			100	1.31		
400	4.76			110.5	1.35		
420	4.80			120	1.38		

TABLE A2
DRAWDOWN IN
OBSERVATION WELLS MW-3 AND MW-8
PUMP TEST OF AUGUST 27, 2002
8255 SAN LEANDRO STREET
OAKLAND, CALIFORNIA

MW-3 Elapsed Time (minutes)	MW-3 Drawdown (feet)
3.3	0.01
6.45	0.01
10	0.01
16.3	0.01
25	0.01
37.3	0.01
45	0.01
60	0.01
90	0.01
100	0.02
110	0.03
120	0.03
130	0.03
140	0.03
150	0.03
160	0.03
170	0.03
180	0.04
199	0.05
211	0.05
225	0.05
242	0.05
273	0.05
299	0.06
322	0.06
341	0.07
359	0.07
393	0.08
418	0.09
449	0.10
481	0.11
536	0.13
563	0.15
601	0.15

MW-8 Elapsed Time (minutes)	MW-8 Drawdown (feet)
60	0.03
75	0.03
90	0.07
120	0.09
130	0.09
140	0.11
150	0.11
160	0.12
180	0.15
200	0.17
212	0.18
226	0.20
243	0.21
275	0.25
301	0.27
320	0.29
345	0.32
363	0.35
394	0.38
421	0.40
452	0.44
482	0.47
530	0.52
565	0.56
602	0.59

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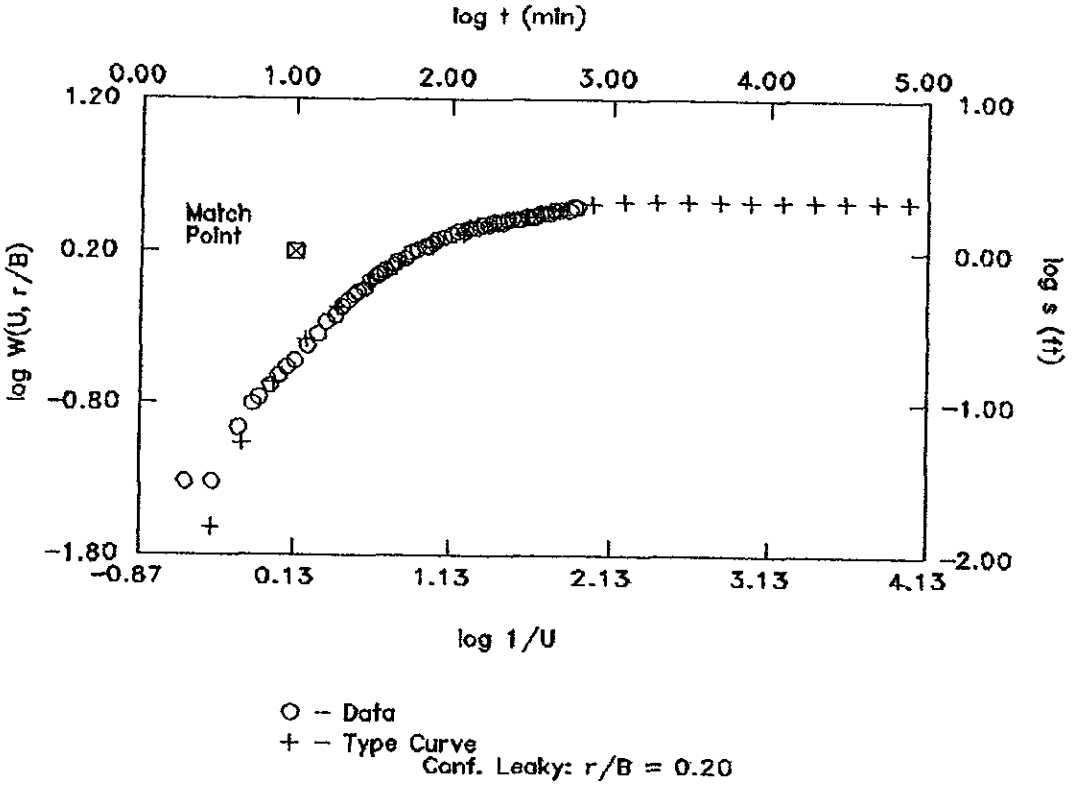
ATTACHMENT B

GRAPHICAL WELL ANALYSIS PACKAGE
TYPE CURVE MATCH TO
DRAWDOWN DATA
FROM OBSERVATION
MW-6, MW-3, AND MW-8
DURING CONSTANT RATE TEST
OF WELL MW-9
AUGUST 27, 2002

8255 SAN LEANDRO STREET
OAKLAND, CALIFORNIA

OBSERVATION WELL MW-6



MATCH POINT			SOLUTION		
t	=	1.000E+0001	Transmissivity (T)	=	1.961E+0002 gpd/ft
s	=	1.000E+0000	Hydraulic Conductivity (K)	=	2.127E+0001 gpd/sq ft
1/U	=	1.349E+0000	Storativity (S)	=	1.635E-0003
W(U, r/B)	=	1.585E+0000	Leakage Factor (B)	=	9.085E+0001 ft

WELL INFORMATION	
WELL IDENTIFICATION	: MW-6
DATE OF AQUIFER TEST	: 8/27/02
AQUIFER THICKNESS (b)	: 9.220E+0000 ft
DISCHARGE RATE (Q)	: 1.080E+0000 gpm
PUMPING WELL RADIUS (r)	: 8.330E-0002 ft
DISTANCE OF OBSERVATION WELL FROM PUMPING WELL (d)	: 1.817E+0001 ft

INTERPRETATION OF APPARENT HYDRAULIC PROPERTIES

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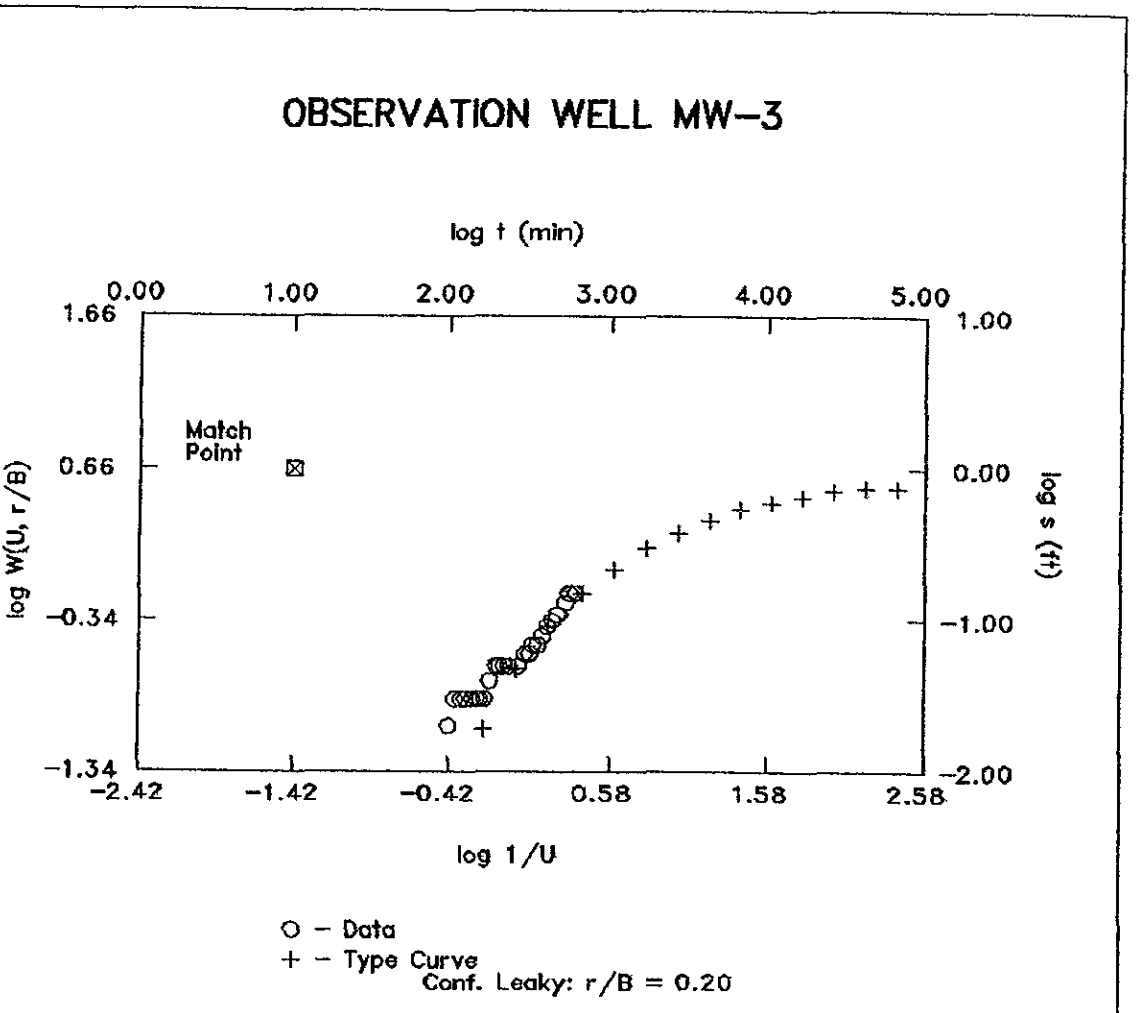
GRAPHICAL WELL ANALYSIS PACKAGE (GWAP)
DRAWDOWN INTERPRETATION
OBSERVATION WELL MW-6
600-MINUTE TEST OF WELL MW-9, AUGUST 27, 2002
8255 SAN LEANDRO STREET, OAKLAND, CALIFORNIA

FIGURE
B1



MATCH POINT			SOLUTION		
t	=	1.000E+0001	Transmissivity (T)	=	5.656E+0002 gpd/ft
s	=	1.000E+0000	Hydraulic Conductivity (K)	=	5.673E+0001 gpd/sq ft
1/U	=	3.802E-0002	Storativity (S)	=	2.288E-0002
W(U, r/B)	=	4.571E+0000	Leakage Factor (B)	=	2.457E+0002 ft

WELL INFORMATION	
WELL IDENTIFICATION	: MW-3
DATE OF AQUIFER TEST	: 8/27/02
AQUIFER THICKNESS (b)	: 9.970E+0000 ft
DISCHARGE RATE (Q)	: 1.080E+0000 gpm
PUMPING WELL RADIUS (r)	: 8.330E-0002 ft
DISTANCE OF OBSERVATION WELL FROM PUMPING WELL (d)	: 4.914E+0001 ft

INTERPRETATION OF APPARENT HYDRAULIC PROPERTIES

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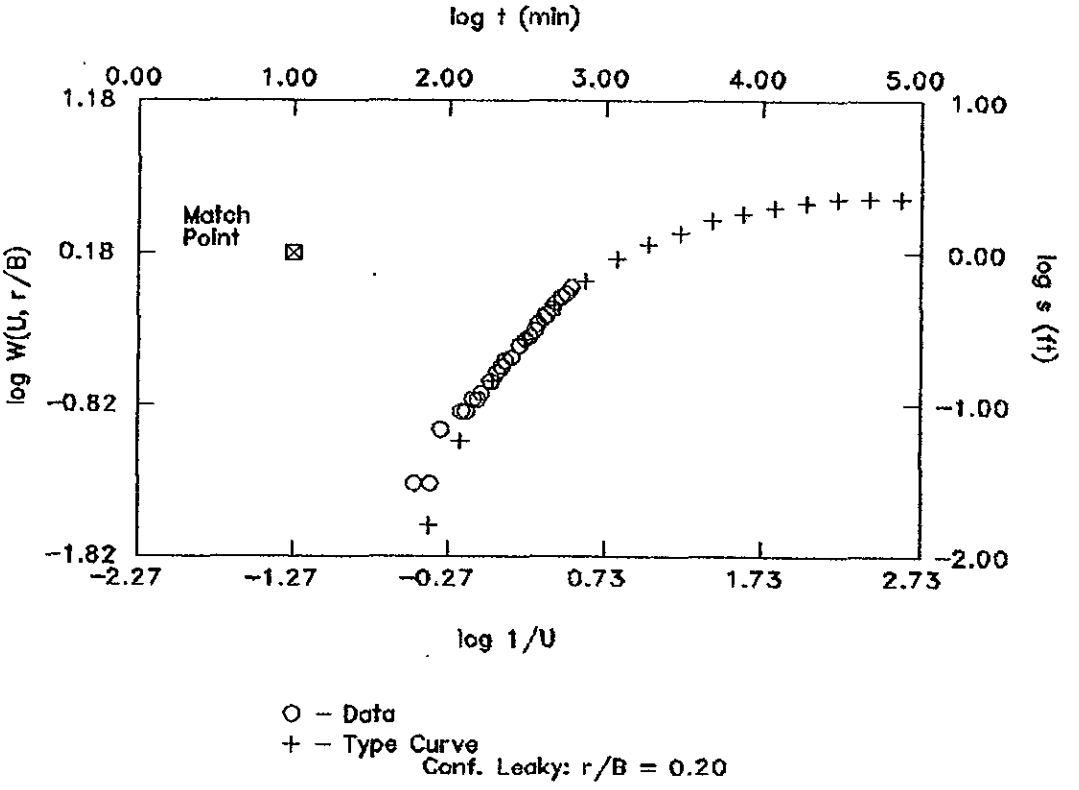
GRAPHICAL WELL ANALYSIS PACKAGE (GWAP)
DRAWDOWN INTERPRETATION
OBSERVATION WELL MW-3
600-MINUTE TEST OF WELL MW-9, AUGUST 27, 2002
8255 SAN LEANDRO STREET, OAKLAND, CALIFORNIA

FIGURE
B2

OBSERVATION WELL MW-8



MATCH POINT			SOLUTION		
t	=	1.000E+0001	Transmissivity (T)	=	1.873E+0002 gpd/ft
s	=	1.000E+0000	Hydraulic Conductivity (K)	=	1.831E+0001 gpd/sq ft
1/U	=	5.370E-0002	Storativity (S)	=	2.991E-0003
W(U, r/B)	=	1.514E+0000	Leakage Factor (B)	=	3.290E+0002 ft

WELL INFORMATION	
WELL IDENTIFICATION	: MW-8
DATE OF AQUIFER TEST	: 8/27/02
AQUIFER THICKNESS (b)	: 1.023E+0001 ft
DISCHARGE RATE (Q)	: 1.080E+0000 gpm
PUMPING WELL RADIUS (r)	: 8.330E-0002 ft
DISTANCE OF OBSERVATION WELL FROM PUMPING WELL (d)	: 6.580E+0001 ft

INTERPRETATION OF APPARENT HYDRAULIC PROPERTIES

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GRAPHICAL WELL ANALYSIS PACKAGE (GWAP)
DRAWDOWN INTERPRETATION
OBSERVATION WELL MW-8
600-MINUTE TEST OF WELL MW-9, AUGUST 27, 2002
8255 SAN LEANDRO STREET, OAKLAND, CALIFORNIA

FIGURE
B3