CLOSURE REPORT
FORMER MONARCH AIRPORT
Livermore, California

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Prepared for:

James Summers
(925)828-7999

The DeSilva Group
11555 Dublin Boulevard
Dublin, CA 94568

Prepared by:

World Environmental Services & Technology
828 Mission Street, 2nd Floor
San Rafael, CA 94901
415/460-6770 Fax 415/460-6771
main@w-e-s-t.com

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

SIGNATURE PAGE

All engineering information, conclusions, and recommendations contained in this report have been prepared by a California Professional Engineer. All hydrogeologic and geologic information, conclusions, and recommendations contained in this report have been prepared by a California Registered Geologist.

REGISTERED PROFESSIONAL ENGINEER
PETER KRASNOFF
C44031
EXP 6/30/01
CIVIL
STATE OF CALIFORNIA

Peter M. Krasnoff
California Professional Engineer (44031)

10/18/00
Date

REGISTERED GEOLOGIST
STEVEN I. MICHELSON
5165
STATE OF CALIFORNIA

Steven I. Michelson
California Registered Geologist (5165)

10-18-00
Date

1.0 INTRODUCTION

This *Closure Report* has been prepared by World Environmental Services and Technology, Inc. (WEST) for the Monarch Airport property located at 8683 Patterson Pass Road in Livermore, California ("the Site;" Figure 1). Three underground storage tanks (USTs) were removed from the Site on August 31, 1998.

Groundwater monitoring has been performed using the three monitoring wells installed near the former USTs (Figure 2). Pursuant to the request from the Alameda County Health Care Services Agency Environmental Protection Division, this report presents the results of the UST investigations and groundwater monitoring that have been performed at the Site. Based on the data and regulatory criteria, no further action regarding the release from the former USTs at the Site is recommended.

2.0 SITE DESCRIPTION

The property is the approximately 40 acre former Monarch Airport located approximately two miles south of Interstate 580 and approximately 2,000 feet northeast from the intersection of Greenville Road and Patterson Pass Road in Livermore, California (Figure 1). The former airport is not operating and the landing area is overgrown with vegetation.

Structures on the property include a house and a wooden building. The house is located in the northeastern portion of the property and approximately 700 feet east of the former USTs (Figure 2). The wooden structure is located adjacent to the former USTs in the north-central portion of the property and was part of the former Monarch Airport facilities (Figure 2). Three former USTs and a fuel pump were located adjacent to the northeastern corner of the wooden building.

2.1 UNDERGROUND STORAGE TANKS

Three USTs consisted of one 1,000-gallon tank and two 550-gallon tanks, and associated piping leading to the wooden building at the Site. The 1,000-gallon UST was reported to be empty and without visible holes. The two 550-gallon USTs and the associated product piping were reported to be empty and corroded. The former contents of the USTs are not known. However, based on the former use of the Site, it is suspected that the USTs stored aviation fuel.

2.2 GEOLOGY AND HYDROGEOLOGY

The Site is located on alluvial fan geologic materials deposited during the Quaternary. The alluvial fan geologic materials consist of silts and clays with lenses of sand and gravel (LLNL, 1998). The alluvial fan was derived from the sandstone deposits of the Neroly, Cierbo, and Green Valley Formations that support the hills to the east and south. North of the Site, the surficial geology is comprised of Pleistocene terrace deposits (USGS, 1997). The unconsolidated deposits

at the Site are at an approximate elevation of 650 feet above mean sea level and represent the eastern extent of the Livermore Valley.

Groundwater for the region primarily occurs beneath the alluvial materials and in the upper and lower blue sandstone units of the Neroly Formation and in the underlying Cierbo Formation. Groundwater can also be present in permeable Quaternary alluvium valley fill (Qal) during the winter rainy season (LLNL, 1998). The perched water-bearing zones primarily occur in the unconsolidated

2.3 GROUNDWATER ELEVATION AND GRADIENT

Three monitoring wells (MWT-1, MWT-2, MWT-3) were installed at the Site in 1989 by Wahler and Associates (Figure 2). Depth to groundwater was measured in three monitoring wells during the four monitoring activities conducted in March 1997 and February, August, and November 1999. The elevation of the top of casing of the monitoring wells was surveyed in May 2000 by Ruggeri, Jensen, Azar & Associates of Pleasanton, California.

Based on the depth to groundwater measurements and the elevation of the monitoring wells, the groundwater elevations measured at the Site have ranged from a low of 615.12 feet above mean sea level (MSL) in MWT-1 during March 1997 and a high of 619.5 feet MSL in MWT-3 during February 1999. Based on the depth to water measurements, the groundwater elevation appears to have fluctuated upwards by approximately 2 feet between March 1997 and February 1999.

? northwest

Based on the groundwater elevation, the groundwater gradient is towards the northeast at an approximate magnitude of 0.054 feet per foot. Based on the four groundwater monitoring events, the groundwater gradient direction and magnitude appear to be seasonally stable. Figure 3 depicts the groundwater potentiometric surface based on depth to groundwater measurements recorded in November 1999. A summary of the groundwater elevation data is presented on Table 1.

other water supply wells should not be impacted by the plume originating from this site.

2.4 GROUND WATER BENEFICIAL USES

The California Regional Water Quality Control Board – San Francisco Bay ("Regional Board") Water Quality Control Plan ("Basin Plan," 1995) indicates that the existing beneficial uses of groundwater within the Livermore Valley Basin include municipal, domestic, industrial, and agricultural supply.

2.4.1 Well Survey

A review of the Site was conducted to identify potential water supply wells at the Site. A domestic water supply well and storage tank was identified on the northern property boundary, approximately 600 feet west from the former USTs (Figure 2). WEST also requested information from the Alameda County Flood Control & Water Conservation District Zone 7 database. The results of the database search revealed two domestic supply wells, one industrial supply well, and one irrigation well located within 3,000 feet of the Site.

The domestic supply well, noted above, was identified as 3S/3E-6N1 and was located 600 feet west from the former USTs, and was reportedly an 8-inch diameter well with a total depth of 136 feet. The Alameda County Flood Control & Water Conservation District Zone 7 has identified this well as having been destroyed.

The domestic supply well 3S/2E-1J3 is located approximately 2,800 feet northwest, downgradient form the former USTs, and is reportedly a 5-inch diameter well with a total depth of 160 feet. The industrial supply well 3S/2E-1J1 is located approximately 2,800 feet northwest, downgradient of the Site, and is reportedly an 8-inch diameter well with a total depth of 124 feet. The irrigation well 3S/3E-7D1 is reportedly a 12-inch diameter well with a total depth of 400 feet, and is located approximately 2,000 feet south-southwest and cross-gradient from the site. The well survey is summarized in Table 4 and a copy of the map and database information provided by Alameda County Flood Control & Water Conservation District Zone 7 is included in Appendix A.

3.0 SITE CHARACTERIZATION

Consistent with the requirements of California Code of Regulations, Title 23 Waters, Division 3, Water Resources Control Board, Chapter 16 Underground Storage Tank Regulations, a series of site investigations have been performed to assess the nature, vertical and lateral extent of the release, and to evaluate a cleanup requirements.

The initial investigation of releases from the USTs was performed by Wahler Associates (Wahler) in 1989. Three monitoring wells were installed by Wahler in 1989 in the vicinity of the former USTs (Figure 2). Wahler reported up to 1,700 mg/kg of total petroleum hydrocarbons as gasoline (TPHg) in soil samples collected during their 1989 investigation (Kleinfelder, 1997). Wahler also installed a fourth monitoring well on the southwest portion of the property to evaluate potential impacts from off-site releases to groundwater, i.e., Lawrence Livermore National Laboratory (LLNL).

Kleinfelder collected samples of groundwater from the existing monitoring wells for analysis of petroleum hydrocarbons. Subsequently in 1997, Kleinfelder advanced five borings and collected nine soil samples and three groundwater samples from the vicinity of the USTs.

In 1998, Pacific States Environmental Contractors, Inc. of Dublin, California (PSEC) removed the three USTs. PSEC also performed confirmation soil sampling in the UST excavation (PSEC, 1998). In 1999, groundwater monitoring was performed in the three monitoring wells at the Site. Chromalab, a state certified analytical laboratory, performed the chemical analyses of samples collected in 1997 and 1999. Copies of the laboratory certificates, chain-of-custody, and field data sheets for groundwater monitoring performed in 1999 are included in Appendix B. A summary of the site investigations is presented below.

3.1 SITE INVESTIGATIONS

Collection and laboratory analysis of soil and groundwater samples were performed in 1997 by Kleinfelder, and soil samples were collected in 1998 by PSEC in association with the removal of the USTs. The following summarizes the soil and groundwater investigations performed at the Site.

3.1.1 Soil Investigations

Eleven soil samples were collected from five soil borings (KB1 through KB5) advanced at the Site by Kleinfelder (Figure 2). The borings ranged in depth from 20 feet to 45 feet below ground surface (bgs). Nine soil samples were analyzed for total petroleum hydrocarbons in the motor oil, kerosene, diesel, and gasoline ranges (TPHmo, TPHk, TPHd, and TPHg) using EPA Method 8015, for the gasoline related compounds benzene, toluene, ethyl benzene, and xylenes (BTEX) and methyl tertiary butyl ether (MTBE) using EPA Method 8020, and for total lead using EPA Method 6010. Two of the soil samples were analyzed for pH and moisture content. The soil analytical results are summarized on Table 2.

The laboratory analyses revealed detectable concentrations of TPHd in three of the eleven soil samples, at 4.4 milligrams per kilogram (mg/kg) in the sample collected from 40 feet bgs in soil boring KB2, and at 1.1 mg/kg in the samples collected from 5 feet and 25 feet bgs in soil boring KB5. However, the concentrations of TPHd reported in these soil samples may not be related to petroleum hydrocarbons because the laboratory indicated that the TPHd did not match their diesel standard. Petroleum hydrocarbons in the motor oil and kerosene ranges, MTBE, and total lead were not reported in the other soil samples above the detection limits of 50 mg/kg, 1.0 mg/kg, 0.0050 mg/kg, and 5.0 mg/kg, respectively (Table 2).

Of the eleven soil samples, only the soil sample collected from 35 feet bgs in KB1 revealed TPHg, toluene, ethyl benzene, and xylenes, at 140 mg/kg, 1.8 mg/kg, 1.6 mg/kg, and 6.7 mg/kg, respectively. Benzene and MTBE were not reported in soil samples collected at the Site above

the detection limit of 0.12 mg/kg and 0.62 mg/kg. The moisture content in the soil samples was reported to range from 15.0 to 19.4 percent and pH ranged from 7.1 to 7.89 Standard Units (S.U.).

3.1.2 UST Removal Soil Sampling

Following removal of the USTs from the excavation in August 1998, PSEC collected two soil samples (1A and 2A) from beneath the 1,000-gallon UST and two soil samples (3A and 4A) from beneath the two 550-gallon USTs. One soil sample (1C) was collected in the vicinity of the fuel pump. Four soil samples 1B, 2B, 3B and 4B were collected from the excavated soil stockpile and were composited into one sample by the analytical laboratory for analysis. The soil samples were analyzed for TPH as aviation gas (TPHag) using EPA Method 8015 and for BTEX and MTBE using EPA method 8020. The soil sample 1C was also analyzed for total lead using EPA Method 6010.

The five soil samples and one composite soil sample did not reveal concentrations of TPHag, BTEX, or MTBE above the detection limits of 1.0 mg/kg, 0.0050 mg/kg, and 0.0050 mg/kg, respectively. Lead was reported at a concentration of 77 mg/kg in the soil sample 1C. The analytical results for soil samples collected at the Site are summarized on Table 2.

3.1.3 Groundwater Investigations

Three monitoring wells MWT-1, MWT-2, and MWT-3 were installed by Wahler in 1989 in the vicinity of the former USTs (Figure 2). A fourth monitoring well, MW-4, was installed in1989 to evaluate the potential of off-site releases to groundwater at the Site. Groundwater samples were collected by Kleinfelder from the four monitoring wells and from three soil borings.

3.1.3.1 MONITORING WELL SAMPLING

Groundwater samples were collected by Kleinfelder on March 26, 1997 from MWT-1, MWT-2, and MWT-3 and were analyzed for TPHmo, TPHk, TPHd and TPHg using EPA Method 8015, for BTEX and MTBE using EPA Method 8020, and for total lead using EPA Method 6010.

Groundwater samples collected from the three monitoring wells did not reveal concentrations of TPHmo, TPHk, TPHd, or MTBE above the detection limit of 500 µg/l, 50 µg/l, 50 µg/l, and 0.5 µg/l, respectively. TPHg was not reported above the detection limit of 50 µg/l in groundwater samples collected from MWT-1 and MWT-3. TPHg was reported in MWT-2 at 5,400 µg/l.

The groundwater collected from MWT-2 revealed benzene at 20 µg/l, toluene at 22 µg/l, ethyl benzene at 370 µg/l, and xylenes at 890 µg/l. Groundwater sampled from MWT-3 revealed 2 µg/l of ethyl benzene and 1 µg/l of xylenes. BTEX was not reported above the detection limit in MWT-1. Total lead was measured in unfiltered groundwater samples from the three monitoring wells up to 0.017 mg/l in MWT-1.

Monitoring well MW-1 was also sampled on March 26, 1997. The sample was analyzed for volatile organic compounds (VOCs) by EPA Method 8260 and semi-volatile organic compounds (SVOCs) by EPA Method 8270. The laboratory analyses did reveal the presence of VOCs or SVOCs above their reporting detection limits. Table 3 presents a summary of the groundwater analytical data.

3.1.3.2 GRAB GROUNDWATER INVESTIGATION

Three grab groundwater samples were collected by Kleinfelder on March 31 and April 1, 1997 from the three soil borings KB1, KB2, and KB4, prior to removal of the USTs. Boring KB1 was located downgradient from the former USTs and borings KB2 and KB4 were located cross-gradient and upgradient from the USTs, respectively (Figure 2). These grab groundwater samples

were analyzed for TPHmo, TPHk, TPHd, and TPHg using EPA Method 8015, for BTEX and MTBE using EPA Method 8020, and for total lead using EPA Method 6010.

The three grab groundwater samples revealed TPHd above the detection limit at 64 micrograms per liter (µg/l) in KB1, 180 µg/l in KB2, and 80 µg/l in KB4. However, the laboratory indicated that the results did not match the pattern of their diesel standard. Based on the chromatogram, it was concluded that the patter appears closer to aviation fuel.

The grab groundwater samples KB1 and KB2 revealed TPHg at 220 µg/l and 66 µg/l, respectively. The BTEX compounds were also reported in these two samples, with the highest concentrations reported in KB1 at 2.1 µg/l of benzene, 0.93 µg/l of toluene, 16 µg/l of ethyl benzene, and 51 µg/l of xylenes. The grab groundwater sample collected from KB4 did not reveal the BTEX compounds above the detection limit of 0.50 µg/l. MTBE was not reported above the detection limit of 50 µg/l in the three grab groundwater samples. Total lead was reported in the three unfiltered grab groundwater samples ranging up to 0.25 milligrams per liter (mg/l) in KB4. The groundwater analytical results are summarized on Table 3.

3.1.3.3 DOMESTIC SUPPLY WELL SAMPLING

In March 1997, a water sample was collected by Kleinfelder from the domestic water supply well located in the vicinity of the house located on the property. Analysis of the sample for volatile organic compounds in drinking water by EPA Method 502.2 did not reveal BTEX above the detection limit of 0.50 µg/l or other chemicals above detection limits ranging from 0.5 µg/l to 5.0 µg/l.

3.2 GROUNDWATER MONITORING

Consistent with the State UST requirements, groundwater monitoring has been performed using the existing wells at the Site. Groundwater samples were collected from three monitoring wells at the Site during four separate groundwater monitoring events in March 1997 and in February,

August, and November 1999. Groundwater monitoring was conducted by PSEC on February 3, 1999, and by Environmental Sampling Services of Martinez, California (ESS) on August 27, 1999 and November 19, 1999. Copies of the laboratory certificates, chain-of-custody, and field data sheets for groundwater monitoring performed in 1999 are included in Appendix B. The following describes the groundwater monitoring results.

3.2.1 1st Quarter 1999

Groundwater samples were collected by PSEC from the three monitoring wells at the Site on February 3, 1999. The groundwater samples were collected following purging of the monitoring wells with a bailer. The groundwater samples collected in February 1999 were analyzed for TPHd and TPHg by EPA Method 8015, BTEX by EPA Method 8020, 1,2-dichloroethane (1,2 DCA) using EPA 8010, and lead following filtering in the laboratory by EPA Method 6010.

The groundwater sample collected from MWT-2 revealed 13,000 µg/l of TPHg, 220 µg/l of benzene, 110 µg/l of toluene, 2,200 µg/l of ethyl benzene, and 2,800 µg/l of xylenes. The groundwater samples collected from MWT-1 and MWT-3 did not reveal TPHg or BTEX above the detection limits of 50 µg/l and 0.50 µg/l, respectively.

The groundwater samples collected from the three monitoring wells revealed TPHd at 110 µg/l in MWT-1, 960 µg/l in MWT-2, and 94 µg/l in MWT-3. However, the concentrations of TPHd reported in these groundwater samples may not be related to petroleum hydrocarbons because the laboratory indicated that the TPHd did not match their diesel standard.

Dissolved lead and 1,2 DCA were not reported in the groundwater samples collected from the three monitoring wells above the detection limits of 0.0050 mg/l and 0.50 µg/l, respectively. Table 3 presents a summary of the groundwater analytical data.

3.2.2 3rd Quarter 1999

Groundwater samples were collected from the three monitoring wells by ESS on August 27, 1999. The groundwater samples were collected following purging of the monitoring wells with a bailer. The groundwater samples collected in August 1999 were analyzed for TPHd and TPHg using EPA Method 8015, and for BTEX using EPA Method 8020.

The groundwater sample collected from MWT-2 revealed 280 µg/l TPHd, 5,000 µg/l TPHg, 110 µg/l benzene, less than 0.50 µg/l toluene, 450 µg/l ethyl benzene, and 400 µg/l xylenes. The groundwater samples collected from MWT-1 and MWT-3 did not reveal TPHd, TPHg, or BTEX above the detection limits of 50 µg/l, 50 µg/l and 0.50 µg/l, respectively (Table 3).

3.2.3 4th Quarter 1999

Groundwater samples were collected from the three monitoring wells by ESS on November 19, 1999. The groundwater samples were collected following purging of the monitoring wells with a bailer. The groundwater samples collected in November 1999 were analyzed for TPHd and TPHg using EPA Method 8015, for BTEX and MTBE using EPA Method 8020.

The groundwater sample collected from MWT-2 revealed 230 µg/l TPHd, 8,100 µg/l TPHg, 180 µg/l benzene, less than 0.50 µg/l toluene, 780 µg/l ethyl benzene, and 1,000 µg/l xylenes. The groundwater sample collected from MWT-3 revealed 86 µg/l TPHg, and the laboratory characterized the result as not matching their gasoline standard. Concentrations of TPHd, MTBE and BTEX were not detected in the groundwater samples collected from MWT-1 or MWT-3 above the detection limits of 50 µg/l, 5.0 µg/l, and 0.50 µg/l, respectively. TPHg was not reported in the groundwater sample collected from MWT-1 above the detection limit of 50 µg/l (Table 3). Figure 4 presents the analytical results of groundwater samples collected at the Site on November 19, 1999.

4.0 APPLICABLE CLEANUP GOALS

Based on the detection of petroleum hydrocarbons in groundwater at the Site, an assessment has been performed to evaluate the potential risk to human health and to the beneficial use of groundwater. The State Water Resources Control Board (State Board) characterizes petroleum hydrocarbon sites as "low risk" when the maximum depth to ground water is less than 50 feet and when there are no drinking water wells within 250 feet from the source area (December, 1995). The conditions at the Site are consistent with the "low risk" established by the State Board. The State Board recommends that "risk based corrective measures" be evaluated for "low risk" sites.

4.1 RISK BASED EXPOSURE EVALUATION

An evaluation has been performed to identify potential exposure pathways at the Site based on the location and distribution of the affected soils and groundwater, land use, concentrations of petroleum hydrocarbons in soil and groundwater, and the distance and direction to the nearest drinking water well. Table 5 presents a summary of the exposure scenarios that have been considered in the screening evaluation of risks for this Site, which include inhalation of indoor and outdoor air potentially containing vapors emanating from soil and groundwater, ingestion of soil and groundwater, and dermal contact with soil and groundwater, and potential impacts of soil leachate to groundwater beneficial uses.

The Site is currently vacant and the exposure pathways to humans are currently incomplete. However, future land use could reasonably include residences. Based on current Site use and data characterizing soil quality, there are no complete exposure pathways to soil containing measurable concentrations of TPH or BTEX. Although the indoor air inhalation pathway could become complete under a future residential land use scenario, petroleum hydrocarbons in groundwater naturally remediate over time as a result of biodegradation and other attenuation processes (LLNL, 1995).

Consistent with Regional Board guidance, the groundwater ingestion pathway was not considered because the impacted groundwater is not currently used as a source of drinking water or projected to be used within the life of the plume (Regional Board, January 1996). In addition, there currently exist institutional controls that would preclude the construction of water supply wells within the zone of groundwater currently affected with petroleum hydrocarbons. The California Well Standards Bulletin 74-90 restricts the construction of water supply wells within the upper 50 feet at a contaminated site. In addition, construction of water supply wells without the approval of the regulatory agency is not allowed (California Department of Water Resources, 1991). Therefore, these institutional controls credibly sever the groundwater ingestion exposure pathway at the Site. Based on current land use and the institutional control provided by California Department of Water Resources (DWR), the ingestion exposure pathway at the Site is considered to be incomplete.

4.2 RISK BASED SCREENING LEVELS

An evaluation of the potential human health risk at the Site has been performed by comparing the concentrations of chemicals measured in soil and groundwater at the Site with risk based screening levels (RBSLs). The California Regional Water Quality Control Board – San Francisco Bay ("Regional Board") has identified Tier 1 risk based screening levels (RBSLs) (Regional Board, August 2000). The Regional Board RBSLs "are considered to be very conservative [and] the presence of a chemical at concentrations below the corresponding RBSL can be assumed to not pose a significant threat to human health and the environment." While a chemical may be measured at concentrations above the Regional Board RBSL, it "does not necessarily indicate that adverse impact to human health or the environment are occurring, [it] simply indicates that potential for adverse impacts may exist and that additional evaluation is warranted."

In developing the RBSLs, the Regional Board has considered exposure pathways to humans, such as dermal contact and inhalation, migration of soil leachate to groundwater, and urban area eco-toxicity criteria. The Regional Board used a depth of 3 meters (10 feet) to delineate between

surface soil and subsurface soil. The Regional Board RBSLs for surface soil in residential land use areas where groundwater is a potential drinking water resource have been used to evaluate the concentrations of chemicals measured at the Site (Table 5).

4.2.1 Soil RBSL Evaluation

Potential exposure pathways to COCs in soil at the site consist of volatilization of COCs in soil to indoor and outdoor air, ingestion of soil, dermal contact with soil, inhalation of soil, and migration of soil leachate to groundwater. The soil samples collected at the Site indicate that the depth to detectable concentrations of COCs in soil is approximately 35 feet bgs. The BTEX concentrations within the soil sample collected from 35 feet bgs in KB1 are below the depth considered to be surface soil and are within the saturated zone (Regional Board, August 2000). The exposure pathways to soil appear to be incomplete, therefore, there does not appear to be a significant risk associated with soil (Table 5).

4.2.2 Groundwater RBSL Evaluation

Potential exposure pathways to COCs in groundwater at the Site consist of volatilization of COCs in groundwater to indoor and outdoor air and ingestion of groundwater. These potential exposure pathways were evaluated using the Regional Board RBSLs (August 2000). RBSLs for inhalation of indoor and outdoor air associated with BTEX in underlying groundwater are 5,800 µg/l for benzene, and the solubility threshold for toluene, ethyl benzene, and xylenes. These RBSLs are based on the geology of the Site containing fine-grained soils between ground surface and groundwater.

The reasonable maximum exposure (RME) concentrations of BTEX in groundwater at the Site were calculated using the most recent data from the three monitoring wells and hydropunch locations. The RME was calculated as the 95 percent upper confidence level of the arithmetic mean of the data. The RMEs for BTEX in groundwater at the Site are below the indoor air

inhalation RBSLs for BTEX in groundwater. Based on this evaluation, groundwater does not appear to pose a significant risk to human health.

5.0 SUMMARY OF FINDINGS

The property consists of approximately 40 flat acres of open field and was formerly operated as the Monarch Airport. The Site consists of three former USTs and associated piping that were located adjacent to the northeast corner a wooden building. The Site is currently vacant and the airport landing area is overgrown with vegetation. The groundwater gradient at the Site is oriented towards the northwest at approximately 0.054 feet per foot. The nearest water supply well is approximately 600 feet to the west.

Based on the criteria identified by the State Water Resources Control Board (December, 1995) this Site can be characterized as "low risk," i.e., shallow ground water with maximum depth to water less than 50 feet and no drinking water wells within 250 feet from the leak. Based on these criteria, the State Board recommends that low risk sites be closed and natural attenuation processes be used to address residual concentrations.

Pursuant to the SWRCB guidance, the Site has been evaluated to determine whether the Site should be closed as a low risk groundwater case. A summary of the evaluation and findings are presented below.

5.1 SOURCE REMOVED OR REMEDIATED

The USTs were removed in 1998. Soil sampling conducted at the time of the tank removal indicated non-detectable concentrations. Therefore, potential source materials containing petroleum hydrocarbons had been removed.

5.2 SITE ADEQUATELY CHARACTERIZED

The soil quality data indicate that the distribution of measurable concentrations of petroleum hydrocarbons is laterally limited to the vicinity of the former USTs and vertically limited to depths near groundwater. Analysis of three grab groundwater samples collected in March 1997, prior to

the removal of the USTs, revealed TPHg and BTEX in borings KB1 and KB2, which were located down-gradient and cross-gradient from the former USTs. The grab groundwater sample collected from boring KB4, up-gradient from the former USTs, did not reveal petroleum hydrocarbons above the detection limit.

Groundwater samples collected from monitoring well MWT-1, located further down-gradient from the former USTs, and monitoring well MWT-3, located up-gradient from the former USTs, have not revealed concentrations of TPHg or BTEX above the detection limit during the three sampling events in 1999.

5.3 DISSOLVED PLUME IS STABLE

The four groundwater monitoring events performed between March 1997 and November 1999 consistently revealed TPH and BTEX below or near the detection limit of 50 mg/l and 5.0 µg/l, respectively, in monitoring well MWT-1, located approximately 30 feet down-gradient from the former USTs, and in monitoring well MWT-3, located up-gradient from the former USTs. Groundwater samples from MWT-2, located in the immediate vicinity of the former USTs, have revealed detectable concentrations of TPHg and BTEX. Based on the groundwater monitoring analytical results, measurable concentrations of TPHg and BTEX in groundwater appear to be limited to the immediate vicinity of the former USTs.

MWT-2, which is located in the immediate the vicinity of the former USTs has revealed fluctuating concentrations of petroleum hydrocarbons. Groundwater samples collected from MWT-2 revealed concentrations of TPHg at 5,400 µg/l in March 1997, 13,000 µg/l in February 1999, 5,000 µg/l in August 1999, and 8,100 µg/l in November 1999. While the concentrations fluctuate, a review of groundwater elevation data reveals that the increases are associated with increases in groundwater elevation. Based on the data it appears that the increase in groundwater elevation is bringing the groundwater into contact with a "smear" zone of petroleum hydrocarbon soil near the groundwater table. Therefore, fluctuations in concentrations of petroleum

hydrocarbons in groundwater are not indicative of plume instability, but are related to changes in groundwater elevation. Fluctuations in groundwater elevation and petroleum hydrocarbons concentration are depicted on Graphs 1, 2, and 3 (Appendix C).

5.4 NO SENSITIVE RECEPTORS LIKELY TO BE IMPACTED

No water wells, deeper drinking water aquifers, surface water, or other sensitive receptors are likely to be impacted. The extent of groundwater contamination has been delineated. The nearest potential sensitive receptor is the existing potable water well located approximately 2800 feet from the release.

5.5 NO SIGNIFICANT RISK TO HUMANS

Based on an evaluation of potential exposure pathways, risk-based screening levels (RBSLs), and reported concentrations of petroleum hydrocarbons at the Site, there does not appear to be a significant risk to humans.

5.5.1 No Significant Risk from Soil

Only one soil sample revealed concentrations of petroleum hydrocarbons above the laboratory detection limits. The soil sample was collected from soil boring KB1 from 35 feet bgs in boring KB1 and prior to the removal of the USTs. Concentrations of COCs in this soil sample were below the ASTM Tier 1 RBSLs and the Regional Board RBSLs. Based on these data, soil conditions at the Site are considered to not pose significant level of risk to human health under current or reasonable potential future land use scenarios.

5.5.2 No Significant Risk from Groundwater

Groundwater samples yielding measurable concentrations of COCs in 1999 are limited to those collected from MWT-2, located immediately adjacent to the former USTs. Based on the

November 1999 groundwater monitoring data, reported concentrations of BTEX do not appear to pose a significant risk, based on the Regional Board RBSLs.

In addition, the shallow impacted groundwater is not currently used as a source of drinking water, and based on monitoring data and the distance to potentially impacted wells, is not projected to impact drinking water within the life of the plume. Therefore, consistent with Regional Board guidance, the groundwater ingestion pathway was not considered as the impacted groundwater is not currently used as a source of drinking water or projected to be used within the life of the plume.

5.6 NO SIGNIFICANT RISK TO ENVIRONMENT

The release at the Site does not have a potential to significantly impact surface water, wetlands, other sensitive receptors. Therefore, there is no anticipated significant risk to the environment.

6.0 RECOMMENDATION FOR NO FURTHER ACTION

Based on the soil data and the groundwater monitoring results, the removal of the three USTs and associated product piping in August 1998 appears to have effectively removed the source of petroleum hydrocarbons from the Site. The Site characteristics are consistent with those identified by the Regional Board for low risk groundwater site.

It is reasonably anticipated that natural attenuation processes will continue to operate and should be effective in reducing concentrations of petroleum hydrocarbons remaining in soil and groundwater at the Site. Based on the Site conditions, current land use, and likelihood for natural attenuation processes to continue to operate, no further action is recommended for the UST release at the Site.

7.0 REFERENCES

California Regional Water Quality Control Board – San Francisco Bay. *Application of Risk-Based Screening Levels and Corrective Action to Sites with Contaminated Soil and Groundwater, Volume 1: Summary Tier 1 Lookup Tables (DRAFT).* April 2000.

California Regional Water Quality Control Board – San Francisco Bay. *Regional Board Supplemental Instructions to State Water Board December 8, 1995, Interim Guidance on Required Cleanup oat Low-Risk Fuel Sites.* January 5, 1996.

California Regional Water Quality Control Board – Central Valley. *A Compilation of Water Quality Goals.* March 1995.

California Regional Water Quality Control Board - San Francisco Bay Region. *Memorandum - Regional Board Supplemental Instructions to State Water Board December 8, 1995, Interim Guidance on Required Cleanup at Low-Risk Fuel Sites*, January 5, 1996.

California Regional Water Quality Control Board - San Francisco Bay Region. *San Francisco Basin – Water Quality Control Plan*, June 21, 1995.

Kleinfelder. *Preliminary Findings Former Hummingbird Haven Glider Airport, 8683 Paterson Pass Road*, Kleinfelder, Inc., April 14, 1997.

Lawrence Livermore National Laboratory. *Recommendations to Improve the Cleanup Processes for California's Leaking Underground Fuel Tanks.* October 16, 1995.

Lawrence Livermore National Laboratory. *Groundwater Investigation and Remediation, LLNL Environmental Report for 1998.* 1998.

Marshack, J. B. *A Compilation of Water Quality Goals.* California Environmental Protection Agency Regional Water Quality Control Board Central Valley Region. August, 2000.

Pacific States. *Closure Report for the Underground Storage Tank Removal Activities at the Monarch Airport, 8683 Patterson Pass Road, Livermore, California, Pacific* States Environmental Contractors, Inc., November 2, 1998.

Snedocor, G.W., Cochran, W.G., *Statistical Methods*, eighth edition, Iowa State University Press.

State Water Resources Control Board. *Leaking Underground Fuel Tank Field Manual: Guidelines for Site Assessment, Cleanup, and Underground Storage Tank Regulations.* October 1989, Revision.

State Water Resources Control Board. *California Underground Storage Tank Regulations, CCR Title 23, Division 3, Chapter 16, Article 11.* May 1994.

State Water Resources Control Board. *Resolution No. 1021b, (Draft) Policy for Investigation and Cleanup of Petroleum Discharges to Soil and Groundwater.* November 1996b.

United States Geological Survey. *Preliminary Geological Map Emphasizing Bedrock Formations in Alameda County California: Derived from the Digital Database Open File Report 96-252.* R.W. Graymer, D.L. Jones, E.E. Brabb, 1996.

United States Geological Survey. Quaternary Geology of Alameda County, and Surrounding Areas: Derived form the Digital Database Open-File Report 97-97, Helley, E.J., and Graymer, R.W, 1997.

TABLE 1
GROUNDWATER ELEVATIONS
Former Monarch Airport
Livermore, California

Location	MWT-1		MWT-2		MWT-3	
Well Casing Depth (ft)	64		49		43	
Top of Casing Elevation (ft-msl)	646.83		646.68		647.60	
Date	Depth to water (ft)	Elevation (ft-msl	Depth to water (ft)	Elevation (ft-msl	Depth to water (ft)	Elevation (ft-msl)
3/26/97	31.71	615.12	31.22	615.46	29.78	617.82
2/3/99	29.84	616.99	29.30	617.38	28.10	619.50
8/27/99	30.43	616.40	29.75	616.93	28.61	618.99
11/19/99	31.20	615.63	30.55	616.13	29.37	618.23

Notes:
ft-msl : feet above mean sea level

TABLE 2
SOIL LABORATORY RESULTS
Former Monarch Airport
Livermore, California

Sample ID	Sample Date	Depth (ft)	TPHmo (mg/kg)	TPHk (mg/kg)	TPHd (mg/kg)	TPHg (mg/kg)	MTBE (mg/kg)	Benzene (mg/kg)	Toluene (mg/kg)	Ethyl-benzene (mg/kg)	Xylene (mg/kg)	Lead (mg/kg)	pH (SU)	Moisture (%)
Site Investigation Samples														
KB1	3/31/97	35	<50	<1.0	<1.0	140	<0.62	<0.12	1.8	1.6	6.7	<5.0	--	--
	3/31/97	40	--	--	--	--	--	--	--	--	--	--	7.89	19.4
	3/31/97	45	<50	<1.0	<1.0	<1.0	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<5.0	--	--
KB2	3/31/97	35	<50	<1.0	<1.0	<1.0	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<5.0	--	--
	3/31/97	40	<50	<1.0	4.4 [2]	<1.0	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<5.0	--	--
KB3	3/31/97	20	<50	<1.0	<1.0	<1.0	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<5.0	--	--
	3/31/97	40	<50	<1.0	<1.0	<1.0	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<5.0	--	--
KB4	4/1/97	20	<50	<1.0	<1.0	<1.0	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<5.0	--	--
KB5	4/1/97	5	<50	<1.0	1.1 [1]	<1.0	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<5.0	--	--
	4/1/97	15	--	--	--	--	--	--	--	--	--	--	7.1	15.0
	4/1/97	25	<50	<1.0	1.1 [1]	<1.0	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<5.0	--	--
UST Removal Confirmation Samples														
1A	8/31/98	--	--	--	--	<1.0 [3]	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	--	--	--
2A	8/31/98	--	--	--	--	<1.0 [3]	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	--	--	--
3A	8/31/98	--	--	--	--	<1.0 [3]	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	--	--	--
4A	8/31/98	--	--	--	--	<1.0 [3]	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	--	--	--
IC	9/2/98	--	--	--	--	<1.0 [3]	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	77	--	--
UST Removal Soil Stockpile Samples														
1B, 2B, 3B, 4B	8/31/98	--	--	--	--	<1.0 [3]	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	--	--	--

Notes:

[1] Compound is in the Diesel range. It does not have a pattern characteristic of petroleum hydrocarbons (Chromalab).

[2] Hydrocarbon reported as Diesel, is in the late Diesel range and does not match our Diesel standard (Chromalab).

[3] TPHg was analyzed as aviation gasoline.

TPHmo Total Petroleum Hydrocarbons as motor oil
TPHk Total Petroleum Hydrocarbons as kerosen
TPHd Total Petroleum Hydrocarbons as diesel
TPHg Total Petroleum Hydrocarbons as gasoline

mg/kg milligrams per kilogram (parts per million)
SU standard units
-- Not analzyzed

TABLE 3
GROUNDWATER LABORATORY RESULTS- ORGANICS
Former Monarch Airport
Livermore, California

Sample ID	Sample Date	TPHmo (µg/l)	TPHk (µg/l)	TPHd (µg/l)	TPHg (µg/l)	MTBE (µg/l)	Benzene (µg/l)	Toluene (µg/l)	Ethyl-benzene (µg/l)	Xylenes (µg/l)	1,2-DCA (µg/l)	Lead [4] (mg/l)
Grab Groundwater Samples from Soil Borings												
KB1-W1	3/31/97	<500	<50	64 [1]	220	<50	2.1	0.93	16	51	--	0.087
KB2-W1	3/31/97	<500	<50	180 [1]	66	<50	<0.50	<0.50	1.4	5.4	--	0.25
KB4-W1	4/1/97	<500	<50	80 [1]	<50	<50	<0.50	<0.50	<0.50	<0.50	--	0.17
Groundwater Samples from Monitoring Wells												
MWT-1	3/26/97	<500	<50	<50	<50	<5.0	<0.50	<0.50	<0.50	<0.50	--	0.017
	2/3/99	--	--	110 [1]	<50	--	<0.50	<0.50	<0.50	<0.50	<0.50	<0.0050
	8/27/99	--	--	<50	<50	--	<0.50	<0.50	<0.50	<0.50	--	--
	11/19/99	--	--	<50	<50	--	<0.50	<0.50	<0.50	<0.50	--	
MWT-2	3/26/97	<500	<50	<50	5,400	<5.0	20	22	370	890	--	0.010
	2/3/99	--	--	960 [2]	13,000	--	220	110	2,200	2,800	<0.50	<0.0050
	8/27/99	--	--	280	5,000	--	110	<0.50	450	400	--	--
	11/19/99	--	--	230 [2]	8,100	<5.0	180	<0.50	780	1,000	--	
MWT-3	3/26/97	<500	<50	<50	<50	<5.0	<0.50	<0.50	2	1	--	0.018
	2/3/99	--	--	94 [1]	<50	--	<0.50	<0.50	<0.50	<0.50	<0.50	<0.0050
	8/27/99	--	--	<50	<50	--	<0.50	<0.50	<0.50	<0.50	--	--
	11/19/99	--	--	<50	86 [3]	<5.0	<0.50	<0.50	<0.50	<0.50	--	
Monitoring Well												
MW-1	3/26/97	--	--	--	--	--	<0.50	<0.50	<0.50	<0.50	<0.50	--
Supply Well												
Domestic Well	3/31/97	--	--	--	--	--	<0.50	<0.50	<0.50	<0.50	--	--

Notes:

1 Hydrorcarbon reported does not match the pattern Diesel standard (Chromalab).

2 Hydrorcarbon reported is in the early Diesel Range and does not match Diesel standard (Chromalab).

3 Hydrocarbon reported in the gasoline range does not match gasoline standard (Chromalab).

4 Samples collected in 1999 were filtered by the laboratory prior to analysys.

TPHmo Total Petroleum Hydrocarbons as motor oil

TPHk Total Petroleum Hydrocarbons as kerosen

TPHd Total Petroleum Hydrocarbons as diesel

TPHg Total Petroleum Hydrocarbons as gasoline

1,2-DCA 1,2-Dichloroethane

-- Not analzyzed

TABLE 4
WATER SUPPLY WELL SURVEY
Former Monarch Airport
Livermore, California

Zone 7 Well ID	Address	Owner	Distance and Direction from Site	Well Type	Date Installed	Well Diameter (inches)	Total Depth (feet)	Screen Interval (feet)
3S/2E_1J1	1227 Greenville Rd	Dublin Rock&Ready-Mix	2,800 feet northwest	Industrial Supply	4/8/74	8	124	76-116
3S/2E_1J3	1119 Greenville Rd.	Gene Caldera	2,800 feet northwest	Domestic Supply	6/1/79	5	160	40-160
3S/3E_7D1	--	J. Bettencourt	2,000 feet south southwest	Irrigation	1947	12	400	180-396
3S/2E_6N1	Greenville Industrial Center	Greenville Industrial Center	600 feet west	Domestic Supply	--	8	136 (300)	--

Notes:
Zone 7 Alameda Flood Control & Water Conservation District Zone 7
-- unknown

TABLE 5
COMPARISON OF SOIL AND GROUNDWATER CONCENTRATIONS WITH RISK BASED SCREENING LEVELS
Former Monarch Airport
Livermore, California

Exposure Pathway	Receptor Scenario			Benzene		Toluene		Ethyl Benzene		Xylenes	
				RME	RBSL	RME	RBSL	RME	RBSL	RME	RBSL
SOIL											
Soil volatilization to outdoor air	R	Incomplete	Residual concentrations from the removal of the UST were less than the detection limits. The only detection was in soil collected from the saturated zone at 35 feet bgs. (see Groundwater)	<0.12	--	1.8	--	1.6	--	6.7	--
	C & I	Incomplete			--		--		--		--
Soil-vapor intrusion from soil to buildings	R	Incomplete			--		--		--		--
	C & I	Incomplete			--		--		--		--
Surficial soil ingestion, dermal, inhalation	R	Incomplete			--		--		--		--
	C & I	Incomplete			--		--		--		--
Soil leachate to protect subsequent ingestion of groundwater	R	Incomplete			--		--		--		--
	C & I	Incomplete			--		--		--		--
GROUNDWATER											
Groundwater volatilization to outdoor air	R	Partial	No persons living at Site, but people at the house on the property could visit Site	90.8	5,800	<0.50	530,000 (sol)	394	170,000 (sol)	509	161,000 (sol)
	C & I	Partial			5,800		530,000 (sol)		170,000 (sol)		161,000 (sol)
Ground water-vapor intrusion from groundwater to buildings	R	Partial	No persons living or working at Site, but land use could change and property could be developed		5,800		530,000 (sol)		170,000 (sol)		161,000 (sol)
	C & I	Partial			5,800		530,000 (sol)		170,000 (sol)		161,000 (sol)
Groundwater ingestion*	R, C & I	Incomplete	Nearest drinking water well 600 feet from release.		--		--		--		--

Notes:
All soil concentrations in milligrams per kilogram (mg/kg). All groundwater concentrations in micrograms per liter (µg/l).
California Regional Water Qualtiy Control Board - San Francisco Region, Interim Final RBSLs, August 2000.
RBSL - Risk Based Screening Level -- = not applicable R = Residential C & I = Commercial & industrial sol = solubility threshold
* Lowest RBSL for human toxicity and ceiling values (taste and odor, etc.)
RME = Reasonable Maximum Exposure concentration calculated as either 95 percent upper confidence level using most recent data from monitoring wells and hydropunch locations, or, maximum concentration measured at the Site.

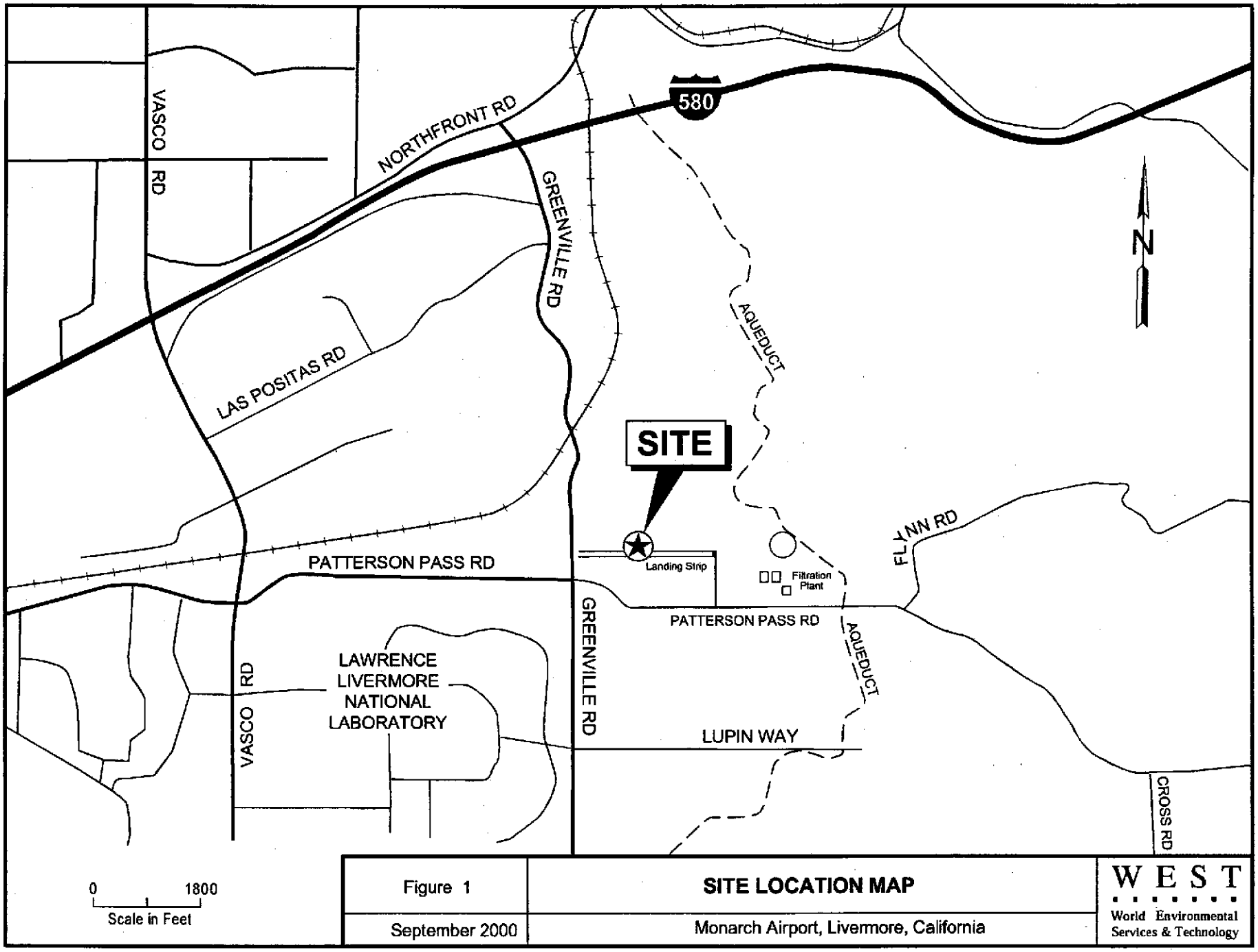
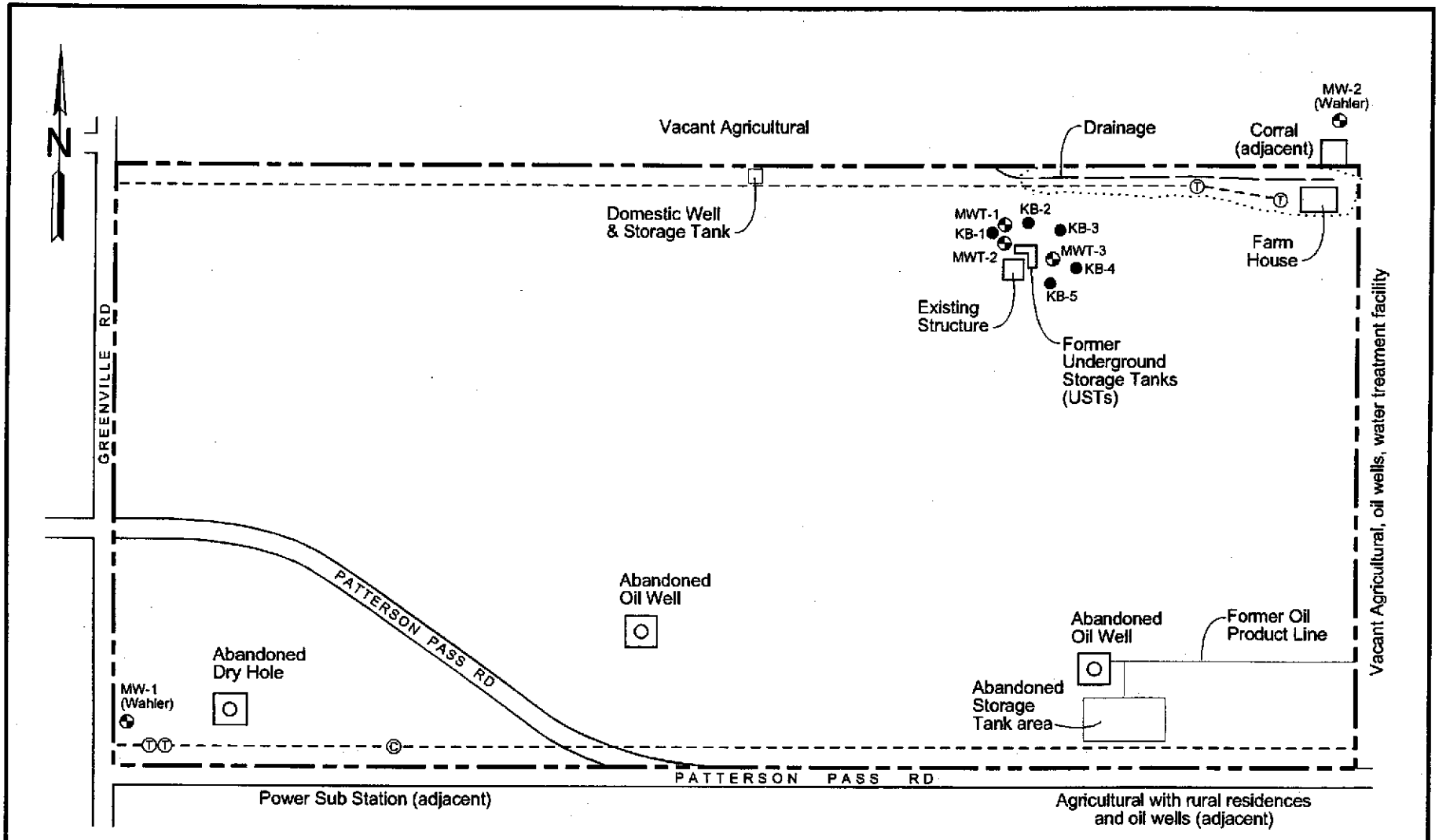


Figure 1	SITE LOCATION MAP	WEST
September 2000	Monarch Airport, Livermore, California	World Environmental Services & Technology



EXPLANATION

Approximate locations:

- MWT-3 ⊕ Monitoring Well
- MW-1 ⊕ Monitoring Well (Wahler)
- KB-5 ● Soil Boring
- KB-4 ● Hydropunch Boring (KB-1 & KB-4)

- Property Line/Fence
- Power Line
- Ⓣ Pole Mounted Transformer
- Ⓒ Pole Mounter Capacitor

0 400 Feet

Approximate Scale

Figure 2	SITE PLAN AND SAMPLING LOCATIONS	WEST World Environmental Services & Technology
October 2000	Monarch Airport, Livermore, California	

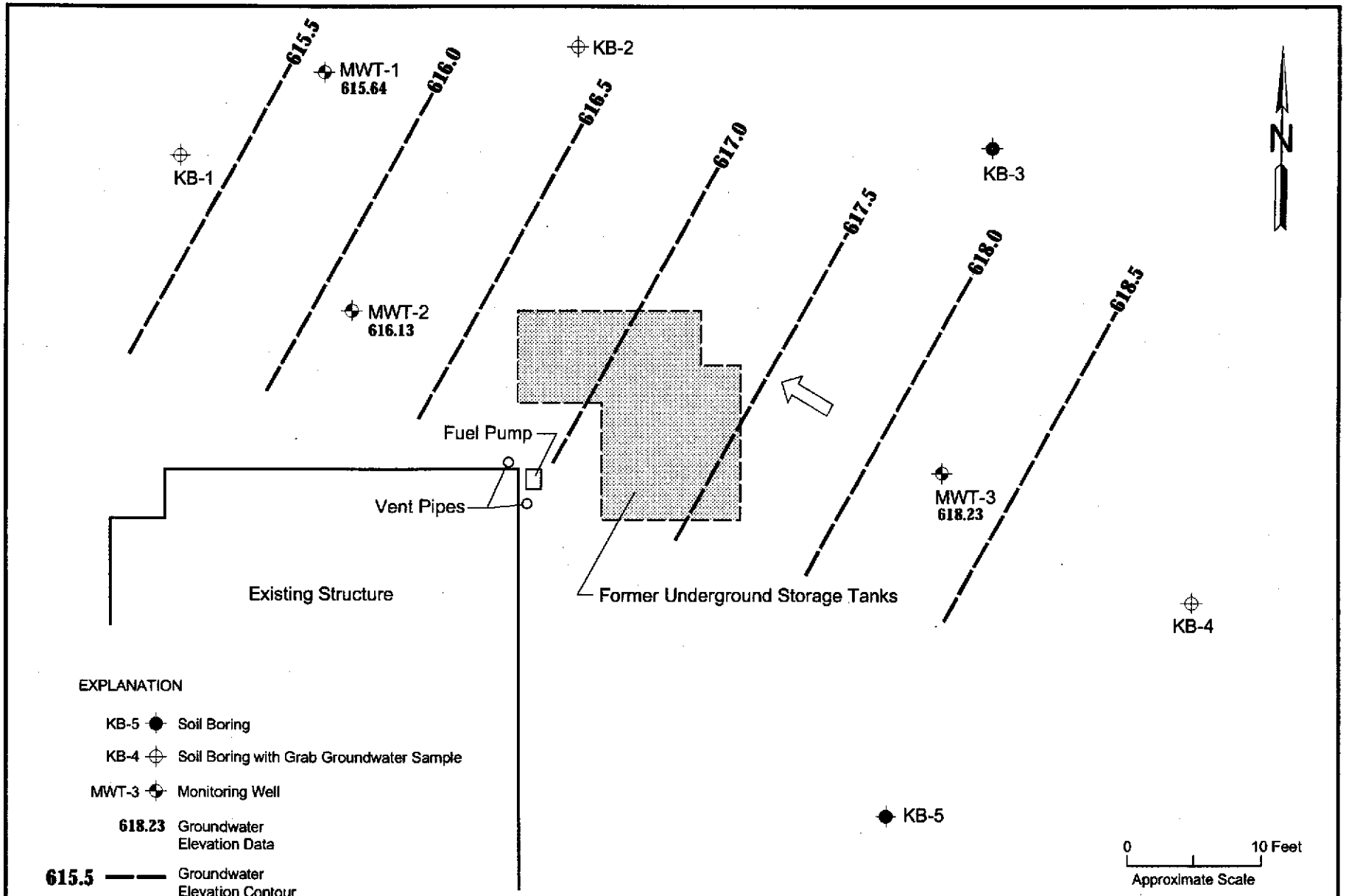


Figure 3	Groundwater Contour Map – November 1999	WEST World Environmental Services & Technology
September 2000	Monarch Airport, Livermore, California	

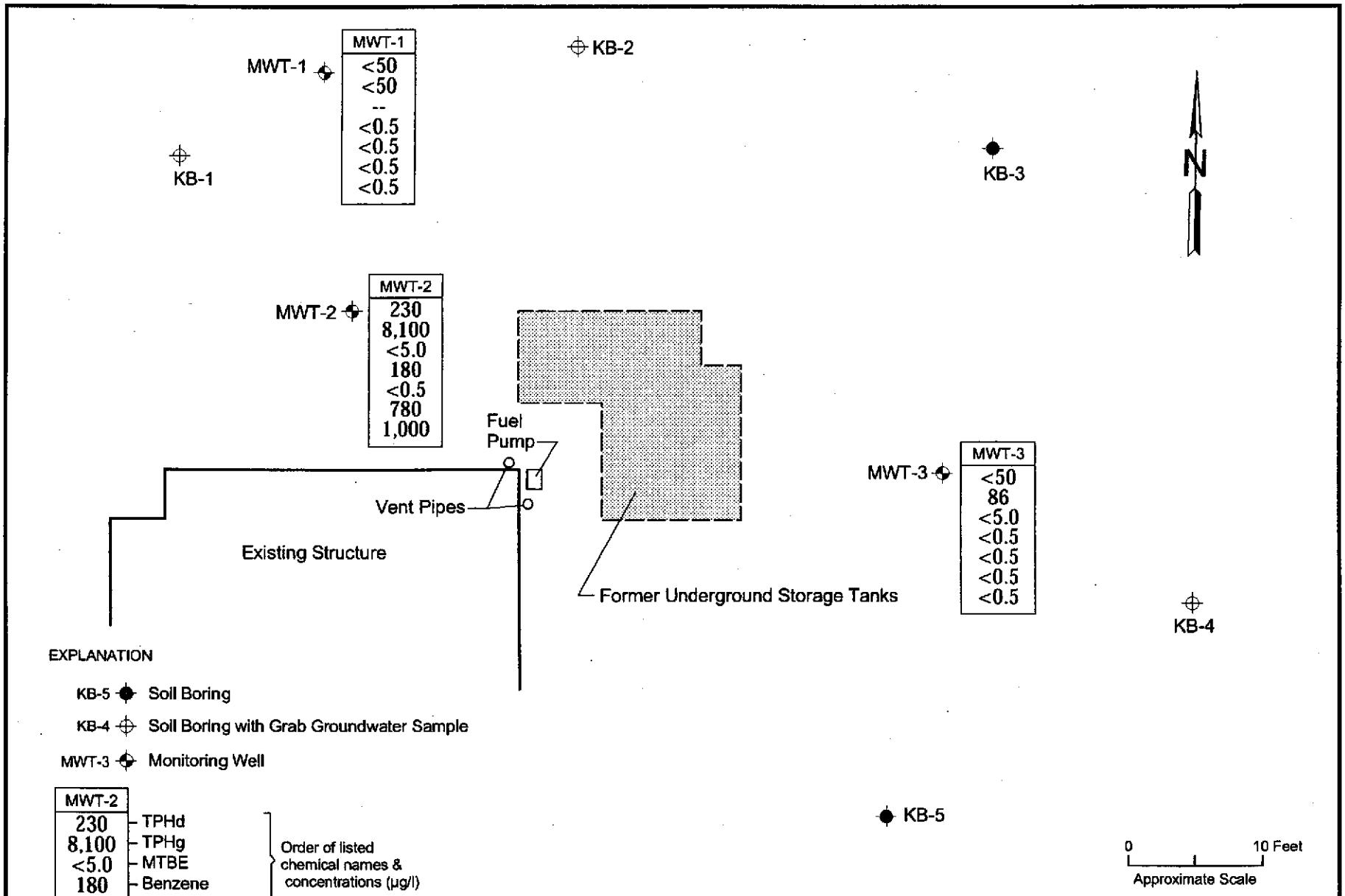
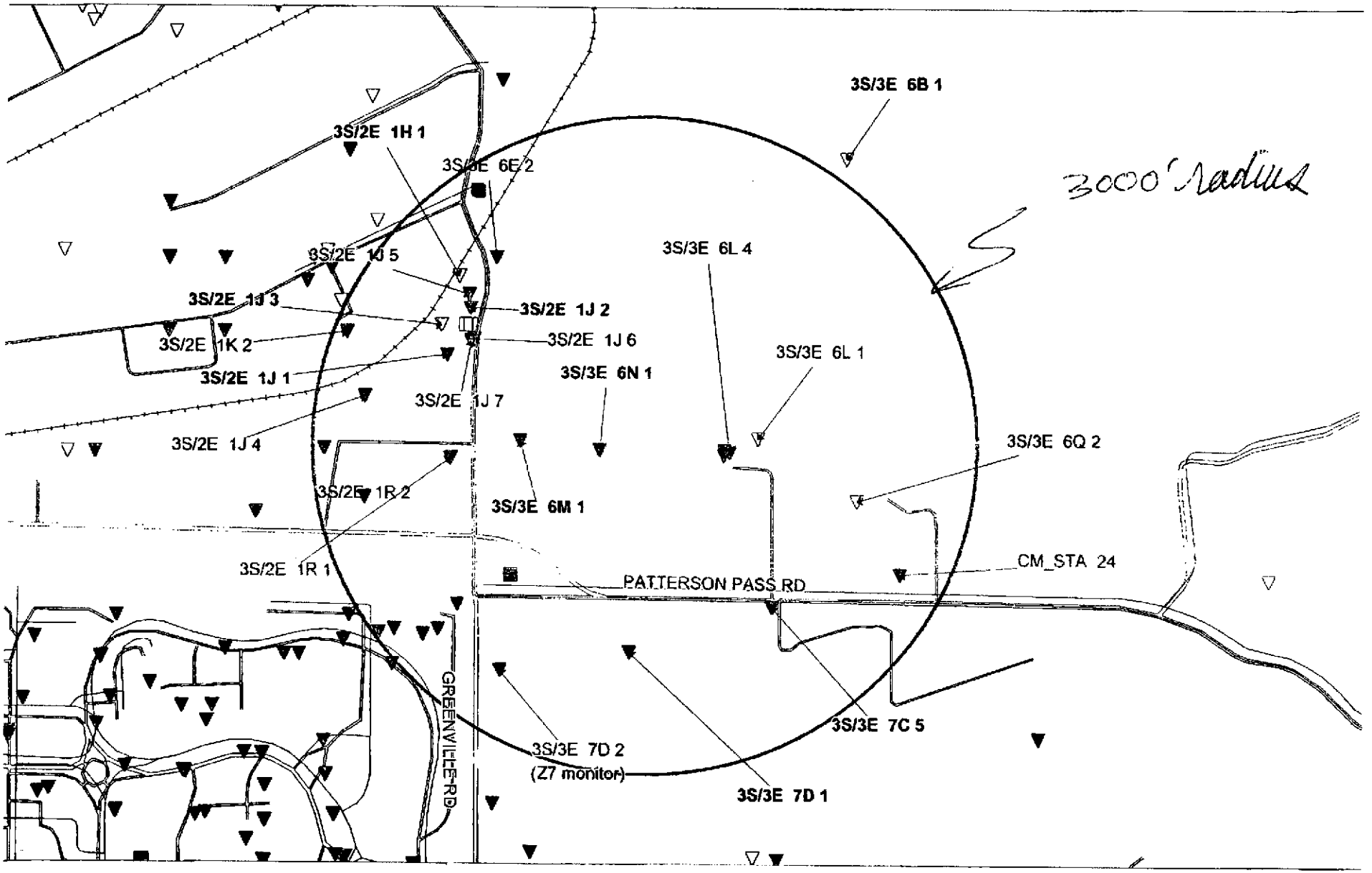


Figure 4	Groundwater Analytical Results – November 1999	WEST World Environmental Services & Technology
September 2000	Monarch Airport, Livermore, California	

APPENDIX A

WELL SURVEY


3S/3E 6B 1
3S/2E 1H 1
3S/3E 6E 2
3000' radius
3S/2E 1J 5
3S/3E 6L 4
3S/2E 1J 3
3S/2E 1J 2
3S/2E 1K 2
3S/2E 1J 6
3S/3E 6L 1
3S/2E 1J 1
3S/3E 6N 1
3S/2E 1J 7
3S/2E 1J 4
3S/3E 6Q 2
3S/2E 1R 2
3S/3E 6M 1
3S/2E 1R 1
CM_STA 24
PATTERSON PASS RD
GREENVILLE RD
3S/3E 7C 5
3S/3E 7D 2
(Z7 monitor)
3S/3E 7D 1

PATTERSON PASS 3000 FT RADIUS

ELL #	ADDRESS	CITY	OWNER	CCE	CCN	COMPLETED	DEPTH	DIAM	LOG	PERF_U	PERF_L	DESTROYED	STATUS	USE
/2E 1J 1	1227 Greenville Rd	LIVERMORE	DUBLIN ROCK & READY-MIX	1653700.1	439150.1	4/8/74	124.0	8.0	2	76.0	116.0	00000000	INDUSTRIAL WELL	sup
/2E 1J 2	Livermore		Livermore Truck and Tra	1653906.5	439565.8	00000000	0.0	0.0	0	0.0	0.0	00000000	DESTROYED	
/2E 1J 4	MARATHON AT GREENVILLE		MARATHON PROPERTIES	1652962.4	438779.4	3/28/88	59.5	2.0	0	0.0	0.0	00000000		mon
/2E 1J 5	1119 GREENVILLE RD.	LIVERMORE	EUGENE CALDEIRA	1653894.3	439689.9	7/5/90	49.0	2.0	1	34.0	49.0	2/28/97	DESTROYED	mon
/2E 1J 6	1119 GREENVILLE RD	LIVERMORE	EUGENE CALDEIRA	1653945.5	439287.8	9/16/93	50.0	2.0	1	30.0	50.0	2/28/97	DESTROYED	mon
/2E 1J 7	1119 GREENVILLE RD	LIVERMORE	EUGENE CALDEIRA	1653858.4	439272.3	9/16/93	50.0	2.0	1	30.0	50.0	2/28/97	DESTROYED	mon
/2E 1K 2	LAVENDER AVE, N. OF WEST.PACIFIC RR,LIV		PG&E	1652800.0	439350.0	8/17/90	40.0	2.0	0	0.0	0.0	00000000		mon
/2E 1Q 2	MARATHON DR NR. PATTERSON PASS RD		LINCOLN PROPERTY CO.	1652597.3	438309.5	11/30/88	49.5	2.0	0	0.0	0.0	00000000	DESTROYED	
/2E 1R 1	GREENVILLE AT MARATHON		MARATHON PROPERTIES	1653730.3	438229.1	3/28/88	59.0	2.0	0	0.0	0.0	00000000		mon
/2E 1R 2	PATTERSON AT MARATHON		MARATHON PROPERTIES	1652957.5	437878.9	3/28/88	59.5	2.0	0	0.0	0.0	00000000		mon
/2E 12A 1			LLNL	1653223.0	436700.0	00000000	0.0	0.0	0	0.0	0.0	00000000	DESTROYED	
/2E 12A 2			LLNL	1653794.5	436926.6	5/14/81	105.0	5.0	0	72.0	102.0	00000000		
/2E 12A 3			LLNL	1653082.2	436668.1	00000000	0.0	0.0	0	0.0	0.0	00000000	DESTROYED	
/2E 12A 4			LLNL	1653082.2	436668.1	00000000	0.0	0.0	0	0.0	0.0	00000000	DESTROYED	
/2E 12A 5			LLNL	1653082.2	436668.1	00000000	0.0	0.0	0	0.0	0.0	00000000	DESTROYED	
/2E 12A 6			LLNL	1653082.2	436668.1	00000000	0.0	0.0	0	0.0	0.0	00000000	DESTROYED	
/2E 12A 7			LLNL	1653082.2	436668.1	00000000	0.0	0.0	0	0.0	0.0	00000000	DESTROYED	
/2E 12A 8			LLNL	1653484.3	436653.7	00000000	0.0	0.0	0	0.0	0.0	00000000	DESTROYED	
/2E 12A 9			LLNL	1653484.3	436653.7	00000000	0.0	0.0	0	0.0	0.0	00000000	DESTROYED	
/2E 12A10			LLNL	1653484.3	436653.7	00000000	0.0	0.0	0	0.0	0.0	00000000	DESTROYED	
/2E 12A11			LLNL	1653616.9	436699.8	00000000	0.0	0.0	0	0.0	0.0	00000000	DESTROYED	
/2E 12A14	GREENVILLE RD. AND PATTERSON PASS		LLNL	1653208.0	436384.0	8/16/88	51.5	4.5	1	41.5	51.5	00000000		
/3E 6E 2	GREENVILLE RD & NATIONAL DR	LIVERMORE	JILCHRIS DEVELOPMENT	1654141.4	440017.6	1/30/89	50.0	2.0	1	35.0	50.0	00000000	STOVEPIPE MONITOR	mon
/3E 6L 2	.3MI N.OF PATTERSON PASS,.4MI E GREENVI		HUMMINGBIRD GLIDER PARK	1656208.1	438298.8	8/23/89	50.0	2.0	0	0.0	0.0	00000000		
/3E 6L 3	.3MI N.OF PATTERSON PASS,.4MI E GREENVI		HUMMINGBIRD GLIDER PARK	1656203.8	438256.1	8/23/89	65.0	2.0	0	0.0	0.0	00000000		
/3E 6L 4	.3MI N.OF PATTERSON PASS,.4MI E GREENVI		HUMMINGBIRD GLIDER PARK	1656259.8	438282.9	8/23/89	50.0	2.0	0	0.0	0.0	00000000		
/3E 6M 1	Greenville Industrial Center, Greenvil		Greenville Industrial C	1654362.8	438384.1	00000000	0.0	0.0	0	0.0	0.0	00000000	DESTROYED	
/3E 6N 1	Greenville Industrial Center, Greenvil		Greenville Industrial C	1655079.8	438303.0	00000000	136.0	0.0	0	0.0	0.0	00000000	DESTROYED	
/3E 7C 5	20 S OF PATTERSON PASS ROAD	LIVERMORE	BETTENCOURT	1656641.5	436902.5	00000000	74.0	7.0	0	0.0	0.0	00000000	ABANDONED	sup
/3E 7D 1			J. BETTENCOURT	1655346.5	436498.7	00000000	400.0	12.0	0	0.0	0.0	00000000		
/3E 7D 2	GREENVILLE NR PATTERSON		Z7 MON	1654175.4	436332.2	00000000	74.0	2.5	1	64.0	69.0	00000000	MON	mon
M_STA 24	8750 PATTERSON PASS RD, LIVERMORE, CA 550			1657800.0	437200.0	1/1/63	0.0	0.0	0	0.0	0.0	00000000		
/2E 1J 8	1119 GREENVILLE ROAD	LIVERMORE	EUGENE CALDEIRA	1653867.7	439419.0	00000000	47.2	2.0	0	0.0	0.0	2/28/97	DESTROYED	mon
/2E 1J 9	1119 GREENVILLE ROAD	LIVERMORE	EUGENE CALDEIRA	1653905.3	439419.0	00000000	48.0	2.0	0	0.0	0.0	2/28/97	DESTROYED	mon
/2E 1H 1	1113 GREENVILLE RD	LIVERMORE	SIERRA PRODUCTS	1653803.8	439850.5	00000000	0.0	0.0	0	0.0	0.0	00000000	ABANDONED AND COVERED	
/2E 1J 3	1119 GREENVILLE RD	LIVERMORE	GENE CALDIERA	1653647.8	439413.1	6/1/78	160.0	5.0	2	40.0	160.0	00000000	DOMESTIC SUPPLY	pot
/3E 6L 1	PATTERSON PASS RD & GREENVILLE RD	LIVERMORE	JILCHRIS DEVELOPMENT	1656517.4	438402.2	1/31/89	40.0	2.0	1	30.0	40.0	00000000	MONITORING	mon
TP86002A	800 GREENVILLE ROAD, LIVERMORE		ALLIED METAL FABRICATOR	0.0	0.0	3/26/86	0.0	0.0	0	0.0	0.0	00000000		
DX020	GREENVILLE RD & PATTERSON PASS RD	LIVERMORE	MARATHON	1654272.4	437188.9	00000000	0.0	0.0	0	0.0	0.0	00000000		
/3E 6Q 2	PATTERSON PASS RD EAST OF GREENVILL	LIVERMORE	CITY OF LIVERMORE	1657412.3	437850.6	12/13/95	170.0	2.0	1	120.0	170.0	00000000	ANODE WELL	CATHODIC

ALAMEDA COUNTY FLOOD CONTROL
AND WATER CONSERVATION DISTRICT

WELL DATA

No. 3S/3E-6N1

Owner T. NELSON 447-4110 OR 4793
Address 8638 PATTERSON PASS RD
Tenant (SAME) NO. CA SOARING ASSO.
Address HUMMINGBIRD HAVEN

State No. 3S/3E-6N1
Other No.

Type of Well:
Location: County Basin No.
U.S.G.S. Quad. Quad. No.
¼ ¼ Section Twp. Rge MD Base & Meridian

Description OUTSIDE TANK HOUSE ON SOUTH SIDE. TWO TANKS INSIDE ONE IS A 8'± Ø REDWOOD STORAGE TANK THE OTHER IS A 4'Ø STEEL PRESSURE TANK FED FROM WOOD TANK BY BOOSTER PUMP.

Reference Point description TOP OF 1" PIPE COUPLING ON TOP OF WELL COVER PLATE. REMOVE 1" PIPE PLUG.

which is 0.7 ft (ABOVE / BELOW) land surface. Ground Elevation
Reference Point Elev. 635 ft. Determined from QUAD (WH)
Well: Use DOMESTIC Condition MEASURABLE & SAMPLABLE Depth 136
Casing, size 8 in. perforations 50 TO 70 PER OWNER

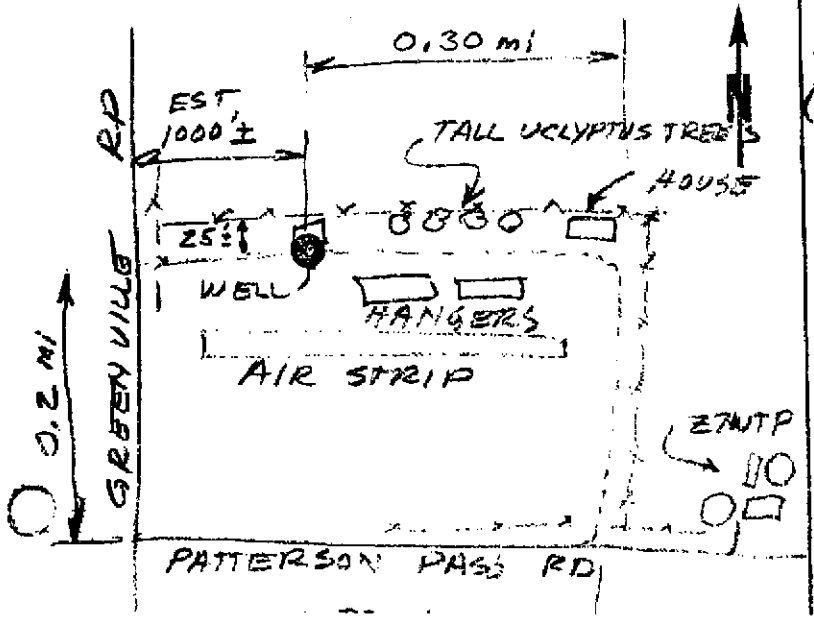
Water Levels available: Yes (1) No
Period of Record: Begin End
Measurements By:

Water Analysis available: Yes (1) No
Period of Record: Begin End
Collecting Agency:

Driller DICK PECK ?
Date drilled 25 YEARS ± Log, filed open (1) confidential (2)
Equipment: Pump, type SUB make FRANKLIN CONTROLER
Serial No. Size of discharge pipe 1 in.
Power kind Make
H.P. 1/4 Motor Serial No.

Elec. Meter No Transformer No.
Yield G.P.M. Pumping level

SKETCH



REMARKS

17-10-18 WH NOTE ON WALL SAYS WELL IS 136' DEEP ON 5/ (SOUNDED AT 131 TODAY) OWNER SAID WELL WENT TO 300' CASED BUT WAS SEALE OFF BECAUSE OF GAS. DTW = 56.0

Recorded by: W. HARVEST

APPENDIX B

LABORATORY CERTIFICATES AND CHAINS-OF-CUSTODY

1999 GROUNDWATER MONITORING

West World Environmental
828 Mission Street, 2nd Floor
San Rafael, CA 94901

Attn.: Steve Michelson

Project ~~Pac Plates~~ Monar
DEC 07 1999
File 3-lab

Project: Monarch Airport Livermore

Attached is our report for your samples received on Friday November 19, 1999
This report has been reviewed and approved for release. Reproduction of this report is permitted only in its entirety.

Please note that any unused portion of the samples will be discarded after December 19, 1999 unless you have requested otherwise. We appreciate the opportunity to be of service to you. If you have any questions, please call me at (925) 484-1919

Sincerely,

Gary Cook

CHROMALAB, INC.
Environmental Services (SDB)

Submission #: 1999-11-0390

Diesel

West World Environmental	828 Mission Street, 2nd Floor San Rafael, CA 94901
Attn: Steve Michelson	Phone: (415) 460-6770 Fax: (415) 485-6062
Project #:	Project: Monarch Airport Livermore

Samples Reported

Sample ID	Matrix	Date Sampled	Lab #
MWT-3	Water	11/19/1999 11:20	1
MWT-2	Water	11/19/1999 12:35	2
MWT-1	Water	11/19/1999 14:00	3

1220 Quarry Lane * Pleasanton, CA 94566-4756
Telephone: (925) 484-1919 * Facsimile: (925) 484-1096

CHROMALAB, INC.

Environmental Services (SDB)

Submission #: 1999-11-0390

To: **West World Environmental**
Attn.: Steve Michelson

Test Method: 8015m
Prep Method: 3510/8015M

Diesel

Sample ID: **MWT-3**
Project: Monarch Airport Livermore
Sampled: 11/19/1999 11:20
Matrix: Water

Lab Sample ID: **1999-11-0390-001**
Received: 11/19/1999 10:45
Extracted: 11/24/1999 09:00
QC-Batch: 1999/11/24-01.10

Compound	Result	Rep.Limit	Units	Dilution	Analyzed	Flag
Diesel	ND	50	ug/L	1.00	11/30/1999 20:54	
Surrogate(s)						
o-Terphenyl	99.2	60-130	%	1.00	11/30/1999 20:54	

CHROMALAB, INC.

Environmental Services (SDB)

Submission #: 1999-11-0390

To: **West World Environmental**
Attn.: Steve Michelson

Test Method: 8015m
Prep Method: 3510/8015M

Diesel

Sample ID: **MWT-2**
Project: Monarch Airport Livermore
Sampled: 11/19/1999 12:35
Matrix: Water

Lab Sample ID: **1999-11-0390-002**
Received: 11/19/1999 10:45
Extracted: 11/24/1999 09:00
QC-Batch: 1999/11/24-01.10

Compound	Result	Rep.Limit	Units	Dilution	Analyzed	Flag
Diesel	230	51	ug/L	1.02	11/30/1999 21:40	ed
Surrogate(s)						
o-Terphenyl	96.0	60-130	%	1.00	11/30/1999 21:40	

CHROMALAB, INC.

Environmental Services (SDB)

Submission #: 1999-11-0390

To: **West World Environmental**
Attn.: Steve Michelson

Test Method: 8015m
Prep Method: 3510/8015M

Diesel

Sample ID: **MWT-1**
Project: Monarch Airport Livermore
Sampled: 11/19/1999 14:00
Matrix: Water

Lab Sample ID: **1999-11-0390-003**
Received: 11/19/1999 10:45
Extracted: 11/24/1999 09:00
QC-Batch: 1999/11/24-01.10

Compound	Result	Rep.Limit	Units	Dilution	Analyzed	Flag
Diesel	ND	50	ug/L	1.00	11/30/1999 22:26	
Surrogate(s)						
o-Terphenyl	98.5	60-130	%	1.00	11/30/1999 22:26	

CHROMALAB, INC.

Environmental Services (SDB)

Submission #: 1999-11-0390

To: **West World Environmental**
Attn.: Steve Michelson

Test Method: 8015m
Prep Method: 3510/8015M

Batch QC Report

Diesel

Method Blank **Water** **QC Batch # 1999/11/24-01.10**

MB: 1999/11/24-01.10-001 Date Extracted: 11/24/1999 09:00

Compound	Result	Rep.Limit	Units	Analyzed	Flag
Diesel	ND	50	ug/L	11/24/1999 18:24	
Surrogate(s)					
o-Terphenyl	98.5	60-130	%	11/24/1999 18:24	

CHROMALAB, INC.

Environmental Services (SDB)

Submission #: 1999-11-0390

To: **West World Environmental**
Attn: Steve Michelson

Test Method: 8015m
Prep Method: 3510/8015M

Batch QC Report

Diesel

Laboratory Control Spike (LCS/LCSD) **Water** **QC Batch # 1999/11/24-01.10**

LCS: 1999/11/24-01.10-002 Extracted: 11/24/1999 09:00 Analyzed: 11/30/1999 20:10
LCSD: 1999/11/24-01.10-003 Extracted: 11/24/1999 09:00 Analyzed: 11/30/1999 20:54

Compound	Conc. [ug/L]		Exp Conc. [ug/L]		Recovery [%]		RPD	Ctrl. Limits [%]		Flags	
	LCS	LCSD	LCS	LCSD	LCS	LCSD	[%]	Recovery	RPD	LCS	LCSD
Diesel	1030	1120	1250	1250	82.4	89.6	8.4	60-130	25		
Surrogate(s)											
o-Terphenyl	22.3	23.0	20.0	20.0	111.5	115.0		60-130			

CHROMALAB, INC.

Environmental Services (SDB)

Submission #: 1999-11-0390

To: **West World Environmental**
Attn: Steve Michelson

Test Method: 8015m
Prep Method: 3510/8015M

Legend & Notes

Diesel

Analyte Flags

ed

Hydrocarbon reported is in the early Diesel range, and does not match our Diesel standard

1220 Quarry Lane * Pleasanton, CA 94566-4756
Telephone: (925) 484-1919 * Facsimile: (925) 484-1096

Printed on: 12/02/1999 13:09

CHROMALAB, INC.

Environmental Services (SDB)

Submission #: 1999-11-0390

Gas/BTEX and MTBE

West World Environmental	☒	828 Mission Street, 2nd Floor San Rafael, CA 94901
Attn: Steve Michelson		Phone: (415) 460-6770 Fax: (415) 485-6062
Project #:	Project:	Monarch Airport Livermore

Samples Reported

Sample ID	Matrix	Date Sampled	Lab #
MWT-3	Water	11/19/1999 11:20	1
MWT-2	Water	11/19/1999 12:35	2
MWT-1	Water	11/19/1999 14:00	3

CHROMALAB, INC.
Environmental Services (SDB)
Submission #: 1999-11-0390

To: **West World Environmental**
Attn.: Steve Michelson
Test Method: 8015M 8020
Prep Method: 5030

Gas/BTEX and MTBE

Sample ID:	**MWT-3**	Lab Sample ID:	**1999-11-0390-001**
Project:	Monarch Airport Livermore	Received:	11/19/1999 10:45
		Extracted:	11/30/1999 21:11
Sampled:	11/19/1999 11:20	QC-Batch:	1999/11/30-01.01
Matrix:	Water		

Compound	Result	Rep.Limit	Units	Dilution	Analyzed	Flag
Gasoline	86	50	ug/L	1.00	11/30/1999 21:11	g
Benzene	ND	0.50	ug/L	1.00	11/30/1999 21:11	
Toluene	ND	0.50	ug/L	1.00	11/30/1999 21:11	
Ethyl benzene	ND	0.50	ug/L	1.00	11/30/1999 21:11	
Xylene(s)	ND	0.50	ug/L	1.00	11/30/1999 21:11	
MTBE	ND	5.0	ug/L	1.00	11/30/1999 21:11	
Surrogate(s)						
Trifluorotoluene	95.5	58-124	%	1.00	11/30/1999 21:11	
4-Bromofluorobenzene-FID	78.4	50-150	%	1.00	11/30/1999 21:11	

1220 Quarry Lane * Pleasanton, CA 94566-4756
Telephone: (925) 484-1919 * Facsimile: (925) 484-1096
Printed on: 12/02/1999 13:09

CHROMALAB, INC.

Environmental Services (SDB)

Submission #: 1999-11-0390

To: **West World Environmental**

Attn.: Steve Michelson

Test Method: 8015M 8020

Prep Method: 5030

Gas/BTEX and MTBE

Sample ID: **MWT-2**
Project: Monarch Airport Livermore
Sampled: 11/19/1999 12:35
Matrix: Water

Lab Sample ID: **1999-11-0390-002**
Received: 11/19/1999 10:45
Extracted: 12/01/1999 20:46
QC-Batch: 1999/12/01-01.01

Compound	Result	Rep.Limit	Units	Dilution	Analyzed	Flag
Gasoline	8100	500	ug/L	10.00	12/01/1999 20:46	
Benzene	180	5.0	ug/L	10.00	12/01/1999 20:46	
Toluene	ND	5.0	ug/L	10.00	12/01/1999 20:46	
Ethyl benzene	780	5.0	ug/L	10.00	12/01/1999 20:46	
Xylene(s)	1000	5.0	ug/L	10.00	12/01/1999 20:46	
MTBE	ND	50	ug/L	10.00	12/01/1999 20:46	
Surrogate(s)						
Trifluorotoluene	105.5	58-124	%	1.00	12/01/1999 20:46	
4-Bromofluorobenzene-FID	93.1	50-150	%	1.00	12/01/1999 20:46	

CHROMALAB, INC.

Environmental Services (SDB)

Submission #: 1999-11-0390

To: **West World Environmental**

Attn.: Steve Michelson

Test Method: 8015M 8020

Prep Method: 5030

Gas/BTEX and MTBE

Sample ID: **MWT-1**
Project: Monarch Airport Livermore
Sampled: 11/19/1999 14:00
Matrix: Water

Lab Sample ID: **1999-11-0390-003**
Received: 11/19/1999 10:45
Extracted: 12/01/1999 21:13
QC-Batch: 1999/12/01-01.01

Compound	Result	Rep.Limit	Units	Dilution	Analyzed	Flag
Gasoline	ND	50	ug/L	1.00	12/01/1999 21:13	
Benzene	ND	0.50	ug/L	1.00	12/01/1999 21:13	
Toluene	ND	0.50	ug/L	1.00	12/01/1999 21:13	
Ethyl benzene	ND	0.50	ug/L	1.00	12/01/1999 21:13	
Xylene(s)	ND	0.50	ug/L	1.00	12/01/1999 21:13	
MTBE	ND	5.0	ug/L	1.00	12/01/1999 21:13	
Surrogate(s)						
Trifluorotoluene	105.4	58-124	%	1.00	12/01/1999 21:13	
4-Bromofluorobenzene-FID	81.0	50-150	%	1.00	12/01/1999 21:13	

CHROMALAB, INC.

Environmental Services (SDB)

Submission #: 1999-11-0390

To: **West World Environmental**

Attn.: Steve Michelson

Test Method: 8015M 8020

Prep Method: 5030

Batch QC Report

Gas/BTEX and MTBE

Method Blank | **Water** | **QC Batch # 1999/11/30-01.01**

MB: 1999/11/30-01.01-001 | Date Extracted: 11/30/1999 06:38

Compound	Result	Rep.Limit	Units	Analyzed	Flag
Gasoline	ND	50	ug/L	11/30/1999 06:38	
Benzene	ND	0.5	ug/L	11/30/1999 06:38	
Toluene	ND	0.5	ug/L	11/30/1999 06:38	
Ethyl benzene	ND	0.5	ug/L	11/30/1999 06:38	
Xylene(s)	ND	0.5	ug/L	11/30/1999 06:38	
MTBE	ND	5.0	ug/L	11/30/1999 06:38	
Surrogate(s)					
Trifluorotoluene	112.4	58-124	%	11/30/1999 06:38	
4-Bromofluorobenzene-FID	81.6	50-150	%	11/30/1999 06:38	

CHROMALAB, INC.

Environmental Services (SDB)

Submission #: 1999-11-0390

To: **West World Environmental**

Attn.: Steve Michelson

Test Method: 8015M 8020

Prep Method: 5030

Batch QC Report

Gas/BTEX and MTBE

Method Blank | **Water** | **QC Batch # 1999/12/01-01.01**

MB: 1999/12/01-01.01-001 | Date Extracted: 12/01/1999 05:21

Compound	Result	Rep.Limit	Units	Analyzed	Flag
Gasoline	ND	50	ug/L	12/01/1999 05:21	
Benzene	ND	0.5	ug/L	12/01/1999 05:21	
Toluene	ND	0.5	ug/L	12/01/1999 05:21	
Ethyl benzene	ND	0.5	ug/L	12/01/1999 05:21	
Xylene(s)	ND	0.5	ug/L	12/01/1999 05:21	
MTBE	ND	5.0	ug/L	12/01/1999 05:21	
Surrogate(s)					
Trifluorotoluene	106.8	58-124	%	12/01/1999 05:21	
4-Bromofluorobenzene-FID	79.8	50-150	%	12/01/1999 05:21	

CHROMALAB, INC.

Environmental Services (SDB)

Submission #: 1999-11-0390

To: **West World Environmental**

Attn: Steve Michelson

Test Method: 8015M 8020

Prep Method: 5030

Batch QC Report

Gas/BTEX and MTBE

Laboratory Control Spike (LCS/LCSD) **Water** **QC Batch # 1999/11/30-01.01**

LCS: 1999/11/30-01.01-002 Extracted: 11/30/1999 04:46 Analyzed: 11/30/1999 04:46

LCSD: 1999/11/30-01.01-003 Extracted: 11/30/1999 05:14 Analyzed: 11/30/1999 05:14

Compound	Conc. [ug/L]		Exp.Conc. [ug/L]		Recovery [%]		RPD	Ctrl. Limits [%]		Flags	
	LCS	LCSD	LCS	LCSD	LCS	LCSD	[%]	Recovery	RPD	LCS	LCSD
Gasoline	557	480	500	500	111.4	96.0	14.9	75-125	20		
Benzene	119	121	100.0	100.0	119.0	121.0	1.7	77-123	20		
Toluene	118	121	100.0	100.0	118.0	121.0	2.5	78-122	20		
Ethyl benzene	120	124	100.0	100.0	120.0	124.0	3.3	70-130	20		
Xylene(s)	361	371	300	300	120.3	123.7	2.8	75-125	20		
Surrogate(s)											
Trifluorotoluene	580	613	500	500	116.0	122.6		58-124			
4-Bromofluorobenzene-FI	453	390	500	500	90.6	78.0		50-150			

CHROMALAB, INC.

Environmental Services (SDB)

Submission #: 1999-11-0390

To: **West World Environmental**

Attn: Steve Michelson

Test Method: 8015M 8020

Prep Method: 5030

Batch QC Report

Gas/BTEX and MTBE

Laboratory Control Spike (LCS/LCSD) **Water** **QC Batch # 1999/12/01-01.01**

LCS: 1999/12/01-01.01-002 Extracted: 12/01/1999 05:49 Analyzed: 12/01/1999 05:49

LCSD: 1999/12/01-01.01-003 Extracted: 12/01/1999 06:16 Analyzed: 12/01/1999 06:16

Compound	Conc. [ug/L]		Exp.Conc. [ug/L]		Recovery [%]		RPD	Ctrl. Limits [%]		Flags	
	LCS	LCSD	LCS	LCSD	LCS	LCSD	[%]	Recovery	RPD	LCS	LCSD
Gasoline	554	508	500	500	110.8	101.6	8.7	75-125	20		
Benzene	109	114	100.0	100.0	109.0	114.0	4.5	77-123	20		
Toluene	111	113	100.0	100.0	111.0	113.0	1.8	78-122	20		
Ethyl benzene	110	115	100.0	100.0	110.0	115.0	4.4	70-130	20		
Xylene(s)	333	347	300	300	111.0	115.7	4.1	75-125	20		
Surrogate(s)											
Trifluorotoluene	571	617	500	500	114.2	123.4		58-124			
4-Bromofluorobenzene-FI	465	413	500	500	93.0	82.6		50-150			

CHROMALAB, INC.

Environmental Services (SDB)

Submission #: 1999-11-0390

To: **West World Environmental**

Test Method: 8015M
8020

Attn: Steve Michelson

Prep Method: 5030

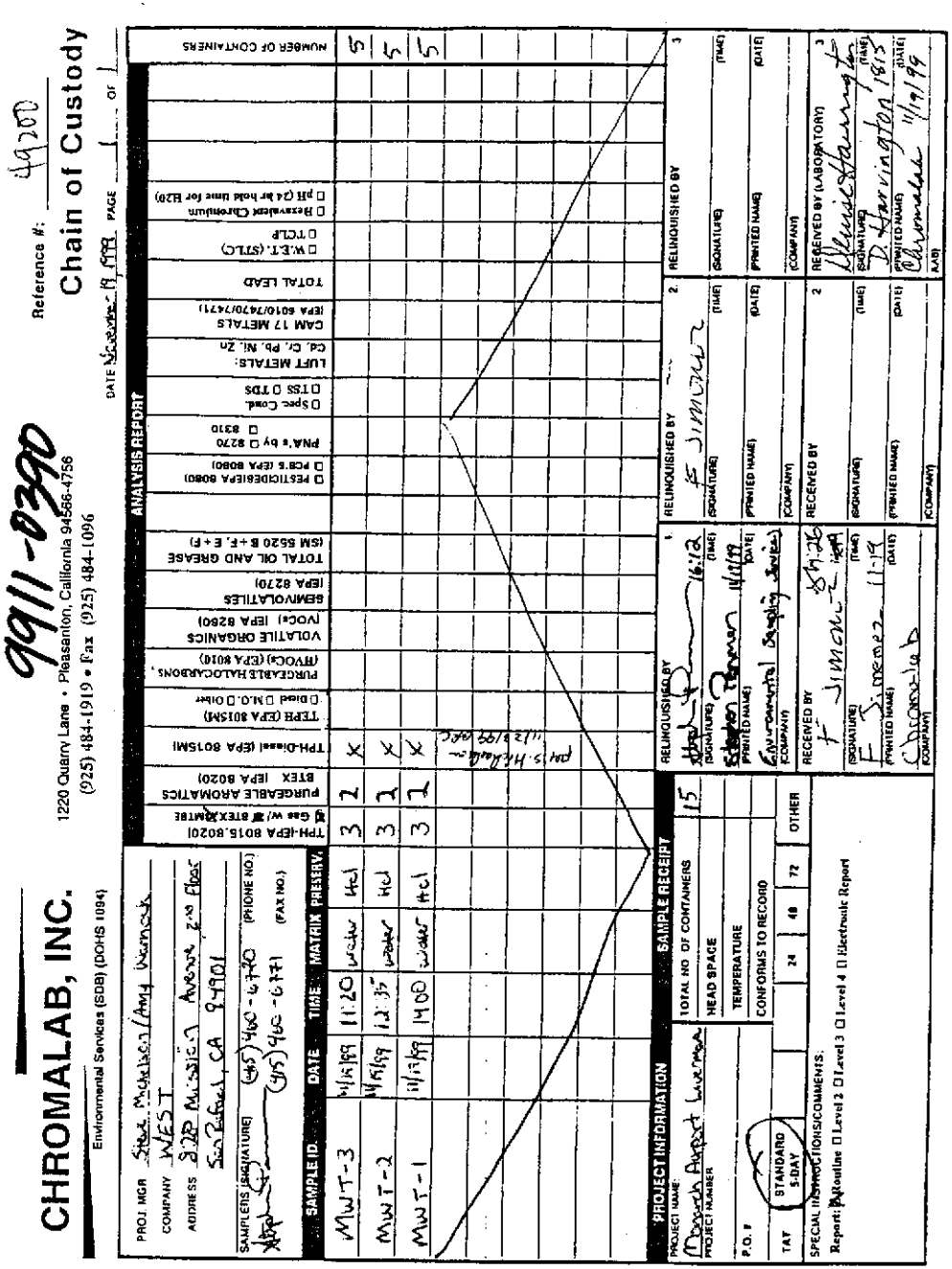
Legend & Notes

Gas/BTEX and MTBE

Analyte Flags

g

Hydrocarbon reported in the gasoline range does not match our gasoline standard.



World Environmental
Services & Technology

GROUND WATER QUALITY SAMPLE COLLECTION
FIELD DATA SHEET

Location ID: MWT-1 **Date:** 2-3-99

Sampled By: SIM / JG **Time:** 1230/Sample 1530

Project/Site Name: Monarch **Project No:**

Location type: monitoring well, supply well, soil boring, other

Sampling Method: Bailer

Weather (Skies, temperature, wind): Clear, 60's, calm

Well Diamter (in) 2"

Well Elevation (ft)

Well Casing Depth (ft) 63.85

Depth to Water

before sampling (ft) 29.85, 29.84

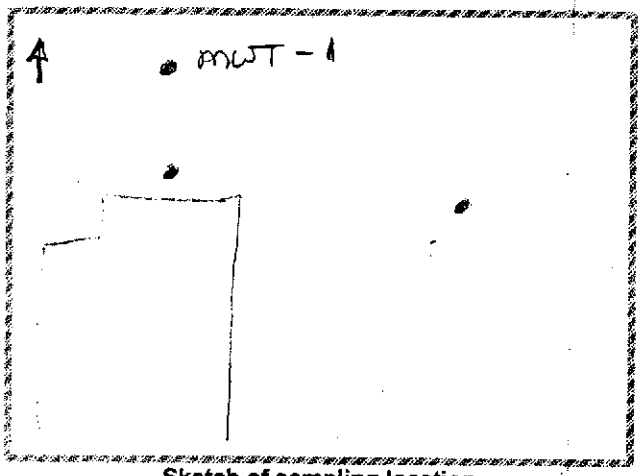
after sampling (ft)

Standing Water Volume (gal) 5.3

Purge Rate: (gal/min)

Purge Method: Bailer

Bail rate keeping pace w/ recharge ∴ bail 1X volume



Sketch of sampling location

Analyses Requested (parameters/methods): TPHg / TPHd / TPH oxygenates

BTEX, 1,2 DCA, Lead - filtered

Measurements of Water Levels and Field Parameters: (Turbidity: 10m)

Time (24 hr)	Depth to Water (ft)	Purge Volume (gal)	Temp (deg F)	pH	Elect. Cond. (µmhos)	Turbidity	Dissolved Oxygen (mg/L)	Remarks
1505		4 1/2	66.3	6.63	3260			
1513		7 1/2	64.7	6.46	3250			
1520		9	63.0	6.57	3040			

2-inch casing = 0.16 gallons/foot
7.48 gallons per cubic foot

4-inch casing = 0.65 gallons/foot

6 inch casing = 1.47 gallons/foot

World Environmental
Services & Technology

GROUND WATER QUALITY SAMPLE COLLECTION FIELD DATA SHEET

Location ID: MWT-2 **Date:** 2-3-99

Sampled By: Sim / JG **Time:** 12:40/Sampled 10:40

Project/Site Name: Monarch **Project No:**

Location type: monitoring well, supply well, soil boring, other

Sampling Method: Bailer

Weather (Skies, temperature, wind): Clear, 60's, Calm

Well Diamter (in) 2"

Well Elevation (ft)

Well Casing Depth (ft) 48.9

Depth to Water

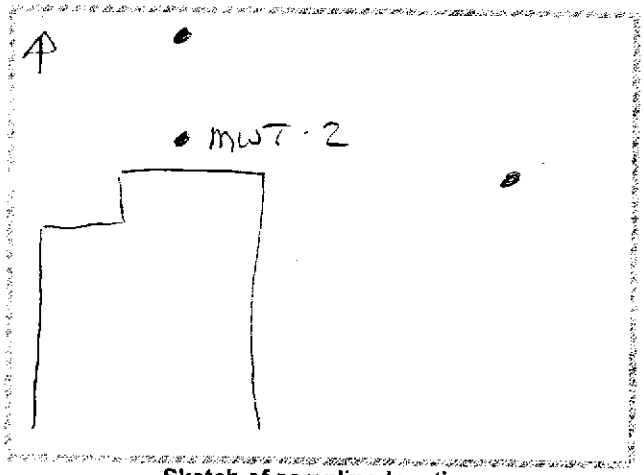
before sampling (ft) 29.30 29.30

after sampling (ft)

Standing Water Volume (gal) 3.1 gal

Purge Rate: (gal/min)

Purge Method: Bailer



Sketch of sampling location

Analyses Requested (parameters/methods): TPHg / TPHd / TPH-lube
BTEX, 1,2-DCA, Lead- filtered

Measurements of Water Levels and Field Parameters:

Time (24 hr)	Depth to Water (ft)	Purge Volume (gal)	Temp (deg F)	pH	Elect. Cond. (µmhos)	Turbidity	Dissolved Oxygen (mg/L)	Remarks
1419		4 1/2	62.1	7.15	2210			wtr is black
1420		6 1/2	66.5	7.14	2360			"
1436		9 1/2	66.5	7.03	2580			"

2-inch casing = 0.16 gallons/foot
7.48 gallons per cubic foot

4-inch casing = 0.65 gallons/foot

6 inch casing = 1.47 gallons/foot

World Environmental
Services & Technology

GROUND WATER QUALITY SAMPLE COLLECTION FIELD DATA SHEET

Location ID: MW-3 **Date:** 2-3-99

Sampled By: SM/JG **Time:** 1250/Sample 1325

Project/Site Name: Monarch **Project No:**

Location type: monitoring well, supply well, soil boring, other

Sampling Method: Bailer

Weather (Skies, temperature, wind): Clear 60's Calm

Well Diamter (in) 2"

Well Elevation (ft)

Well Casing Depth (ft) 42.3

Depth to Water

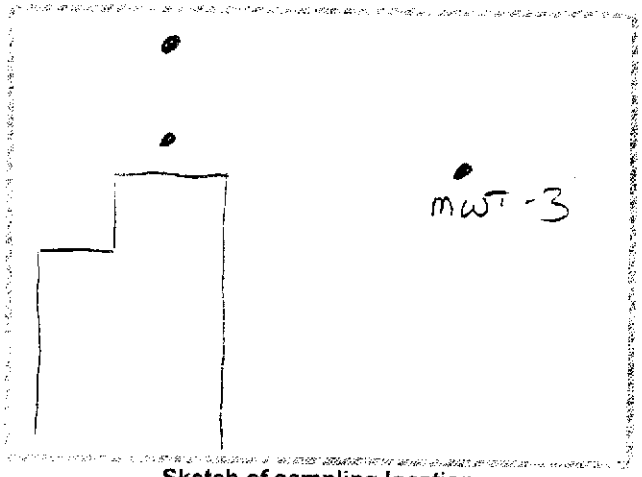
before sampling (ft) 28.10 & 28.10

after sampling (ft)

Standing Water Volume (gal) 2.2

Purge Rate: (gal/min)

Purge Method: Bailer



Sketch of sampling location

Almost bailed dry. Bailed ~6.5 gals + sampled.

Analyses Requested (parameters/methods): TPHg/TPHd/Trihalogens BTEX, 1,2-DCA, Lead - filtered

Measurements of Water Levels and Field Parameters:

Time (24 hr)	Depth to Water (ft)	Purge Volume (gal)	Temp (deg F)	pH	Elect. Cond. (µmhos/cm)	Turbidity	Dissolved Oxygen (mg/L)	Remarks
1325		5	63.0	6.81	3720			
1330		6	64.6	6.96	3640			
1333		6 1/2	64.1	7.06	3570			

2-inch casing = 0.16 gallons/foot
7.48 gallons per cubic foot

4-inch casing = 0.65 gallons/foot

6 inch casing = 1.47 gallons/foot

WEST

GROUND WATER QUALITY SAMPLE COLLECTION FIELD DATA SHEET

Location ID: MWT-1 Date: 8/27/99

Sampled By: Stephen Penman (Environmental Sampling Services) Sampling Time: 15:45

Project/Site Name: Monarch Project No:

Location type: (monitoring well) supply well, soil boring, other

Sampling Method: Disposable PVC Bailer

Weather (Skies, temperature, wind): Clear, Hot and a light breeze

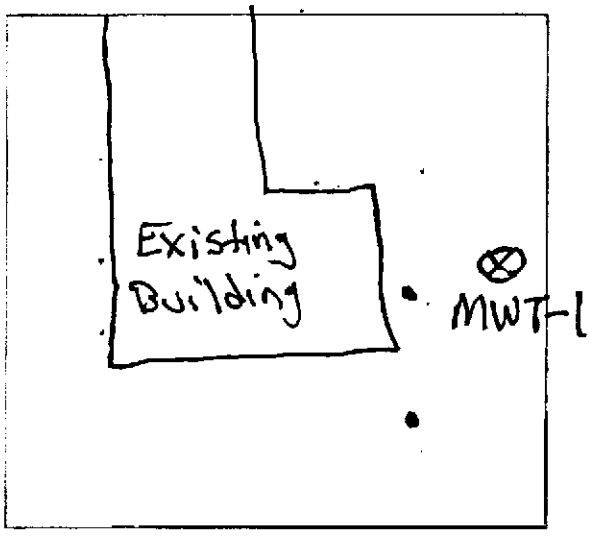
Well Diameter (in) 2"

Well Elevation (ft)

Well Casing Depth (ft) 64.11

Depth to Water (ft) 30.43

Before Sampling	After Sampling
33.25↑	33.0



Sketch of sampling location

Standing Water Volume (gal) 5.4

Purge Rate: (gal/min) NA

Purge Method: Disposable PVC Bailer

Analyses Requested (parameters/methods): TPH gas/BTEX and TAH D

Measurements of Water Levels and Field Parameters:

Time (24 hr)	Depth to Water (ft)	Purge Volume (gal)	Temp (°F) (°C)	pH	E. Cond. (µmhos/cm)	Turbidity (ntus)	Dissolved Oxygen (mg/L)	Remarks
15:02		5	22	7.32	1433	44.5	4.65	
15:11		9	21.6	7.31	1476	23.6	5.30	
15:22		13	21.7	7.31	1529	24.6	5.36	
15:33		17	21.5	7.30	1583	22.6	5.31	

2-inch casing = 0.16 gallons/foot 4-inch casing = 0.65 gallons/foot 6 inch casing = 1.47 gallons/foot
7.48 gallons per cubic foot

WEST

GROUND WATER QUALITY SAMPLE COLLECTION FIELD DATA SHEET

Location ID: MWT-2 Date: 8/27/99

Sampled By: Stephen Penman (Environmental Sampling Services) Sampling Time: 14:35

Project/Site Name: Monarch Project No:

Location type: (monitoring well) supply well, soil boring, other

Sampling Method: Disposable PVC Bailer

Weather (Skies, temperature, wind): Clear, Hot and a Light Breeze

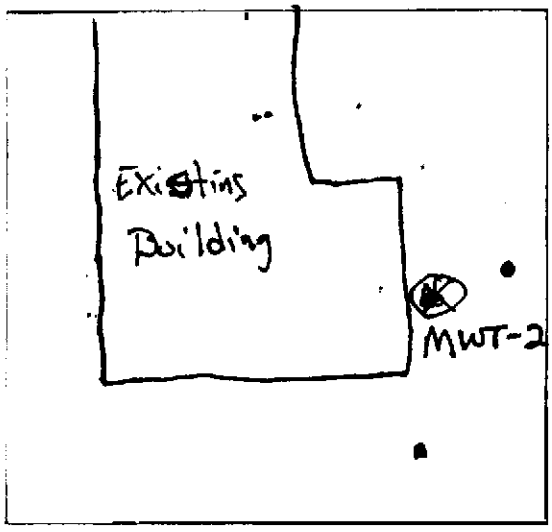
Well Diameter (in) 2"

Well Elevation (ft)

Well Casing Depth (ft) 49.26

Depth to Water (ft) 29.75

Before Sampling	After Sampling
35.35 ↑	33.21 ↑



Sketch of sampling location

Standing Water Volume (gal) 3.1

Purge Rate: (gal/min) NA

Purge Method: Disposable PVC Bailer

Analyses Requested (parameters/methods): TPH gas/BTEX and TPH D

Measurements of Water Levels and Field Parameters:

Time (24 hr)	Depth to Water (ft)	Purge Volume (gal)	Temp (°F) (°C)	pH	E. Cond. (µmhos/cm)	Turbidity (ntus)	Dissolved Oxygen (mg/L)	Remarks
14:09		2.5	22.5	7.09	1763	128	1.17	Petroleum odor light sheen on water
14:17		5.0	21.0	7.14	1548	48.2	1.28	↓
14:24		7.5	21.1	7.16	1558	49.6	1.06	
14:31		10.0	21.3	7.16	1621	28.0	1.18	↓

2-inch casing = 0.16 gallons/foot 4-inch casing = 0.65 gallons/foot 6 inch casing = 1.47 gallons/foot
7.48 gallons per cubic foot

WEST

GROUND WATER QUALITY SAMPLE COLLECTION FIELD DATA SHEET

Location ID: MWT-3 Date: 8/27/99

Sampled By: Stephen Penman (Environmental sampling Services) Sampling Time: 13:40

Project/Site Name: Monarch Project No:

Location type: (monitoring well) supply well, soil boring, other

Sampling Method: PVC Disposable Bailer

Weather (Skies, temperature, wind): Clear, Hot and a light breeze

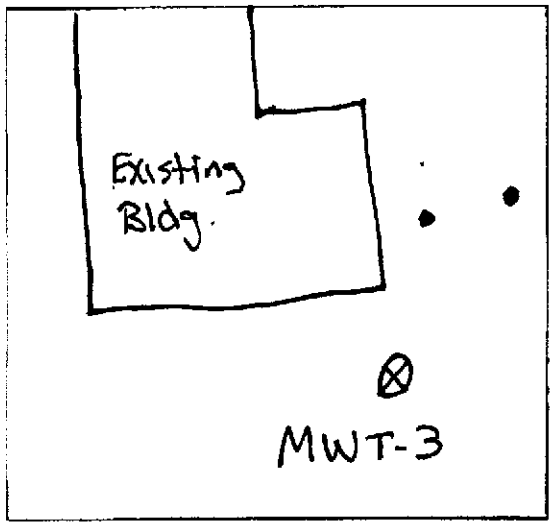
Well Diameter (in) 2"

Well Elevation (ft)

Well Casing Depth (ft) 43.39

Depth to Water (ft) 28.61

Before Sampling	After Sampling
28.87	28.92



Sketch of sampling location

Standing Water Volume (gal) 2.4

Purge Rate: (gal/min) NA

Purge Method: PVC Disposable Bailer

Analyses Requested (parameters/methods): TPH gas/BTEX and TPH Diesel

Measurements of Water Levels and Field Parameters:

Time (24 hr)	Depth to Water (ft)	Purge Volume (gal)	Temp (°F) (°C)	pH	E. Cond. (µmhos/cm)	Turbidity (ntus)	Dissolved Oxygen (mg/L)	Remarks
13:16		2.0	22.0	7.30	1410	63.5	1.69	
13:22		4.0	20.9	7.24	1453	102.7	2.23	
13:30		6.0	20.5	7.21	1425	981	2.88	
13:36		8.0	20.8	7.23	1448	815	3.08	

2-inch casing = 0.16 gallons/foot 4-inch casing = 0.65 gallons/foot 6 inch casing = 1.47 gallons/foot
7.48 gallons per cubic foot

CHROMALAB, INC.

Environmental Services (SDB) (DOHS 1094)

1220 Quarry Lane • Pleasanton, California 94566-4756
(925) 484-1919 • Fax (925) 484-1096

Reference #: _____

Chain of Custod

DATE 8/27/99 PAGE 1 OF 1

PROJ MGR Steve Michelsen / Amy Womack
COMPANY WEST
ADDRESS 828 Mission Avenue 2nd floor
San Rafael, CA 94901
SAMPLERS (SIGNATURE) (415) 460-6770 (PHONE NO.)
(415) 460-6771 (FAX NO.)

ANALYSIS REPORT

SAMPLE ID.	DATE	TIME	MATRIX	PRESERV.	TPH-(EPA 8015, 8020) ☒ Gas w/ ☒ BTEX ☐ MTBE	PURGEABLE AROMATICS BTEX (EPA 8020)	TPH-Diesel (EPA 8015M)	TEPH (EPA 8015M) ☐ Diesel ☐ M.O. ☐ Other	PURGEABLE HALOCARBONS (HVOCs) (EPA 8010)	VOLATILE ORGANICS (VOCs) (EPA 8260)	SEMIVOLATILES (EPA 8270)	TOTAL OIL AND GREASE (SM 5520 B+F, E+F)		☐ PESTICIDES (EPA 8080) ☐ PCB'S (EPA 8080)	PNA's by ☐ 8270 ☐ 8310	☐ Spec. Cond. ☐ TSS ☐ TDS	LUFT METALS: Cd, Cr, Pb, Ni, Zn	CAM 17 METALS (EPA 6010/7470/7471)	TOTAL LEAD	☐ W.E.T. (STLC) ☐ TCLP	☐ Hexavalent Chromium ☐ pH (24 hr hold time for H20)				NUMBER OF CONTAINERS
MWT-3	8/27/99	13:40	Water	HCl	3		1																		4
MWT-2	8/27/99	14:35	Water	HCl	3		1																		4
MWT-1	8/27/99	15:45	Water	HCl	3		1																		4

PROJECT INFORMATION

PROJECT NAME: Monarch
PROJECT NUMBER
P.O. #

SAMPLE RECEIPT

TOTAL NO. OF CONTAINERS
HEAD SPACE
TEMPERATURE
CONFORMS TO RECORD

TAT: STANDARD 5-DAY | 24 | 48 | 72 | OTHER

SPECIAL INSTRUCTIONS/COMMENTS:
Report: ☒ Routine ☐ Level 2 ☐ Level 3 ☐ Level 4 ☐ Electronic Report

RELINQUISHED BY 1.	RELINQUISHED BY 2.	RELINQUISHED BY
(SIGNATURE) 16:35 (TIME)	(SIGNATURE) (TIME)	(SIGNATURE) (TIME)
Stephen Penman 8/27/99 (PRINTED NAME) (DATE)	(PRINTED NAME) (DATE)	(PRINTED NAME) (DATE)
Environmental Sampling Svcs (COMPANY)	(COMPANY)	(COMPANY)
RECEIVED BY 1.	**RECEIVED BY 2.**	**RECEIVED BY (LABORATORY)**
(SIGNATURE) (TIME)	(SIGNATURE) (TIME)	Denise Harrington (SIGNATURE) (TIME)
(PRINTED NAME) (DATE)	(PRINTED NAME) (DATE)	D. Harrington 1630 (PRINTED NAME) (DATE)
(COMPANY)	(COMPANY)	Chromalab 8/27/99 (LAB)

JAN 0 7 2000

File 3- GW Monitoring

WEST

GROUND WATER QUALITY SAMPLE COLLECTION FIELD DATA SHEET

Location ID: MWT-3 **Date:** 11/19/99

Sampled By: Stephen Penman (Environmental Sampling Services) **Sampling Time:** 11:20

Project/Site Name: Monarch Airport **Project No:**

Location type: (monitoring well,) supply well, soil boring, other

Sampling Method: PVC Disposable Bailer

Weather (Skies, temperature, wind): Overcast Light Showers and Cool

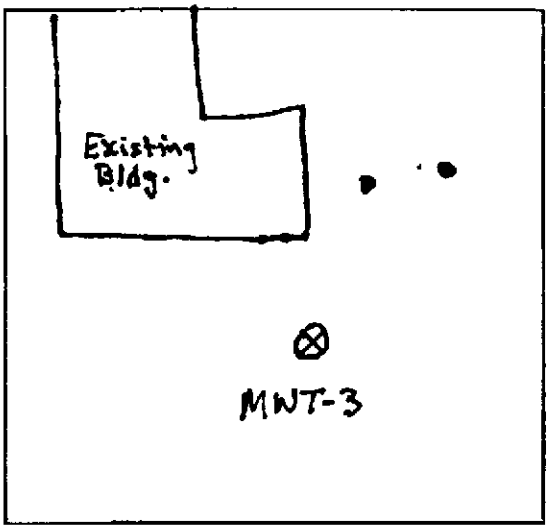
Well Diameter (in) 2"

Well Elevation (ft)

Well Casing Depth (ft) 43.39

Depth to Water (ft) 29.37

Before Sampling	After Sampling
30.35	30.18



Sketch of sampling location

Standing Water Volume (gal) 2.2

Purge Rate: (gal/min)

Purge Method: PVC Disposable Bailer

Analyses Requested (parameters/methods): 8015/8020 TPH gas/BTEX; 8015M TPH Diesel

Measurements of Water Levels and Field Parameters:

Time (24 hr)	Depth to Water (ft)	Purge Volume (gal)	Temp (°F)	pH	E. Cond. (µmhos/cm)	Turbidity (ntus)	Dissolved Oxygen (mg/L)	Remarks
10:51	NA	1.0	18.3	7.18	1766	60.0	1.57	Cloudy Gray
11:00	↓	3.0	18.8	7.16	1551	216	2.00	Cloudy Lt. Brown Fine Sands
11:06	↓	5.0	18.8	7.18	1635	302	2.79	↓
11:14	↓	7.0	18.7	7.19	1672	502	2.86	↓

2-inch casing = 0.16 gallons/foot
7.48 gallons per cubic foot

4-inch casing = 0.65 gallons/foot

6 inch casing = 1.47 gallons/foot

WEST

GROUND WATER QUALITY SAMPLE COLLECTION FIELD DATA SHEET

Location ID: MWT-2 **Date:** 11/19/99

Sampled By: Stephen Penman (Environmental Sampling Services) **Sampling Time:** 12:35

Project/Site Name: Monarch Airport Livermore **Project No:**

Location type: (monitoring well,) supply well, soil boring, other

Sampling Method: Disposable PVC Bailer

Weather (Skies, temperature, wind): Raining and cool

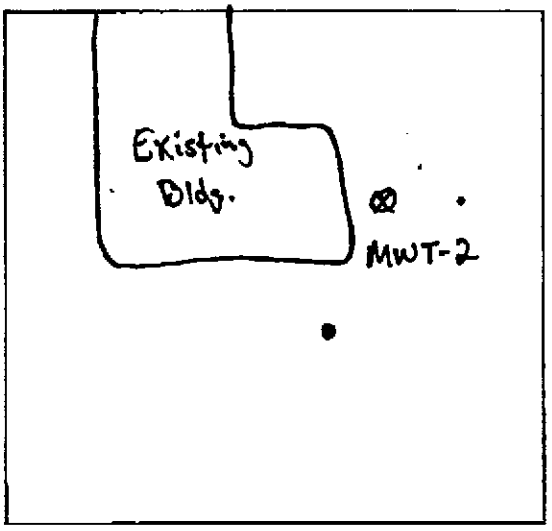
Well Diameter (in) 2"

Well Elevation (ft)

Well Casing Depth (ft) 49.26

Depth to Water (ft) 30.55

Before Sampling	After Sampling
35.60 ↑	33.89 ↑



Sketch of sampling location

Standing Water Volume (gal) 2.99

Purge Rate: (gal/min)

Purge Method: Disposable PVC Bailer

Analyses Requested (parameters/methods): TPH gas/BTEX 8015/8020; TPH Diesel 8015M

Measurements of Water Levels and Field Parameters:

Time (24 hr)	Depth to Water (ft)	Purge Volume (gal)	Temp (°F) (°C)	pH	E. Cond. (µmhos/cm)	Turbidity (ntus)	Dissolved Oxygen (mg/L)	Remarks
12:06	NA	3.0	18.2	7.18	1618	50.9	.66	Light odor, sheen on water Black, suspended sl
12:14		5.0	18.8	7.18	1589	65.9	1.30	
12:21		7.0	18.7	7.19	1535	51.7	1.05	
12:28	↓	9.0	18.7	7.21	1561	35.7	1.54	↓

2-inch casing = 0.16 gallons/foot
7.48 gallons per cubic foot

4-inch casing = 0.65 gallons/foot

6 inch casing = 1.47 gallons/foot

WEST

GROUND WATER QUALITY SAMPLE COLLECTION FIELD DATA SHEET

Location ID: MWT-1 Date: 11/19/99

Sampled By: ~~Stephen Pearson~~ (Environmental Sampling Services) Sampling Time: 14:00

Project/Site Name: Monarch Airport Livermore Project No: _____

Location type: (monitoring well,) supply well, soil boring, other _____

Sampling Method: Disposable PVC Bailer

Weather (Skies, temperature, wind): Raining cool and windy

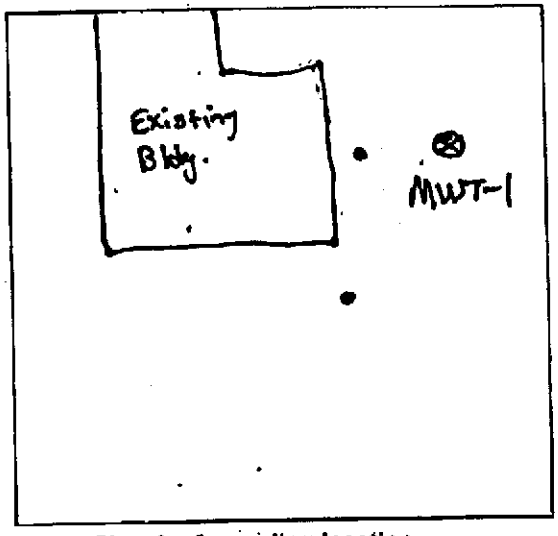
Well Diameter (in) 2"

Well Elevation (ft) _____

Well Casing Depth (ft) 64.11

Depth to Water (ft) 31.20

Before Sampling	After Sampling
36.91	35.17



Sketch of sampling location

Standing Water Volume (gal) 5.3

Purge Rate: (gal/min) _____

Purge Method: Disposable PVC Bailer

Analyses Requested (parameters/methods): TPH gas/BTEX 8015/8020 ; TPH Diesel 8015M

Measurements of Water Levels and Field Parameters:

Time (24 hr)	Depth to Water (ft)	Purge Volume (gal)	Temp (°F) (°C)	pH	E. Cond. (µmhos/cm)	Turbidity (ntus)	Dissolved Oxygen (mg/L)	Remarks
13:25	NA	4.0	18.1	7.49	1251	71.9	4.88	Cloudy Lt. Brown
13:34	↓	8.0	18.4	7.53	1323	22.6	4.45	Clear
13:47	↓	12.0	18.3	7.36	M32	24.3	4.97	Cloudy Lt. Brown
13:57	↓	16.0	18.1	7.40	M39	89.4	5.30	↓

2-inch casing = 0.16 gallons/foot
7.48 gallons per cubic foot

4-inch casing = 0.65 gallons/foot

6 inch casing = 1.47 gallons/foot

CHROMALAB, INC.

Environmental Services (SDB)

February 10, 1999 *Submission #:* 9902047

W.E.S.T, WORLD ENVIRONMENTAL

Atten: Peter Krasnoff

Project: MONARCH
Received: February 3, 1999

re: One sample for Gasoline BTEX analysis.
Method: SW846 8020A Nov 1990 / 8015Mod

Client Sample ID: **MWT-1**
Spl#: 227389 *Matrix:* WATER
Sampled: February 3, 1999 *Run#:*17270 *Analyzed:* February 4, 1999

ANALYTE	RESULT (ug/L)	REPORTING LIMIT (ug/L)	BLANK RESULT (ug/L)	BLANK SPIKE (%)	DILUTION FACTOR
GASOLINE	13000	2500	N.D.	94	50
BENZENE	220	25	N.D.	97	50
TOLUENE	110	25	N.D.	96	50
ETHYL BENZENE	2200	25	N.D.	96	50
XYLENES	2800	25	N.D.	92	50

Vincent Vancil
Analyst

Michael Verona
Operations Manager

415-485-6062

1220 Quarry Lane • Pleasanton, California 94566-4756
(925) 484-1919 • Facsimile (925) 484-1096
Federal ID #68-0140157

GC V132 O:BTEXQC022C
CRAIG 10:02

CHROMALAB, INC.

Environmental Services (SDB)

February 10, 1999 *Submission #:* 9902047

W.E.S.T, WORLD ENVIRONMENTAL

Atten: Peter Krasnoff

Project: MONARCH
Received: February 3, 1999

re: One sample for Gasoline BTEX analysis.
Method: SW846 8020A Nov 1990 / 8015Mod

Client Sample ID: **MWT-2**
Spl#: 227390 *Matrix:* WATER
Sampled: February 3, 1999 *Run#:*17270 *Analyzed:* February 4, 1999

ANALYTE	RESULT (ug/L)	REPORTING LIMIT (ug/L)	BLANK RESULT (ug/L)	BLANK SPIKE (%)	DILUTION FACTOR
GASOLINE	N.D.	50	N.D.	94	1
BENZENE	N.D.	0.50	N.D.	97	1
TOLUENE	N.D.	0.50	N.D.	96	1
ETHYL BENZENE	N.D.	0.50	N.D.	96	1
XYLENES	N.D.	0.50	N.D.	92	1

Vincent Vancil
Analyst

Michael Verona
Operations Manager

1220 Quarry Lane • Pleasanton, California 94566-4756
(925) 484-1919 • Facsimile (925) 484-1096
Federal ID #68-0140157

CHROMALAB, INC.

Environmental Services (SDB)

February 10, 1999 *Submission #:* 9902047

W.E.S.T, WORLD ENVIRONMENTAL

Atten: Peter Krasnoff

Project: MONARCH
Received: February 3, 1999

re: One sample for Gasoline BTEX analysis.
Method: SW846 8020A Nov 1990 / 8015Mod

Client Sample ID: **MWT-3**
Spl#: 227391 *Matrix:* WATER
Sampled: February 3, 1999 *Run#:*17270 *Analyzed:* February 4, 1999

ANALYTE	RESULT (ug/L)	REPORTING LIMIT (ug/L)	BLANK RESULT (ug/L)	BLANK SPIKE (%)	DILUTION FACTOR
GASOLINE	N.D.	50	N.D.	94	1
BENZENE	N.D.	0.50	N.D.	97	1
TOLUENE	N.D.	0.50	N.D.	96	1
ETHYL BENZENE	N.D.	0.50	N.D.	96	1
XYLENES	N.D.	0.50	N.D.	92	1

Vincent Vancil
Analyst

Michael Verona
Operations Manager

1220 Quarry Lane • Pleasanton, California 94566-4756
(925) 484-1919 • Facsimile (925) 484-1096
Federal ID #68-0140157

CHROMALAB, INC.

Environmental Services (SDB)

February 10, 1999 *Submission #:* 9902047

W.E.S.T, WORLD ENVIRONMENTAL

Atten: Peter Krasnoff

Project: MONARCH
Received: February 3, 1999

re: One sample for Gasoline BTEX analysis.
Method: SW846 8020A Nov 1990 / 8015Mod

Client Sample ID: **TRIP BLANK**
Spl#: 227392 *Matrix:* WATER
Sampled: February 3, 1999 *Run#:*17270 *Analyzed:* February 4, 1999

ANALYTE	RESULT (ug/L)	REPORTING LIMIT (ug/L)	BLANK RESULT (ug/L)	BLANK SPIKE (%)	DILUTION FACTOR
GASOLINE	N.D.	50	N.D.	94	1
BENZENE	N.D.	0.50	N.D.	97	1
TOLUENE	N.D.	0.50	N.D.	96	1
ETHYL BENZENE	N.D.	0.50	N.D.	96	1
XYLENES	N.D.	0.50	N.D.	92	1

Vincent Vancil
Analyst

Michael Verona
Operations Manager

1220 Quarry Lane • Pleasanton, California 94566-4756
(925) 484-1919 • Facsimile (925) 484-1096
Federal ID #68-0140157

CHROMALAB, INC.

Environmental Services (SDB)

February 5, 1999 *Submission #:* 9902047

W.E.S.T, WORLD ENVIRONMENTAL

Atten: Peter Krasnoff

Project: MONARCH
Received: February 3, 1999

re: One sample for Volatile Halogenated Organics analysis.
Method: *SW846 Method 8010A July 1992*

Client Sample ID: **MWT-1**
Spl#: 227389 *Matrix:* WATER
Sampled: February 3, 1999 *Run#:* 17274 *Analyzed:* February 4, 1999

ANALYTE	RESULT (ug/L)	REPORTING LIMIT (ug/L)	BLANK RESULT (ug/L)	BLANK SPIKE (%)	DILUTION FACTOR
VINYL CHLORIDE	N.D.	0.50	N.D.	--	1
CHLOROETHANE	N.D.	0.50	N.D.	--	1
TRICHLOROFLUOROMETHANE	N.D.	0.50	N.D.	--	1
1,1-DICHLOROETHENE	N.D.	0.50	N.D.	105	1
METHYLENE CHLORIDE	N.D.	5.0	N.D.	--	1
TRANS-1,2-DICHLOROETHENE	N.D.	0.50	N.D.	--	1
CIS-1,2-DICHLOROETHENE	N.D.	0.50	N.D.	--	1
1,1-DICHLOROETHANE	N.D.	0.50	N.D.	--	1
CHLOROFORM	N.D.	3.0	N.D.	--	1
1,1,1-TRICHLOROETHANE	N.D.	0.50	N.D.	--	1
CARBON TETRACHLORIDE	N.D.	0.50	N.D.	--	1
1,2-DICHLOROETHANE	N.D.	0.50	N.D.	--	1
TRICHLOROETHENE	N.D.	0.50	N.D.	95.5	1
1,2-DICHLOROPROPANE	N.D.	0.50	N.D.	--	1
BROMODICHLOROMETHANE	N.D.	0.50	N.D.	--	1
2-CHLOROETHYL VINYL ETHER	N.D.	0.50	N.D.	--	1
TRANS-1,3-DICHLOROPROPENE	N.D.	0.50	N.D.	--	1
CIS-1,3-DICHLOROPROPENE	N.D.	0.50	N.D.	--	1
1,1,2-TRICHLOROETHANE	N.D.	0.50	N.D.	--	1
TETRACHLOROETHENE	N.D.	0.50	N.D.	--	1
DIBROMOCHLOROMETHANE	N.D.	0.50	N.D.	--	1
CHLOROBENZENE	N.D.	0.50	N.D.	123	1
BROMOFORM	N.D.	2.0	N.D.	--	1
1,1,2,2-TETRACHLOROETHANE	N.D.	0.50	N.D.	--	1
1,3-DICHLOROBENZENE	N.D.	0.50	N.D.	--	1
1,4-DICHLOROBENZENE	N.D.	0.50	N.D.	--	1
1,2-DICHLOROBENZENE	N.D.	0.50	N.D.	--	1
TRICHLOROTRIFLUOROETHANE	N.D.	2.0	N.D.	--	1
CHLOROMETHANE	N.D.	1.0	N.D.	--	1
BROMOMETHANE	N.D.	1.0	N.D.	--	1
DICHLORODIFLUOROMETHANE	N.D.	1.0	N.D.	--	1

Vincent Vancil
Analyst

Michael Verona
Operations Manager

CHROMALAB, INC.

Environmental Services (SDB)

February 5, 1999 *Submission #:* 9902047

W.E.S.T, WORLD ENVIRONMENTAL

Atten: Peter Krasnoff

Project: MONARCH
Received: February 3, 1999

re: One sample for Volatile Halogenated Organics analysis.
Method: *SW846 Method 8010A July 1992*

Client Sample ID: **MWT-2**
Spl#: 227390 *Matrix:* WATER
Sampled: February 3, 1999 *Run#:* 17274 *Analyzed:* February 4, 1999

ANALYTE	RESULT (ug/L)	REPORTING LIMIT (ug/L)	BLANK RESULT (ug/L)	BLANK SPIKE (%)	DILUTION FACTOR
VINYL CHLORIDE	N.D.	0.50	N.D.	--	1
CHLOROETHANE	N.D.	0.50	N.D.	--	1
TRICHLOROFLUOROMETHANE	N.D.	0.50	N.D.	--	1
1,1-DICHLOROETHENE	N.D.	0.50	N.D.	105	1
METHYLENE CHLORIDE	N.D.	5.0	N.D.	--	1
TRANS-1,2-DICHLOROETHENE	N.D.	0.50	N.D.	--	1
CIS-1,2-DICHLOROETHENE	N.D.	0.50	N.D.	--	1
1,1-DICHLOROETHANE	N.D.	0.50	N.D.	--	1
CHLOROFORM	N.D.	3.0	N.D.	--	1
1,1,1-TRICHLOROETHANE	N.D.	0.50	N.D.	--	1
CARBON TETRACHLORIDE	N.D.	0.50	N.D.	--	1
1,2-DICHLOROETHANE	N.D.	0.50	N.D.	--	1
TRICHLOROETHENE	N.D.	0.50	N.D.	95.5	1
1,2-DICHLOROPROPANE	N.D.	0.50	N.D.	--	1
BROMODICHLOROMETHANE	N.D.	0.50	N.D.	--	1
2-CHLOROETHYL VINYL ETHER	N.D.	0.50	N.D.	--	1
TRANS-1,3-DICHLOROPROPENE	N.D.	0.50	N.D.	--	1
CIS-1,3-DICHLOROPROPENE	N.D.	0.50	N.D.	--	1
1,1,2-TRICHLOROETHANE	N.D.	0.50	N.D.	--	1
TETRACHLOROETHENE	N.D.	0.50	N.D.	--	1
DIBROMOCHLOROMETHANE	N.D.	0.50	N.D.	--	1
CHLOROBENZENE	N.D.	0.50	N.D.	123	1
BROMOFORM	N.D.	2.0	N.D.	--	1
1,1,2,2-TETRACHLOROETHANE	N.D.	0.50	N.D.	--	1
1,3-DICHLOROBENZENE	N.D.	0.50	N.D.	--	1
1,4-DICHLOROBENZENE	N.D.	0.50	N.D.	--	1
1,2-DICHLOROBENZENE	N.D.	0.50	N.D.	--	1
TRICHLOROTRIFLUOROETHANE	N.D.	2.0	N.D.	--	1
CHLOROMETHANE	N.D.	1.0	N.D.	--	1
BROMOMETHANE	N.D.	1.0	N.D.	--	1
DICHLORODIFLUOROMETHANE	N.D.	1.0	N.D.	--	1

Vincent Vancil
Analyst

Michael Verona
Operations Manager

CHROMALAB, INC.

Environmental Services (SDB)

February 5, 1999 *Submission #:* 9902047

W.E.S.T, WORLD ENVIRONMENTAL

Atten: Peter Krasnoff

Project: MONARCH
Received: February 3, 1999

re: One sample for Volatile Halogenated Organics analysis.
Method: *SW846 Method 8010A July 1992*

Client Sample ID: **MWT-3**
Spl#: 227391 *Matrix:* WATER
Sampled: February 3, 1999 *Run#:* 17274 *Analyzed:* February 4, 1999

ANALYTE	RESULT (ug/L)	REPORTING LIMIT (ug/L)	BLANK RESULT (ug/L)	BLANK SPIKE (%)	DILUTION FACTOR
VINYL CHLORIDE	N.D.	0.50	N.D.	--	1
CHLOROETHANE	N.D.	0.50	N.D.	--	1
TRICHLOROFLUOROMETHANE	N.D.	0.50	N.D.	--	1
1,1-DICHLOROETHENE	N.D.	0.50	N.D.	105	1
METHYLENE CHLORIDE	N.D.	5.0	N.D.	--	1
TRANS-1,2-DICHLOROETHENE	N.D.	0.50	N.D.	--	1
CIS-1,2-DICHLOROETHENE	N.D.	0.50	N.D.	--	1
1,1-DICHLOROETHANE	N.D.	0.50	N.D.	--	1
CHLOROFORM	N.D.	3.0	N.D.	--	1
1,1,1-TRICHLOROETHANE	N.D.	0.50	N.D.	--	1
CARBON TETRACHLORIDE	N.D.	0.50	N.D.	--	1
1,2-DICHLOROETHANE	N.D.	0.50	N.D.	--	1
TRICHLOROETHENE	N.D.	0.50	N.D.	95.5	1
1,2-DICHLOROPROPANE	N.D.	0.50	N.D.	--	1
BROMODICHLOROMETHANE	N.D.	0.50	N.D.	--	1
2-CHLOROETHYL VINYL ETHER	N.D.	0.50	N.D.	--	1
TRANS-1,3-DICHLOROPROPENE	N.D.	0.50	N.D.	--	1
CIS-1,3-DICHLOROPROPENE	N.D.	0.50	N.D.	--	1
1,1,2-TRICHLOROETHANE	N.D.	0.50	N.D.	--	1
TETRACHLOROETHENE	N.D.	0.50	N.D.	--	1
DIBROMOCHLOROMETHANE	N.D.	0.50	N.D.	--	1
CHLOROBENZENE	N.D.	0.50	N.D.	123	1
BROMOFORM	N.D.	2.0	N.D.	--	1
1,1,2,2-TETRACHLOROETHANE	N.D.	0.50	N.D.	--	1
1,3-DICHLOROBENZENE	N.D.	0.50	N.D.	--	1
1,4-DICHLOROBENZENE	N.D.	0.50	N.D.	--	1
1,2-DICHLOROBENZENE	N.D.	0.50	N.D.	--	1
TRICHLOROTRIFLUOROETHANE	N.D.	2.0	N.D.	--	1
CHLOROMETHANE	N.D.	1.0	N.D.	--	1
BROMOMETHANE	N.D.	1.0	N.D.	--	1
DICHLORODIFLUOROMETHANE	N.D.	1.0	N.D.	--	1

Vincent Vancil
Analyst

Michael Verona
Operations Manager

CHROMALAB, INC.

Environmental Services (SDB)

February 10, 1999 *Submission #:* 9902047

W.E.S.T, WORLD ENVIRONMENTAL

Atten: Peter Krasnoff

Project: MONARCH
Received: February 3, 1999

re: One sample for Soluble Miscellaneous Metals with Mercury analysis.
Method: *EPA 3005A/6010A/7470A Nov 1990*

Client Sample ID: **MWT-1**
Spl#: 227389 *Matrix:* WATER *Extracted:* February 9, 1999
Sampled: February 3, 1999 *Run#:* 17314 *Analyzed:* February 1, 1998

ANALYTE	RESULT (mg/L)	REPORTING LIMIT (mg/L)	BLANK RESULT (mg/L)	BLANK SPIKE (%)	DILUTION FACTOR
LEAD	N.D.	0.0050	N.D.	104	1

Shafi Barekzai
Analyst

Michael Verona
Operations Manager

1220 Quarry Lane • Pleasanton, California 94566-4756
(925) 484-1919 • Facsimile (925) 484-1096
Federal ID #68-0140157

CHROMALAB, INC.

Environmental Services (SDB)

February 10, 1999 *Submission #:* 9902047

W.E.S.T, WORLD ENVIRONMENTAL

Atten: Peter Krasnoff

Project: MONARCH
Received: February 3, 1999

re: One sample for Soluble Miscellaneous Metals with Mercury analysis.
Method: *EPA 3005A/6010A/7470A Nov 1990*

Client Sample ID: **MWT-2**
Spl#: 227390 *Matrix:* WATER *Extracted:* February 9, 1999
Sampled: February 3, 1999 *Run#:* 17314 *Analyzed:* February 9, 1999

ANALYTE	RESULT (mg/L)	REPORTING LIMIT (mg/L)	BLANK RESULT (mg/L)	BLANK SPIKE (%)	DILUTION FACTOR
LEAD	N.D.	0.0050	N.D.	104	1

Shafi Barekzai
Analyst

Michael Verona
Operations Manager

415-485-6062 GC 02/10

1220 Quarry Lane • Pleasanton, California 94566-4756
(925) 484-1919 • Facsimile (925) 484-1096
Federal ID #68-0140157

CHROMALAB, INC.

Environmental Services (SDB)

February 10, 1999 *Submission #:* 9902047

W.E.S.T, WORLD ENVIRONMENTAL

Atten: Peter Krasnoff

Project: MONARCH
Received: February 3, 1999

re: One sample for Soluble Miscellaneous Metals with Mercury analysis.
Method: *EPA 3005A/6010A/7470A Nov 1990*

Client Sample ID: **MWT-3**
Spl#: 227391 *Matrix:* WATER *Extracted:* February 9, 1999
Sampled: February 3, 1999 *Run#:* 17314 *Analyzed:* February 9, 1999

ANALYTE	RESULT (mg/L)	REPORTING LIMIT (mg/L)	BLANK RESULT (mg/L)	BLANK SPIKE (%)	DILUTION FACTOR
LEAD	N.D.	0.0050	N.D.	104	1

Shafi Barekzai
Analyst

Michael Verona
Operations Manager

1220 Quarry Lane • Pleasanton, California 94566-4756
(925) 484-1919 • Facsimile (925) 484-1096
Federal ID #68-0140157

CHROMALAB, INC.

Environmental Services (SDB)

February 9, 1999 *Submission #:* 9902047

W.E.S.T, WORLD ENVIRONMENTAL

Atten: Peter Krasnoff

Project: MONARCH
Received: February 3, 1999

re: 3 samples for TPH - Diesel analysis.
Method: *EPA 8015M*

Matrix: WATER *Extracted:* February 3, 1999
Sampled: February 3, 1999 *Run#:* 17243 *Analyzed:* February 5, 1999

Spl# CLIENT SPL ID	DIESEL (ug/L)	REPORTING LIMIT (ug/L)	BLANK RESULT (ug/L)	BLANK SPIKE (%)	DILUTION FACTOR
227389 MWT-1	960	50	N.D.	90.0	1
Note: Hydrocarbon reported is in the early Diesel Range and does not match our Diesel Standard.					
227390 MWT-2	110	50	N.D.	90.0	1
Note: Hydrocarbon reported does not match the pattern of our Diesel Standard.					
227391 MWT-3	94	50	N.D.	90.0	1
Note: Hydrocarbon reported does not match the pattern of our Diesel Standard.					

Carolyn House
Analyst

Bruce Havlik
Analyst

1220 Quarry Lane • Pleasanton, California 94566-4756
(925) 484-1919 • Facsimile (925) 484-1096
Federal ID #68-0140157

4702047 Tech-xet

CHROMALAB, INC.

Environmental Services (SDB) (DOHS 1094)

1220 Quarry Lane • Pleasanton, California 94566-4756
510/484-1919 • Facsimile 510/484-1096

FEB - - 2000

File

Reference #: 44418

Chain of Custody

DATE 2-3-99 PAGE 1 OF

PROJ MGR P. Krasnoff
COMPANY WEST
ADDRESS 828
San Rafael
SAMPLERS (SIGNATURE) (PHONE NO.)
(FAX NO.)

ANALYSIS REPORT

SAMPLE ID.	DATE	TIME	MATRIX	PRESERV.	TPH-(EPA 8015,8020) Gas w/ BTEX MTBE	PURGEABLE AROMATICS BTEX (EPA 8020)	TPH-Diesel (EPA 8015M)	TEPH (EPA 8015M) Diesel M.O. Other	PURGEABLE HALOCARBONS (HVOCs) (EPA 8010)	VOLATILE ORGANICS (VOCs) (EPA 8260)	SEMIVOLATILES (EPA 8270)	TOTAL OIL AND GREASE (SM 5520 B+F, E+F)	1,2 DCA (8010)	PESTICIDES(EPA 8080) PCB'S (EPA 8080)	PNA's by 8270 8310	Spec. Cond. TSS TDS	LUFT METALS: Cd, Cr, Pb, Ni, Zn	CAM 17 METALS (EPA 6010/7470/7471)	TOTAL LEAD	W.E.T. (STLC) TCLP	Hexavalent Chromium pH (24 hr hold time for H20)				NUMBER OF CONTAINERS
MWT-1	2-3-99	1530	W		X		X						X						X						8
MWT-2	2-3-99	1440	W		X		X						X						X						8
MWT-3	2-3-99	1530	W		X		X						X						X						8
Trip Blank					X																				2

SUBM #: 9902047 REF: GC
CLIENT: WESTENV
DUE: 02/10/99
REF #:44418

PROJECT INFORMATION

PROJECT NAME Monarch
PROJECT NUMBER
P.O. #

SAMPLE RECEIPT

TOTAL NO OF CONTAINERS
HEAD SPACE
TEMPERATURE
CONFORMS TO RECORD

TAT: STANDARD 5 DAY | | | 24 | 48 | 72 | OTHER

SPECIAL INSTRUCTIONS/COMMENTS:
Report: ☐ Routine ☐ Level 2 ☐ Level 3 ☐ Level 4 ☐ Electronic Report
- Filter Samples prior to Lead analysis.

4°C on ice
3 tubes
3 poly
18 VOAs
2 TO

RELINQUISHED BY 1	RELINQUISHED BY 2.	RELINQUISHED BY 3
(SIGNATURE) 1620 (TIME)	(SIGNATURE) (TIME)	(SIGNATURE) (TIME)
J Gray 2/3/99 (PRINTED NAME) (DATE)	(PRINTED NAME) (DATE)	(PRINTED NAME) (DATE)
PSC (COMPANY)	(COMPANY)	(COMPANY)
RECEIVED BY 1	**RECEIVED BY 2.**	**RECEIVED BY (LABORATORY) 3**
(SIGNATURE) 1620 (TIME)	(SIGNATURE) (TIME)	(SIGNATURE) (TIME)
A. Paredes 2/3/99 (PRINTED NAME) (DATE)	(PRINTED NAME) (DATE)	(PRINTED NAME) (DATE)
Chromalab (COMPANY)	(COMPANY)	(LAB)

CHROMALAB, INC.
Environmental Services (SDB)

Submission #: 1999-08-0466
Date: September 3, 1999

West World Environmental
828 Mission Steet, 2nd Floor
San Rafael, CA 94901

Attn.: Steve Michelson

Project: Monarch

Attached is our report for your samples received on Friday August 27, 1999.
This report has been reviewed and approved for release. Reproduction of this report is permitted only in its entirety.

Please note that any unused portion of the samples will be discarded after September 26, 1999 unless you have requested otherwise. We appreciate the opportunity to be of service to you. If you have any questions, please call me at (925) 484-1919.

Sincerely,

Gary Cook

Diesel

West World Environmental

828 Mission Steet, 2nd Floor
San Rafael, CA 94901

Attn: Steve Michelson

Phone: (415) 460-6770 Fax: (415) 485-6062

Project #:

Project: Monarch

Samples Reported

Sample ID	Matrix	Date Sampled	Lab #
MWT-3	Water	08/27/1999 13:40	1
MWT-2	Water	08/27/1999 14:35	2
MWT-1	Water	08/27/1999 15:45	3

CHROMALAB, INC.

Environmental Services (SDB)

Submission #: 1999-08-0466

To: **West World Environmental**
Attn.: Steve Michelson

Test Method: 8015m
Prep Method: 3510/8015M

Diesel

Sample ID: **MWT-3**
Project: Monarch
Sampled: 08/27/1999 13:40
Matrix: Water

Lab Sample ID: **1999-08-0466-001**
Received: 08/27/1999 16:35
Extracted: 09/01/1999 09:00
QC-Batch: 1999/09/01-03.10

Compound	Result	Rep.Limit	Units	Dilution	Analyzed	Flag
Diesel	ND	50	ug/L	1.00	09/02/1999 00:31	
Surrogate(s)						
o-Terphenyl	88.1	60-130	%	1.00	09/02/1999 00:31	

CHROMALAB, INC.

Environmental Services (SDB)

Submission #: 1999-08-0466

To: **West World Environmental**
Attn.: Steve Michelson

Test Method: 8015m
Prep Method: 3510/8015M

Diesel

Sample ID:	**MWT-2**	Lab Sample ID:	**1999-08-0466-002**
Project:	Monarch	Received:	08/27/1999 16:35
		Extracted:	09/01/1999 09:00
Sampled:	08/27/1999 14:35	QC-Batch:	1999/09/01-03.10
Matrix:	Water		

Compound	Result	Rep.Limit	Units	Dilution	Analyzed	Flag
Diesel	280	50	ug/L	1.00	09/02/1999 01:14	ed
Surrogate(s)						
o-Terphenyl	86.7	60-130	%	1.00	09/02/1999 01:14	

CHROMALAB, INC.

Environmental Services (SDB)

Submission #: 1999-08-0466

To: **West World Environmental**
Attn.: Steve Michelson

Test Method: 8015m
Prep Method: 3510/8015M

Diesel

Sample ID:	**MWT-1**	Lab Sample ID:	**1999-08-0466-003**
Project:	Monarch	Received:	08/27/1999 16:35
		Extracted:	09/01/1999 09:00
Sampled:	08/27/1999 15:45	QC-Batch:	1999/09/01-03.10
Matrix:	Water		

Compound	Result	Rep.Limit	Units	Dilution	Analyzed	Flag
Diesel	ND	50	ug/L	1.00	09/02/1999 01:57	
Surrogate(s)						
o-Terphenyl	90.4	60-130	%	1.00	09/02/1999 01:57	

To: **West World Environmental**
Attn.: Steve Michelson

Test Method: 8015m
Prep Method: 3510/8015M

Batch QC Report
Diesel

Method Blank **Water** **QC Batch # 1999/09/01-03.10**

MB: 1999/09/01-03.10-001 Date Extracted: 09/01/1999 09:00

Compound	Result	Rep.Limit	Units	Analyzed	Flag
Diesel	ND	50	ug/L	09/01/1999 23:48	
Surrogate(s)					
o-Terphenyl	84.5	60-130	%	09/01/1999 23:48	

CHROMALAB, INC.

Environmental Services (SDB)

Submission #: 1999-08-0466

To: **West World Environmental**
Attn: Steve Michelson

Test Method: 8015m
Prep Method: 3510/8015M

Batch QC Report

Diesel

Laboratory Control Spike (LCS/LCSD) **Water** **QC Batch # 1999/09/01-03.10**

LCS: 1999/09/01-03.10-002 Extracted: 09/01/1999 09:00 Analyzed: 09/02/1999 11:42
LCSD: 1999/09/01-03.10-003 Extracted: 09/02/1999 09:00 Analyzed: 09/02/1999 12:14

Compound	Conc. [ug/L]		Exp.Conc. [ug/L]		Recovery [%]		RPD	Ctrl. Limits [%]		Flags	
	LCS	LCSD	LCS	LCSD	LCS	LCSD	[%]	Recovery	RPD	LCS	LCSD
Diesel	1000	1110	1250	1250	80.0	88.8	10.4	60-130	25		
Surrogate(s)											
o-Terphenyl	22.4	22.9	20.0	20.0	112.0	114.5		60-130			

To: **West World Environmental**
Attn:Steve Michelson

Test Method: 8015m
Prep Method: 3510/8015M

Legend & Notes

Diesel

Analyte Flags

ed

Hydrocarbon reported is in the early Diesel range, and does not match our Diesel standard

CHROMALAB, INC.

Environmental Services (SDB)

Submission #: 1999-08-0466

Gas/BTEX

West World Environmental	✉ 828 Mission Steet, 2nd Floor San Rafael, CA 94901
Attn: Steve Michelson	Phone: (415) 460-6770 Fax: (415) 485-6062
Project #:	Project: Monarch

Samples Reported

Sample ID	Matrix	Date Sampled	Lab #
MWT-3	Water	08/27/1999 13:40	1
MWT-2	Water	08/27/1999 14:35	2
MWT-1	Water	08/27/1999 15:45	3

CHROMALAB, INC.

Environmental Services (SDB)

Submission #: 1999-08-0466

To: **West World Environmental**

Attn.: Steve Michelson

Test Method: 8015M
8020

Prep Method: 5030

Gas/BTEX

Sample ID:	**MWT-3**	Lab Sample ID:	**1999-08-0466-001**
Project:	Monarch	Received:	08/27/1999 16:35
		Extracted:	08/31/1999 20:21
Sampled:	08/27/1999 13:40	QC-Batch:	1999/08/31-01.01
Matrix:	Water		

Compound	Result	Rep.Limit	Units	Dilution	Analyzed	Flag
Gasoline	ND	50	ug/L	1.00	08/31/1999 20:21	
Benzene	ND	0.50	ug/L	1.00	08/31/1999 20:21	
Toluene	ND	0.50	ug/L	1.00	08/31/1999 20:21	
Ethyl benzene	ND	0.50	ug/L	1.00	08/31/1999 20:21	
Xylene(s)	ND	0.50	ug/L	1.00	08/31/1999 20:21	
Surrogate(s)						
Trifluorotoluene	95.6	58-124	%	1.00	08/31/1999 20:21	
4-Bromofluorobenzene-FID	82.8	50-150	%	1.00	08/31/1999 20:21	

CHROMALAB, INC.

Environmental Services (SDB)

Submission #: 1999-08-0466

To: **West World Environmental**

Attn.: Steve Michelson

Test Method: 8015M
8020

Prep Method: 5030

Gas/BTEX

Sample ID:	**MWT-2**	Lab Sample ID:	**1999-08-0466-002**
Project:	Monarch	Received:	08/27/1999 16:35
		Extracted:	08/31/1999 20:48
Sampled:	08/27/1999 14:35	QC-Batch:	1999/08/31-01.01
Matrix:	Water		

Compound	Result	Rep.Limit	Units	Dilution	Analyzed	Flag
Gasoline	5000	500	ug/L	10.00	08/31/1999 20:48	g
Benzene	110	5.0	ug/L	10.00	08/31/1999 20:48	
Toluene	ND	5.0	ug/L	10.00	08/31/1999 20:48	
Ethyl benzene	450	5.0	ug/L	10.00	08/31/1999 20:48	
Xylene(s)	400	5.0	ug/L	10.00	08/31/1999 20:48	
Surrogate(s)						
Trifluorotoluene	102.7	58-124	%	1.00	08/31/1999 20:48	
4-Bromofluorobenzene-FID	95.4	50-150	%	1.00	08/31/1999 20:48	

CHROMALAB, INC.

Environmental Services (SDB)

Submission #: 1999-08-0466

To: **West World Environmental**

Attn.: Steve Michelson

Test Method: 8015M
8020

Prep Method: 5030

Gas/BTEX

Sample ID:	**MWT-1**	Lab Sample ID:	**1999-08-0466-003**
Project:	Monarch	Received:	08/27/1999 16:35
		Extracted:	08/31/1999 20:21
Sampled:	08/27/1999 15:45	QC-Batch:	1999/08/31-01.01
Matrix:	Water		

Compound	Result	Rep.Limit	Units	Dilution	Analyzed	Flag
Gasoline	ND	50	ug/L	1.00	08/31/1999 20:21	
Benzene	ND	0.50	ug/L	1.00	08/31/1999 20:21	
Toluene	ND	0.50	ug/L	1.00	08/31/1999 20:21	
Ethyl benzene	ND	0.50	ug/L	1.00	08/31/1999 20:21	
Xylene(s)	ND	0.50	ug/L	1.00	08/31/1999 20:21	
Surrogate(s)						
Trifluorotoluene	91.9	58-124	%	1.00	08/31/1999 20:21	
4-Bromofluorobenzene-FID	81.7	50-150	%	1.00	08/31/1999 20:21	

To: **West World Environmental**

Attn.: Steve Michelson

Test Method: 8020
8015M

Prep Method: 5030

Batch QC Report

Gas/BTEX

Method Blank | **Water** | **QC Batch # 1999/08/31-01.01**

MB: 1999/08/31-01.01-001

Date Extracted: 08/31/1999 06:20

Compound	Result	Rep.Limit	Units	Analyzed	Flag
Gasoline	ND	50	ug/L	08/31/1999 06:20	
Benzene	ND	0.5	ug/L	08/31/1999 06:20	
Toluene	ND	0.5	ug/L	08/31/1999 06:20	
Ethyl benzene	ND	0.5	ug/L	08/31/1999 06:20	
Xylene(s)	ND	0.5	ug/L	08/31/1999 06:20	
Surrogate(s)					
Trifluorotoluene	98.6	58-124	%	08/31/1999 06:20	
4-Bromofluorobenzene-FID	83.2	50-150	%	08/31/1999 06:20	

CHROMALAB, INC.

Environmental Services (SDB)

Submission #: 1999-08-0466

To: **West World Environmental**

Attn: Steve Michelson

Test Method: 8020
8015M

Prep Method: 5030

Batch QC Report

Gas/BTEX

Laboratory Control Spike (LCS/LCSD) **Water** **QC Batch # 1999/08/31-01.01**

LCS: 1999/08/31-01.01-002 Extracted: 08/31/1999 06:47 Analyzed: 08/31/1999 06:47

LCSD: 1999/08/31-01.01-003 Extracted: 08/31/1999 07:40 Analyzed: 08/31/1999 07:40

Compound	Conc. [ug/L]		Exp.Conc. [ug/L]		Recovery [%]		RPD	Ctrl. Limits [%]		Flags	
	LCS	LCSD	LCS	LCSD	LCS	LCSD	[%]	Recovery	RPD	LCS	LCSD
Gasoline	471	561	500	500	94.2	112.2	17.4	75-125	20		
Benzene	103	108	100.0	100.0	103.0	108.0	4.7	77-123	20		
Toluene	105	113	100.0	100.0	105.0	113.0	7.3	78-122	20		
Ethyl benzene	99.1	107	100.0	100.0	99.1	107.0	7.7	70-130	20		
Xylene(s)	292	315	300	300	97.3	105.0	7.6	75-125	20		
Surrogate(s)											
Trifluorotoluene	538	577	500	500	107.6	115.4		58-124			
4-Bromofluorobenzene-FI	470	530	500	500	94.0	106.0		50-150			

To: **West World Environmental**

Attn:Steve Michelson

Test Method: 8015M
8020

Prep Method: 5030

Legend & Notes

Gas/BTEX

Analyte Flags

g

Hydrocarbon reported in the gasoline range does not match our gasoline standard.

CHROMALAB, INC.

Environmental Services (SDB) (DOHS 1094)

99-08-0466

1220 Quarry Lane • Pleasanton, California 94566-4756
(925) 484-1919 • Fax (925) 484-1096

Reference #: 47095

Chain of Custody

DATE 8/27/99 PAGE 1 OF 1

PROJ. MGR Steve Michelsen / Amy Womack
COMPANY WEST
ADDRESS 828 Mission Avenue 2nd Floor
San Rafael, CA 94901
SAMPLERS (SIGNATURE) (415) 460-6770 (PHONE NO.)
(415) 460-6771 (FAX NO.)

ANALYSIS REPORT

SAMPLE ID.	DATE	TIME	MATRIX	PRESERV.	TPH-(EPA 8015,8020) ☒ Gas w/ ☒ BTEX ☐ MTBE	PURGEABLE AROMATICS BTEX (EPA 8020)	TPH-Diesel (EPA 8015M)	TEPH (EPA 8015M) ☐ Diesel ☐ M.O. ☐ Other	PURGEABLE HALOCARBONS (HVOCs) (EPA 8010)	VOLATILE ORGANICS (VOCs) (EPA 8260)	SEMIVOLATILES (EPA 8270)	TOTAL OIL AND GREASE (SM 5520 B+F, E+F)		☐ PESTICIDES (EPA 8080) ☐ PCB'S (EPA 8080)	PNA's by ☐ 8270 ☐ 8310	☐ Spec. Cond. ☐ TSS ☐ TDS	LUFT METALS: Cd, Cr, Pb, Ni, Zn	CAM 17 METALS (EPA 6010/7470/7471)	TOTAL LEAD	☐ W.E.T. (STLC) ☐ TCLP	☐ Hexavalent Chromium ☐ pH (24 hr hold time for H20)				NUMBER OF CONTAINERS
MWT-3	8/27/99	13:40	Water	HCl	3		1																		4
MWT-2	8/27/99	14:35	Water	HCl	3		1																		4
MWT-1	8/27/99	15:45	Water	HCl	3		1																		4

PROJECT INFORMATION

PROJECT NAME: Monarch
PROJECT NUMBER
P.O. #

SAMPLE RECEIPT

TOTAL NO. OF CONTAINERS
HEAD SPACE
TEMPERATURE
CONFORMS TO RECORD

TAT: STANDARD 5-DAY | | 24 | 48 | 72 | OTHER

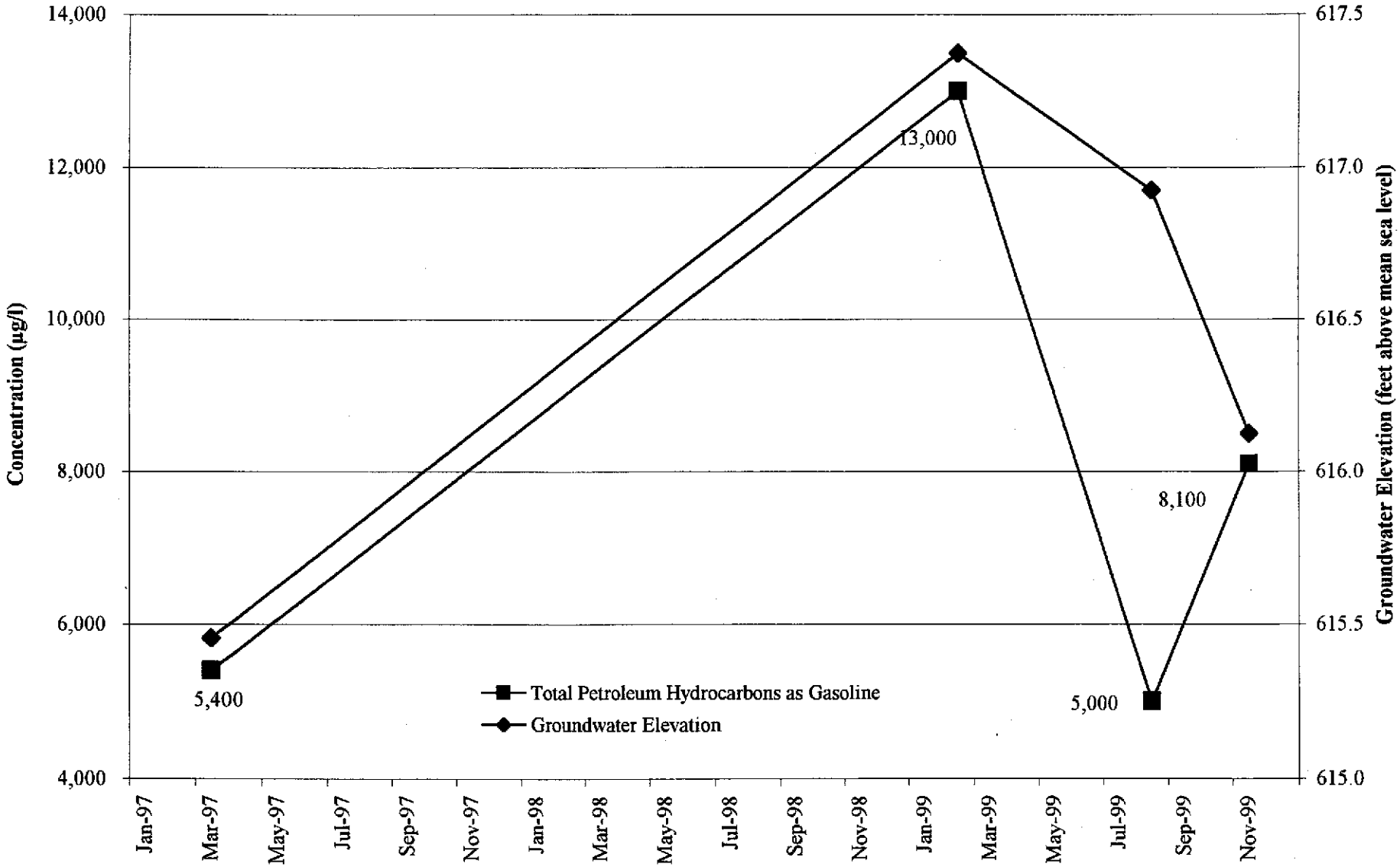
SPECIAL INSTRUCTIONS/COMMENTS:
Report: ☒ Routine ☐ Level 2 ☐ Level 3 ☐ Level 4 ☐ Electronic Report

RELINQUISHED BY 1.	RELINQUISHED BY 2.	RELINQUISHED BY 3.
(SIGNATURE) (TIME) 16:35	(SIGNATURE) (TIME)	(SIGNATURE) (TIME)
Stephen Penman 8/27/99 (PRINTED NAME) (DATE)	(PRINTED NAME) (DATE)	(PRINTED NAME) (DATE)
Environmental Sampling Svcs (COMPANY)	(COMPANY)	(COMPANY)
RECEIVED BY 1	**RECEIVED BY 2.**	**RECEIVED BY (LABORATORY) 3**
(SIGNATURE) (TIME)	(SIGNATURE) (TIME)	Denise Harrington (SIGNATURE) (TIME)
(PRINTED NAME) (DATE)	(PRINTED NAME) (DATE)	D. Harrington 1635 (PRINTED NAME) (DATE)
(COMPANY)	(COMPANY)	Chromalab 8/27/99 (LAB)

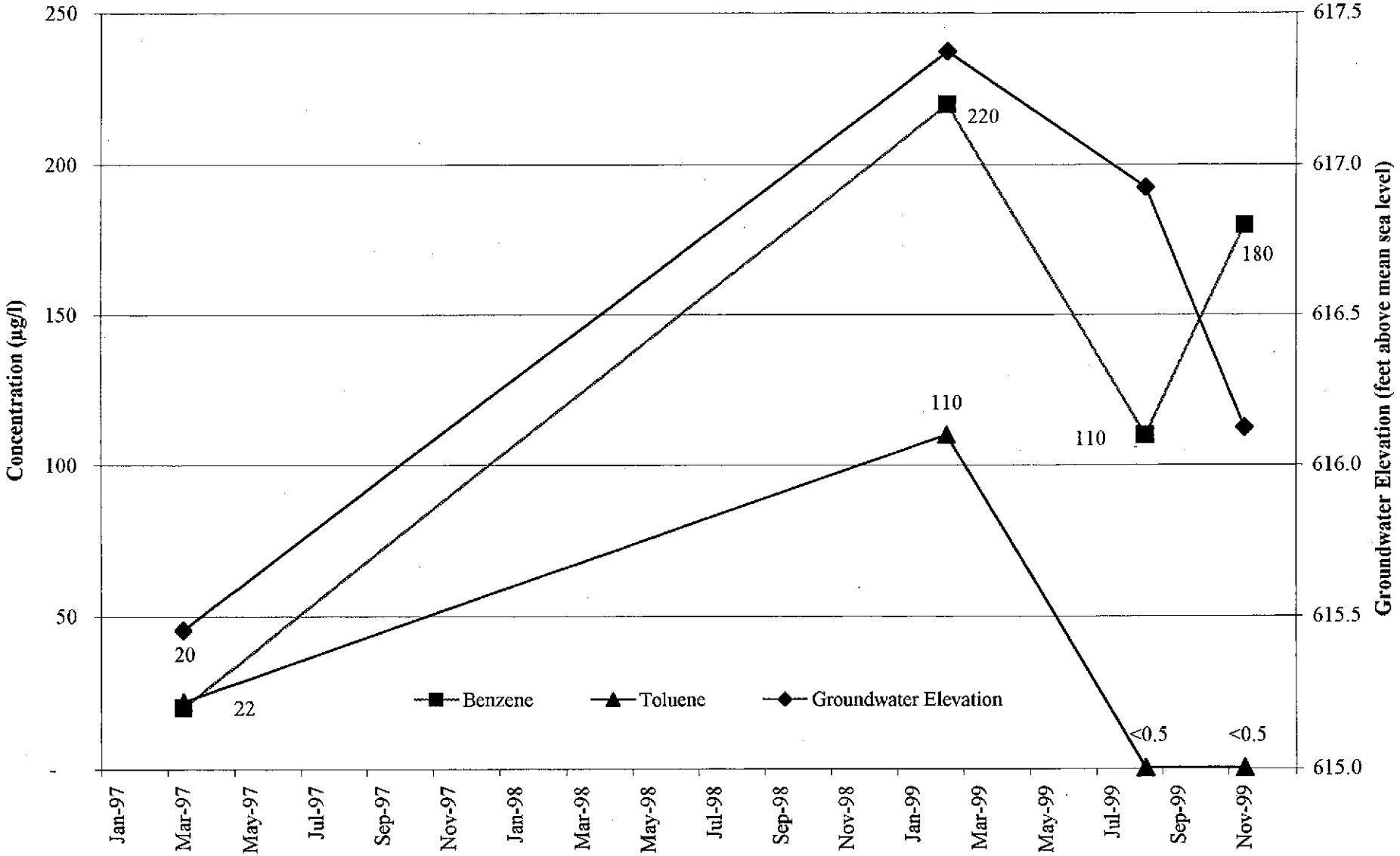
APPENDIX C

GRAPH OF CHEMICAL CONCENTRATIONS VERSUS GROUNDWATER ELEVATIONS

Graph 1
Monitoring Well MWT-2
Total Petroleum Hydrocarbons as Gasoline versus Groundwater Elevation
Former Monarch Airport, Livermore, CA



Graph 2
Monitoring Well MWT-2
Benzene and Toluene versus Groundwater Elevation
Former Monarch Airport, Livermore, CA



Graph 3
Monitoring Well MWT-2
Ethly benzene and Xylenes versus Groundwater Elevation
Former Monarch Airport, Livermore, CA