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June 30, 2009

Steven Plunkett
Alameda Country Health Care Services ("County")
1131 Harbor Bay Parkway, Suite 250
Alameda County, CA 94502-6577

LUFT Site: 900 Central Ave, Alameda (Site)
Re: Report Submittal – *Corrective Action Plan*, June 30, 2009.

Dear Mr. Plunkett:

On behalf of the parties contributing to the 900 Central Avenue Corrective Action Account, please find enclosed herewith a copy of the above-referenced Corrective Action Plan (CAP) prepared by RRM, Inc., Santa Cruz, CA (RRM).

On behalf of the parties participating in site-remediation efforts, I declare under penalty of perjury that the information contained in the enclosed document is true and correct to the best of my knowledge.

RRM prepared the CAP pursuant to directives set forth in County correspondence dated December 8, 2008. In the CAP RRM summarizes available information on contaminant distribution in soil and groundwater, identifies and evaluates potential health risks and risk-exposure pathways, establishes appropriate risk-based cleanup goals to mitigate the identified risks, and identifies and evaluates four remedial options for meeting the cleanup goals.

According to RRM, there is a 10-feet thick, by 30-feet wide by 60-feet long zone of heavily impacted saturated soils (670 bank cubic yards) between 7 to 17 feet from grade extending southwest from the former tank area through the area of well MW-1. RRM has concluded the TPHg and benzene levels in saturated soils and groundwater within the central portion of this impacted zone, are high enough to represent a secondary source area and present a vapor-intrusion risk.

RRM has concluded that remedial excavation is the optimal remedial approach for meeting site-cleanup goals. Specifically, they are recommending excavating and off-hauling the most heavily impacted saturated soils in the central portion of the impacted area described above and then purging the pit of contaminated groundwater. They considered and rejected sparging-enhanced dual-phase extraction and in-situ chemical oxidation on the basis of various evaluation criteria including the likelihood of agency and community acceptance, short and long term effectiveness in reducing contaminant levels, technical merits, and economics.

The targeted work area is 30-feet long by 25-feet wide by 18-feet deep and involves 500 bank cubic yards of soil that will be excavated and replaced with clean fill. The upper 7 feet of unsaturated soil (190 yards) is assumed to be free of contamination and will be off-hauled to a Class III landfill since there is nowhere to store it within the site boundaries. The 10-foot-thick interval of heavily-impacted saturated soils from 8 to 18 feet from grade (280 bank cubic yards) will be off-hauled to a Class II landfill. Depending on the groundwater recharge rate, the highly contaminated standing water that enters the pit will either be off-hauled for disposal via vacuum tank trucks or extracted and treated on site under a short-term public works permit with discharge to a sanitary sewer cleanout.

The CAP calls removing and replacing affected areas of street and sidewalk on the corner of Central and Ninth including the underlying storm-water collection system. It also calls for installing interlocking sheet shoring, confirmation sampling, traffic control, and appropriate safety and security

measures. The project will require City grading and encroachment permits as well as County approval. It will also require CAL-Trans approval and pre-profiling the soils for disposal to allow for direct loading for Class II and III landfill disposal.

The work is optimally conducted in dry weather and during low-water-table conditions. The project is tentatively scheduled for the late third or early fourth quarter 2009 contingent upon securing all necessary permits and approvals.

We are in the process of making all the associated Geotracker and FTP uploads that are due in connection with this report.

Thank you for your ongoing courtesy and cooperation.

Sincerely:

Brian T. Kelleher

Court consultant/project coordinator

Cc with enclosure: Kim Dincel, Esq., Hines, Smith et al, counsel for Pearce Parties; Gail Ward, Senior Claims Specialist, Safeco, for Thompson Parties; Joe Ryan, Esq., Ryan & Lifter, counsel for Thompson Parties; Laurie Sherwood, Esq., Walsworth & Franklin et al counsel for Peterson Parties; Edward Martins, Esq., counsel for Ann Marie Holland and Estate of John Holland Sr.; Hal Reiland, counsel for Barbara Holland; Jack Holland Jr., c/o Mulholland Bros; cc cover letter only, Matt Kaempf, RRM

CORRECTIVE ACTION PLAN

Holland Oil/Pearce Property
900 Central Avenue
Alameda, CA

Prepared for:
900 Central Avenue Corrective Action Account
c/o Mr. Brian Kelleher
Kelleher & Associates
5655 Silver Creek Valley Road, PMB 281
San Jose, CA 95138

Prepared by:
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2560 Soquel Avenue, Suite 202
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June 30, 2009

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1.0 INTRODUCTION

This report presents a Corrective Action Plan (CAP) for the leaking underground storage tank (UST) case located at 900 Central Avenue, Alameda, CA (Figure 1). As such, this document is intended to comply with requirements set forth in California Code of Regulations Article 11, Chapter 16, Title 23.

In a letter dated December 8, 2008, the Alameda County Environmental Health Services (ACEHS) requested preparation of this CAP to select an appropriate and cost-effective technology for remediation of impacted soil and groundwater at the site. Discussions of the site background, corrective action goals, corrective action alternatives, and the recommended alternative are presented in subsequent sections of this report. This document addresses County recommendations in the December 8, 2008 letter to conduct soil gas sampling and conduct additional investigations for vertical delineation of the contaminated interval in advance of CAP preparation.

2.0 SITE BACKGROUND

2.1 Physical Site Conditions

Location. The site is located on the southeast corner of Central Avenue and Ninth Street in Alameda, CA. In September 1975 the site operated as a Holland Oil Company retail gasoline station that consisted of a garage at the southwest corner, a pump island canopy in the northeast quadrant, three 550-gallon underground storage tanks (USTs) located beneath the sidewalk along Ninth Street, and reportedly, a waste oil tank. According to Alameda Fire Department records, the original permit for the tanks was issued in 1931 to Mohawk Oil Company. A 1973 business directory lists the operator as EZ Pickings Gas and a 1975 directory as Holland Service Station No. 1. The tanks were removed by Holland Oil Company Inc., in September 1975.

In 1976 the property was sold to the Peterson family. In 1978, the Petersons sold the property to Gary Thompson dba Oak Construction. In October 1978 Oak Construction razed the gas station structures and constructed a residential duplex. The current owners, Karen and Gary Pearce, purchased the property in May 1985. The identification of subsurface contamination in 1994 instigated a lawsuit between the past and present owners. Due to the complexity of the lawsuit, William Nagle was appointed as Special Master in 1996 to help resolve the case. In 2003, Brian Kelleher of Kelleher & Associates in San Jose, CA was appointed on behalf of the litigating parties to coordinate remedial response actions and associated cost recovery work.

The property is located in a mixed residential/commercial area. To the west, at the southwest corner of Central Avenue and Ninth Street, was a former church that has since been converted to a movie theater. The property to the northwest (841 Central Avenue) is reportedly the location of a former gas station that operated from approximately 1947 to 1969. Both former gas station properties and the remainder of the surrounding properties are currently residential (Figure 2).

Local Surface Water. The nearest surface water is a man-made lagoon system approximately 1,000 feet south of the site; the San Francisco Bay is approximately 2,000 feet southwest, and the Brooklyn Basin is located approximately 1 mile northeast (Figure 1).

Local Geology. The site is on gently sloping terrain approximately 25 feet above mean sea level. Based on interpretation of historical boring logs, the site is underlain by sandy fill to a depth of approximately 3.5 feet. Fine sandy silt and poorly graded sand was encountered beneath the fill to approximately 26 feet below ground surface (bgs), the maximum depth explored. (Lowney*, Soil and Groundwater Quality Reconnaissance,* July 20, 1994*;* and Allwest*, Subsurface Investigation Report,* August 5, 1997, and quarterly monitoring reports for 1999 and 2002). Boring logs are presented in Appendix A, and a cross section is shown on Figures 2 and 3.

Local Groundwater. First encountered groundwater has been measured between approximately 10 and 14 feet bgs in soil borings advanced at the site; however, from the over four years of quarterly groundwater monitoring, depth to water has ranged from approximately 6 to 13 feet bgs, and appears to be seasonally influenced. Groundwater has generally been determined to flow to the southwest toward the San Francisco Bay. A groundwater elevation contour map prepared from data collected February 9, 2009 is shown on Figure 4 and groundwater monitoring well construction and groundwater elevation data are summarized in Tables 1 and 2, respectively.

Utility Survey. In February 2009, RRM conducted a utility survey for the site and vicinity. East Bay Municipal Utility District supplies water to the site, Pacific Gas & Electric (PG&E) supplies natural gas and electricity (electric lines are overhead), and the City of Alameda provides sanitary and storm sewer utilities. Given that the depth to groundwater at the site has been measured at depths as shallow as approximately 6 feet bgs, and the dissolved petroleum hydrocarbon plume appears to extend into Central Avenue; the utilities could serve as preferential pathways for migration. The approximate locations of identified utilities are shown on Figure 2.

Well Survey. In December 2002, Allwest Environmental, Inc. (Allwest) of San Francisco, CA reviewed data from the California Department of Water Resources, Alameda County Public Works, and the State Water Resources Control Board Geotracker database to locate drinking water wells located within 1,000 feet of the site. Five wells were identified within 1,000 feet of the site, but none were identified as drinking water wells. The three closest wells (ID#'s 18, 19, and 20) are located approximately 581 feet southwest, 264 feet west, and 264 feet north of the site, respectively; the use of Well #18 is unknown and the well could not be located in the field, Well #19 is listed as an irrigation well, and Well #20 is listed as a monitoring well. The remaining two wells (ID#'s 11 and17) are located upgradient of the site approximately 950 feet southeast and 792 feet east, respectively; both are listed as irrigation wells. Since the dissolved plume does not extend beyond approximately 60 feet downgradient of the site, it is unlikely that any of the identified wells would be affected. The well survey information is included in Appendix B. (Allwest: *2002 Annual Groundwater Monitoring & Risk Assessment Report,* January 31, 2003).

2.2 Investigations

The locations of wells, and borings are shown on Figure 2, groundwater analytical data are summarized in Table 2 and shown on Figures 5 and 6, and soil analytical data is summarized in Table 3 and Figures 3 and 7.

April 1994 Subsurface Investigations. Lowney Associates (Lowney) of Mountain View, CA conducted a site history review that included historic Sanborn maps and aerial photos and completed a subsurface investigation. During the investigation, three bore holes (EB-1 through EB-3) were completed to approximately 20 feet bgs in the area of the incorrectly presumed location of the former USTs and pump island. Soil samples were collected at 5-foot intervals and grab groundwater samples were collected from each boring; all groundwater and select soil samples (15 to 16-foot interval) were analyzed for motor oil range total petroleum hydrocarbons (TPHmo), diesel range TPH (TPHd), gasoline range TPH (TPHg), benzene, toluene, ethyl benzene, and xylenes (collectively BTEX); and a leachability test was conducted on the soil sample collected from Boring EB-1. Petroleum hydrocarbons were only detected in soil at Boring EB-1; TPHg and benzene were detected at 95 parts per million (ppm) and 0.4 ppm respectively. Petroleum hydrocarbons were detected in all the grab groundwater samples; the highest TPHg and benzene concentrations were detected in Boring EB-1 at 76,000 parts per billion (ppb) and 2,200 ppb respectively. The leachability testing resulted in TPHg and benzene concentrations of 4,300 ppb and 9 ppb, respectively. (Lowney Associates*: Soil and Groundwater Quality Reconnaissance,* July 20, 1994)

June 1997 Subsurface Investigations and RBCA Analyses. Allwest conducted a file review to assess potential on- and off-site sources of subsurface contamination. Eight direct push soil borings (P-1 through P-8) were also advanced to approximately 16 feet bgs in the area of the presumed location of the former USTs and pump island. Soil samples were collected at 5-foot intervals and field-tested for total volatile hydrocarbons with an organic vapor analyzer (OVA). Grab groundwater samples from each boring and 11 soil samples were analyzed for TPHg and BTEX. Discolored/odorous soils were reported at 10 to 12 feet bgs in borings P-2 through P-4. Petroleum hydrocarbons were detected in soil from borings P-3 and P-4; and the highest concentrations of 4,600 ppm TPHg and 15 ppm benzene were detected in the soil sample collected at 14.5 feet bgs from Boring P-3. Petroleum hydrocarbons were detected in groundwater at borings P-2 through P-4, P-7, and P-8; the highest concentration of 92,000 ppb was detected at Boring P-3 and the highest concentration of 610 ppb benzene was detected in Boring P-4. Tier 1 and Tier 2 risk-based corrective-action evaluations were conducted using ASTM methodology, and based on the results; Allwest concluded there were no significant human health risks and no need for active remediation. (Allwest: *Subsurface Investigation Report,* August 5, 1997)

November 1998 Well Installations and Sampling. Allwest advanced three borings to 18 feet bgs at the northeast quadrant of the site; soil samples were collected at 5-foot intervals and field tested for TVH using an OVA. The borings were converted to 2-inch diameter monitoring wells (MW-1 through MW-3). Groundwater samples collected from each of the wells were analyzed for TPHg, BTEX, and methyl tertiary butanol (MtBE). TPHg and benzene were only detected in the sample from MW-1 at 360 ppb and 5.8 ppb, respectively. Allwest's recommendation to monitor the wells quarterly for one year was approved by ACEHS (Allwest: *Groundwater Monitoring Well Installation and Sampling,* February 2, 1999)

2002- Conceptual Model and Risk Assessment. In December 2002, Allwest prepared a site conceptual model consisting of a 3-dimensional drawing showing known areas of subsurface contamination and potential sensitive receptors. Also a cursory risk assessment using risk-based screening levels (RBSLs) in recently published Regional Water Quality Control Board (RWQCB) lookup tables was conducted.

Based on the risk assessment, Allwest concluded that the RBSLs for groundwater were exceeded at MW-1 for the vapor migration to indoor-air-inhalation pathway, and pose a possible risk to off site receptors. (Allwest*: 2002 Annual Groundwater Monitoring & Risk Assessment Report,* January 31, 2003)

June and August 2007 Well Installations. On June 20, 2007, RRM installed three 2-inch diameter groundwater monitoring wells (MW-4 through MW-6) to a depth of approximately 18 feet bgs, and on August 13, 2007 installed one 4-inch diameter recovery well (RW-1) to approximately 20 feet bgs. Soil samples were collected at approximate 5-foot intervals and field tested for TVH using an OVA; select soil samples were submitted for laboratory analyses of TPHg and BTEX. No compounds were detected in any of the soil samples analyzed. The wells were added to the quarterly groundwater monitoring program. (RRM: *Subsurface Investigation Results, Second and Third Quarter 2007 Groundwater Monitoring Result,* October 23, 2007)

August 2007 Direct Push Soil Borings. On August 9, 2007, RRM advanced six exploratory soil borings (SB-1 through SB-6) using direct-push drilling technology to depths ranging from 8 to 26 feet bgs. The soil borings were continuously sampled for logging purposes and to collect representative samples for laboratory analyses. Groundwater samples were not collected. Groundwater was encountered in borings SB-1 through SB-3 and SB-6 at depths ranging from 12.5 feet to 14.5 feet bgs. Petroleum hydrocarbons were detected in soil samples collected from Boring SB-1 at depths ranging from 7.5 feet to 16 feet bgs and from Boring SB-4 at 8 feet bgs. TPHg was detected in Boring SB-1 at concentrations ranging from 0.79 ppm at 7.5 feet bgs to 2,600 ppm at 12 feet bgs and in Boring SB-4 at a concentration of 5.1 ppm at 8 feet bgs. Fuel oxygenates including MtBE, other volatile organic compounds (VOCs), and other petroleum hydrocarbons were not detected in any of the soil samples submitted for laboratory analyses (RRM: *Subsurface Investigation Results, Second and Third Quarter 2007 Groundwater Monitoring Result,* October 23, 2007).

Quarterly Groundwater Monitoring. Quarterly groundwater monitoring was conducted at the site during 1998, 1999, 2002, and has been conducted consistently since 2007. The current monitoring well network consists of wells MW-1 through MW-6 and RW-1. Groundwater samples are analyzed for TPHg and BTEX. Historical analyses have included TPHmo, TPHd, MtBE, 1,2-dibromoethane (EDB) and 1,2-dichloroethane (EDC); however, these compounds have been removed from the monitoring program since they were either not detected, or were not significant constituents of concern. A groundwater elevation contour map is shown on Figure 4 and TPHg and benzene is-concentration maps from the February 9, 2009 monitoring event are presented as Figures 5 and 6, respectively.

2.3 Remediation

UST Removal. As previously mentioned, the three 550-gallon USTs and reported waste oil tank were removed by Holland Oil Company Inc. in September 1975, and the gas station structures were removed in October 1978. No other information associated with the UST removal was available to RRM as of the date of this report.

2.4 Composition, Distribution and Magnitude of Soil and Groundwater Contamination

Constituents Detected in Soil and Groundwater. Soil and groundwater samples collected from the site since 1994 have been analyzed for TPHd, TPHmo, TPhss, TPHg, BTEX, MtBE, EDB, EDC, and other VOCs. However, primarily TPHg and BTEX have been detected in soil and groundwater samples collected at the site.

Tables 2 and 3 summarize groundwater and soil analytical results, respectively. Figure 2 shows well and boring locations. Figures 3 and 7 show the distribution of TPHg in soils based on the collective investigation results. Figures 5 and 6 show the current distribution of TPHg and benzene in groundwater from the February 9, 2009 monitoring event.

Source of Petroleum Hydrocarbons. Given the detection of petroleum hydrocarbons in soil in the area of the former USTs, it is probable that the USTs were the primary source (removed in 1975). The residual petroleum hydrocarbons trapped in saturated soils beneath and down-gradient of the former USTs serve as an active secondary source area.

Free Product. Free product has not been noted at the site.

Distribution and Magnitude of Petroleum Hydrocarbons in Soil and Saturated Soil. The analytical data suggests that petroleum hydrocarbons are not present in the vadose zone (unsaturated zone) within or outside the site boundaries; concentrations were generally not reported above laboratory analytical detection limits.

As depicted in Figures 3 and 7, TPHg soil contamination is restricted to the saturated and capillary fringe zones in the northwest corner of the site. Laterally, the impacted area is oriented southwest and covers a footprint roughly 30 feet wide by 60 feet long that extends from the former UST area. Based on groundwater gradient and investigation results, the impacted area is presumed to extend just beyond the north site boundary into Central Avenue and approximately mid-way into Ninth Street. Vertically, the contaminated interval is approximately 10 feet thick and extends from approximately 7 feet to 17 feet from bgs.

Within the contaminated interval, the highest concentrations of petroleum hydrocarbons were generally detected in samples at depths ranging from 12 feet to 14.5 feet bgs from borings drilled within the former UST area and immediately down-gradient of the UST area (borings EB-1, P-3, and SB-1). Residual TPHg concentrations over 100 ppm range from 2,600 ppm at approximately 12 feet bgs in Boring SB-1 to 4,600 ppm at approximately 14.5 feet bgs in Boring P-3. Benzene and MtBE were not detected above the laboratory reporting limits in any of the soil samples analyzed.

The lateral extent of impacted soil is generally delineated to non-detect, or relatively low concentrations to the north by borings SB-4 and SB-5; to the south by borings P-4, SB-6, EB-2, and P-5; to the east by borings SB-2, P-1, and P-2; and to the west by the borings for wells MW-4 through MW-6.

The vertical extent of contamination in the impacted area is defined by boring SB-1 where TPHg was detected at 0.79 ppm at 7.5 feet bgs, 2,600 ppm at 12 feet bgs, 11 ppm at 16 feet bgs and was not detected at 20 feet bgs. This data is adequate for vertical delineation given the central location of boring SB-1 within the contaminated interval, the date of the release (pre MtBE use), the common knowledge that gasoline contamination of the saturated zone is ordinarily restricted to the upper portion of the first

water bearing zone because it is lighter than water, the soil types, and the absence of any indications of contamination (petroleum odors) below 17 feet in the logs of the several borings installed within the contaminated interval.

Assuming an area 30 feet wide by 60 feet long by 10 feet thick, the contaminated interval comprises approximately 670 bank cubic yards of saturated soils.

Distribution and Magnitude of Petroleum Hydrocarbons in Groundwater. As can be expected, the distribution of TPHg in groundwater mimics the distribution in saturated soils described above. Historic groundwater monitoring analytical data indicates elevated concentrations of petroleum hydrocarbons are present in wells MW-1 and RW-1, which are centrally located within the contaminated soil zone. TPHg concentrations in these two wells have been reported as high as 40,000 ppb at Well RW-1 and 100,000 ppb at Well MW-1. Benzene concentrations have been reported as high as 4,000 ppb at Well MW-1. The dissolved petroleum hydrocarbon plume is defined laterally to the south, east and west by wells MW-2 through MW-6. The up-gradient plume boundary is inferred to be just north into Central Avenue.

2.5 Data Gaps

As mentioned above, it is presumed that the impacted saturated zone extends just beyond the north site boundary at the south-most lane of Central Avenue, near the intersection with Ninth Street. The inference of the up-gradient plume boundary is based on groundwater gradients and is considered sufficient for characterization purposes given the difficulty and expense involved with confirmation.

3.0 CORRECTIVE ACTION GOALS

Site-specific numeric corrective action goals are necessary to determine the need for and degree of site remediation, and to evaluate corrective action alternatives. The San Francisco Bay Regional Water Quality Control Board (RWQCB) recently published *Screening for Environmental Concerns at Sites with Contaminated Soil and Water* (Interim Final-November 2007, Revised May 2008) to assist responsible parties and oversight agency personnel in establishing appropriate soil and groundwater cleanup goals for contaminated properties including leaking UST (LUST) sites. This document includes a series of lookup tables that provide environmental screening levels (ESLs) for the petroleum hydrocarbon constituents of concern based on the environmental media involved and land-use considerations. This RWQCB document was used to develop/propose appropriate site cleanup goals for the site.

3.1 Groundwater Cleanup Goals

Development of corrective action goals for groundwater begins with identification of the beneficial uses of groundwater near the site. To restore or protect the beneficial use with the most stringent numerical standard will protect or restore all other uses. The San Francisco Bay Basin Water Quality Control Plan specifies that the beneficial uses of groundwater beneath the site include municipal, domestic, industrial and agricultural. The ESLs that the RWQCB has established to meet the highest beneficial use criteria are presented in the table below and represent Federal and State drinking water standards.

Beneficial Use Corrective Action Goals or Maximum Contaminant Levels (µg/L)

Compound	Concentration	Basis
Benzene	1.0	Beneficial use (Table A)
Toluene	40	Beneficial use (Table A)
Ethylbenzene	30	Beneficial use (Table A)
Xylenes	20	Beneficial use (Table A)
TPHg	100	Beneficial use (Table A)

According to the well survey conducted by Allwest in April 2002, there are no active drinking water wells within 1,000 feet of the site. Given the site is located along the margin of the San Francisco Bay, it is unlikely that the groundwater in the area would be considered suitable for future potable use. Agricultural and/or industrial use is also not likely, as the surrounding area is primarily residential and commercial.

According to the RWQCB published policies for low risk groundwater cases, at LUST sites where the groundwater is not considered a viable short- or long-term water supply resource, development of short-term groundwater cleanup goals for active remediation that are based on mitigation of human health risks and/or potential environmental impacts to surface water are appropriate. For LUST sites involving gasoline contamination of shallow water tables, the major concern is typically vapor -phase migration into overlying buildings (vapor intrusion) particularly with respect to benzene, a known carcinogen. The beneficial use goals still apply as long-term cleanup goals, but they are generally reached via natural attenuation without the need for long-term monitoring, a formal residual risk management plan, or deed covenant.

In the May 2008 document, the RWQCB has established lookup tables for ESLs for various risks and exposure pathways including mitigation of the vapor intrusion to indoor air pathway, which is addressed in Table E-1. Table E-1 includes ESLs for the gasoline constituents of concern (except for TPHg) at residential areas where groundwater is not a current or potential drinking water resource and the water table is 3 meters bgs. In the absence of an ESL for TPHg in Table E-1, an ESL from Table I-2 based on the odor threshold is used as the proposed corrective action goal for TPHg.

Risk Based Groundwater Corrective Action Goals (µg/L)

Compound	Concentration	Basis
Benzene	540	Vapor intrusion (Table E-1)
Toluene	38,000	Vapor intrusion (Table E-1)
Ethylbenzene	170,000	Vapor intrusion (Table E-1)
Xylenes	160,000	Vapor intrusion (Table E-1)
TPHg	5,000	Odors (Table I-2)

Comparison of the data in Table 2 to the proposed groundwater corrective action goals above indicates active remediation is warranted. The TPHg and/or benzene concentrations in groundwater at Well MW-1 and RW-1 are an order of magnitude above the risk-based goal and two orders of magnitude

above the beneficial use goal. The benzene concentration in groundwater at Boring P-4 is just above the risk-based goal and one order of magnitude above the beneficial use goal.

In general, the RWQCB recommends using soil gas data to assess the vapor intrusion pathway for gasoline constituents in groundwater and unsaturated soils and includes ESLs for soil gas samples collected at 5 feet bgs in Table E-2. The respective ESLs for benzene and TPHg of 0.084 ug/L and 10 ug/L are both very stringent. For the site, it is neither appropriate nor necessary to test soil gas in the target cleanup area given site-specific conditions including depth to water and contaminant levels. Based on the close proximity of heavily impacted saturated soils to the specified soil gas sampling depth and the sandy conditions, it can be safely assumed that TPHg and benzene in shallow soil gas samples would exceed the RWQCB ESLs by several orders of magnitude.

This is essentially a secondary source area cleanup that is intended to protect and restore groundwater quality as well as a risk-based cleanup.

3.2 Soil Cleanup Goals

Since the current investigation data indicates that there is little or no petroleum hydrocarbon contamination in the vadose zone, risk-based cleanup goals for unsaturated soils are not proposed. In the event that petroleum hydrocarbon contamination is encountered in the top 7 feet of soils, the associated gross contamination (odor threshold) ESL for TPHg of 100 ppm, presented in Table B of the RWQCB document, will be used on an interim basis as the soil cleanup goal. As a practical matter, under the proposed remedial excavation alternative, RRM plans to send any suspect unsaturated soils that are encountered within the work zone to a Class II landfill.

As already explained above, in the May 2008 document, the RWQCB includes ESLs for soil-gas samples collected at 5 feet bgs and recommends the use of soil gas data to determine the need for remediation of shallow soils as well as groundwater. For the reasons already stated, RRM does not consider the collection of shallow soil gas samples in the former UST/secondary source area to be necessary at the site given the relatively shallow depth to water and contaminant levels.

The RWQCB has not established ESLs for saturated soils. In general; however, it can be assumed that where ESLs for groundwater are exceeded, the saturated soil in the area requires corrective action.

3.3 Primary Remediation Goal

Since there is no shallow soil contamination at the site, the primary goal of remediation is to restore groundwater to the very stringent risk-based corrective action goal for benzene (540 ug/L) proposed in Section 3.1. This goal is protective of the vapor intrusion exposure pathway under a residential land use scenario. Since the benzene cleanup goal for groundwater is so stringent, meeting this single goal using the chosen remedial approach is expected to mitigate all exposure pathways of concern for all petroleum hydrocarbons of concern.

4.0 CORRECTIVE ACTION ALTERNATIVES

4.1 Elements Common to All Alternatives

Groundwater monitoring is currently part of the existing remediation program, and will be a key aspect of the recommended alternative. Monitoring would be used as a tool to evaluate progress toward corrective action goals and management of the dissolved hydrocarbon plume, and as a means to assess plume stability. Natural processes including biodegradation, dispersion, volatilization, oxidation, and adsorption are expected to occur at the site regardless of the alternative implemented. These natural processes act to reduce soil and groundwater concentrations over time. Research suggests the primary natural attenuation mechanism for petroleum hydrocarbons is biodegradation. Ultimately, no matter what remedial technology is implemented, natural attenuation will be relied upon to complete remediation

4.2 Alternative 1 - Natural Attenuation

The EPA suggests that natural attenuation is applicable as a stand-alone technology in situations where total petroleum hydrocarbon concentrations are below 25,000 ppm in soil; where there is no current or projected groundwater use within a 2-year groundwater travel time from the site; and where there are no potential nearby receptors that the impact could affect[1]. Background information provided in this report suggests that only the first two of these criteria are met for this site and that vapor intrusion is a concern to residential receptors.

The benefits of this alternative are that it there would be minimal disturbance to the site. The greatest potential disadvantage is the length of time required to mitigate hydrocarbon impact as compared to active remedial technologies. EPA computer models project that average remediation times could range between 50 to 200 years. The projections are consistent with the fact that contaminant levels in groundwater at the site are still highly elevated more than three decades after the leaking USTs were removed.

Under this alternative, controls on site use would restrict exposure to the affected media while natural attenuation is progressing. Engineering controls would include a venting system to mitigate the potential for volatilized petroleum hydrocarbons from groundwater to enter the residential building at the site. Institutional controls would include preparation of a residual risk management plan to address containment, management, and monitoring of the groundwater plume. The plan would be consistent with current and projected land and water uses; and would detail contingency plans to address increases in constituent concentrations at down-gradient locations, should increases occur. The residual risk management plan would be a component of a deed covenant and closure plan.

The estimated cost of this alternative, $330,000, includes installation and operation of a venting system for the site building and groundwater monitoring for the assumed ten-year period, preparation and maintenance of a residual risk management plan, and environmental case closure.

1 EPA. 1993. An Overview of Underground Storage Tank Remediation Options, EPA 510-F-93-029. October 1993

4.3 Alternative 2 - Remedial Excavation of Saturated Soils

Under this alternative, the contaminated groundwater would be physically removed from the site by digging out the associated saturated soil interval and purging the excavation of standing water. The proposed excavation area is shown on Figure 7. The boundary was determined based on the comparison of existing saturated soil and groundwater data to the proposed corrective action goals in Section 3.0. Under this scenario, the proposed corrective action goals would be achieved or nearly achieved upon completion of the excavation work.

It is expected that approximately 500 cubic yards of overburden and impacted soil would be removed and off-hauled for disposal; the proposed excavation area measures approximately 25 feet by 30 feet and would extend approximately 18 feet bgs. The soil would be pre-profiled for disposal at Allied Waste's Keller Canyon Landfill in Pittsburg, California. The excavation sidewalls would be shored and braced using sheet piles. Confirmation soil samples would be collected from the excavation bottom and sidewalls. Standing groundwater that seeps into the pit would be extracted, filtered, treated with granular activated carbon and discharged directly to the sanitary sewer under a permit from the City of Alameda. Alternatively, if the recharge rate is low, the water will be removed via vacuum tank truck and off-hauled for treatment at permitted facilities by licensed contractors/haulers. The bottom approximately 4 feet of the excavation would be backfilled with crushed rock, followed by clean imported fill to grade. All placed materials would be compacted to 90% relative density under the supervision of an engineer. Additionally, monitoring wells MW-1 and RW-1, located within the excavation boundary, would be properly destroyed and replaced, as necessary.

The advantages of this alternative, particularly when coupled with removal of impacted standing groundwater within the excavation, are that a majority of the residual contaminant mass would be removed from the site quickly and the alternative can be implemented very quickly. The heavily-impacted groundwater within the targeted area would be physically removed with the saturated soil and the residual impacted groundwater would be extracted from the excavation.

While there will be some lower level contamination left in place peripheral to the excavation boundaries, this residual contamination is expected to decline relatively quickly once the source area has been removed. Another potential benefit of this type of remedial excavation is biodegradation associated with exposure to the atmosphere.

Natural attenuation would be relied upon to completely achieve beneficial use corrective action goals. Follow-up quarterly groundwater monitoring would continue for at least one year after the excavation to establish declining groundwater concentration trends after source removal.

Disadvantages include removal/replacement of the sidewalk and street, difficulties related to underground utilities; site disruption; construction related traffic, noise, odors, and safety concerns; and the relatively large capital cost. It is estimated that the capital cost of this alternative would be $260,000. Groundwater monitoring and reporting for one year would cost approximately $20,000. The total estimated cost for this alternative is $280,000. The capital cost includes groundwater monitoring pre-excavation, pre-profiling of soil, permitting, shoring, excavation, hauling and disposal of excavated soil at a Class II landfill, treatment and disposal of groundwater from the excavation, confirmation sampling,

backfill and compaction, resurfacing, destruction and replacement of groundwater monitoring wells MW-1 and RW-1, reporting, and project management and preparation and submittal of a closure summary report.

4.4 Alternative 3 - Air Sparging-Enhanced Dual Phase Extraction

Under this alternative, an air sparging and dual phase extraction well network would be designed and installed at the site. Existing well RW-1 would be utilized as a dual phase extraction well, and one or more additional extraction wells would likely be necessary. The remediation well network would be situated within the location of the former UST system in the area of elevated dissolved concentrations. Due to site constraints, and to minimize disturbance to the residential tenants of the property, a mobile remediation unit would be used to inject air and collect soil vapor and entrained groundwater. The recovered air-groundwater mixture would be separated and treated before discharge.

Recovered soil vapor would be treated using thermal/catalytic oxidation and groundwater would be treated using granular activated carbon. Other system components would include an air compressor, a high-vacuum pump, a water separation unit, at least three vessels containing aqueous-phase carbon, an electrical distribution and control panel, and conveyance piping. Discharge permits from the Bay Area Air Quality Management District, and City of Alameda would be necessary to discharge treated soil vapor and groundwater.

The most significant potential advantages of this alternative compared to the remedial excavation approach (Alternative 2) include less construction related site disruption and the potential for reduced costs if the system operation period was less than expected. The major disadvantage is that there is considerable uncertainty related to the effectiveness of the process under site-specific conditions and the period of system operation required to meet cleanup goals. Other disadvantages include a potentially much longer period of disruption to site tenants, including noise from remedial equipment.

It is assumed that air sparging-enhanced dual phase extraction would continue for at least two years. As with other alternatives, natural attenuation would be relied upon to completely achieve corrective action goals. Quarterly groundwater monitoring would continue for the operation period plus at least two additional years to monitor groundwater concentrations after termination of active remediation.

It is estimated that the capital cost of this alternative would be $120,000 including initial pilot testing, and the cost of operation over the projected lifespan would be $120,000. Reporting and carbon change out would cost approximately $30,000 over the two-year period. Groundwater monitoring and reporting would cost approximately $40,000. The total estimated cost for this alternative is $310,000. The capital cost includes pilot testing, design, equipment acquisition, permitting, installation, startup, preparation and submittal of a startup report, and preparation and submittal of a closure summary report. The operation cost includes maintenance, system performance monitoring, carbon change out, and reporting. The operation cost does not include utility costs, which could run up to $600 per month.

4.5 Alternative 4 - In-Situ Chemical Oxidation

Under this alternative, sodium persulfate, would be injected into the subsurface to directly oxidize and enhance the natural attenuation of petroleum hydrocarbons at the site. Sodium persulfate was chosen over other oxidants because it is stable and does not generate appreciable amounts of heat or gas, and it is a powerful oxidant that is persistent in the subsurface. A dense network of temporary injection points would be installed using direct-push drilling equipment. The chemical oxidant would be injected under high pressure and low flow in an effort to create a dense network of column-like treatment zones that effectively covers the targeted remediation area; injection would cease when the probe is approximately two feet above the groundwater table. Injection would begin at locations along the periphery of the plume core, followed by injections at the plume core. Upon completion, the temporary injection point would be removed and the boring would be backfilled with cement grout. Performance results would include typical groundwater monitoring parameters, and sampling and analyses for aquifer parameters, metals, and minerals.

The most significant potential advantages of this alternative compared to the remedial excavation approach include less construction related site disruption and potentially lower costs if the process is successful. The major disadvantages are that there is great uncertainty related to the effectiveness of the alternative under site-specific conditions, the number of injection events required to meet cleanup goals, and determination of the fate and transport of contaminant mass following injection. This is an emerging remediation technology that would require a laboratory bench-scale test and a pilot study prior to implementation at the site. In general, the major limitation of this type of approach is the inability to achieve a significant degree of mixing in the subsurface. The injected fluids tend to push/displace contaminated groundwater rather than mixing with it and also tend to follow preferential pathways rather than disbursing as intended. Damage to subsurface utilities is a major concern when considering the use of in-situ chemical oxidation especially where the contaminated interval is relatively shallow and under public streets and sidewalks (utility corridors). Based on the results of the recent utility survey, this concern is significant at this site (see Figure 2).

It is assumed, that several injection events would be conducted during the first year, and follow-up events would be conducted in the second year, if necessary. As with other alternatives, natural attenuation would be relied upon to completely achieve corrective action goals. Groundwater monitoring would continue for the operation period plus one additional year to monitor groundwater concentrations after the injection is complete.

It is estimated that the initial treatability studies and pilot testing to establish feasibility would cost $70,000. The capital cost of actually implementing this alternative if deemed feasible is also estimated at $70,000. The cost of intermittent operations over the two years is estimated at $20,000. The cost of extensive confirmation sampling to make sure contamination is not being displaced is estimated at $50,000. Groundwater monitoring and reporting would cost approximately $60,000. The total estimated cost for this alternative is $270,000 assuming reasonable effectiveness. The capital cost includes three five-day injection events, reporting and preparation and submittal of a closure summary report. The operation cost includes additional monitoring parameters to evaluate oxidation performance over the two-year period.

5.0 ALTERNATIVE EVALUATION

Alternatives were ranked according to regulatory and community acceptance; reduction of toxicity, mobility, and volume of contaminates (likelihood of achieving remedial objectives); technical feasibility; and cost.

5.1 Regulatory and Community Acceptance

Alternative 1 has the lowest ranking because the regulatory and community acceptance of taking no action and leaving hydrocarbons in place for an extended period without any active remediation is generally low if there are other viable alternatives. Regulatory acceptance would likely be higher for Alternatives 2 and 3 when compared to Alternatives 4, primarily because these alternatives use conventional remedial approaches and do not involve the use of hazardous substances. Alternative 2 is ranked slightly over Alternative 3 despite the fact that is arguably the most disruptive to the community at least on the short term. It is favored over the other alternatives because it would quickly advance site conditions toward meeting corrective action goals and is the most reliable approach.

5.2 Reduction of Toxicity, Mobility, and Volume of Contaminates

All the alternatives will eventually allow for a complete reduction in toxicity, mobility, and volume of hydrocarbons. However, Alternatives 2 through 4 would provide much higher rates. Since all the alternatives eventually provide complete reduction, the rate of reliable short-term reduction is used to rank alternatives.

As already stated, Alternative 1 is associated with very slow-paced mass reduction and is ranked lowest. The mass removal rates for the two in-situ alternatives (Alternatives 3 and 4) are ranked equally above Alternative 1, but below Alternative 2, because these technologies are limited by varied subsurface conditions and the effectiveness is generally less than expected. As such, Alternative 2 is ranked highest because it would reliably reduce mass very quickly. The permanent placement of petroleum contaminated soils in a secure Class II facility is considered an environmentally viable and acceptable method of reducing toxicity, mobility, and volume.

5.3 Technical Feasibility

The technical feasibility of the alternatives was evaluated by considering effectiveness and implementation. With regard to implementation, Alternative 1 receives the highest rating because it involves very little construction. Alternative 4 is the most difficult to implement, because of the preliminary work that would be needed to demonstrate viability. Between Alternatives 2 and 3 it is likely Alternative 3 would be slightly easier to implement, as it requires fewer resources than Alternative 2.

In regard to short-term effectiveness, Alternative 2 is ranked highest. In the mid- to long-term, all the alternatives approach parity because natural attenuation would be relied upon to reduce residual contaminant levels.

5.4 Cost

Under this criterion, alternatives were ranked according to the projected cost presented for each alternative. On this basis, Alternative 4, ranks the highest, followed by Alternatives 2 and 3, with Alternative 1 ranked lowest.

6.0 RECOMMENDED ALTERNATIVE

Given the evaluation above, Alternative 2 (Remedial Excavation) appears to be the best option for remediation of site groundwater to proposed risk-based corrective action goals. While this alternative is not the projected lowest cost option, the estimated costs for Alternatives 2, 3, and 4 are not far enough apart for the differences to be considered an over-riding factor. The overall costs of Alternative 2 will likely be the lowest, as Alternatives 3 and 4 are not expected to reduce concentrations to meet cleanup goals in a timely manner. Also, it is the optimal approach, with respect to short-term effectiveness, as it will completely remove the contamination in the targeted area in a very short period of time and ensure that corrective action goals are met quickly. Though the recommended alternative will cause some disruption to the site tenants and local community, the disruption will only be for a relatively short period. Implementation will occur over approximately two to three months with the actual excavation work at the site spanning approximately two weeks. The alternative will include well replacement and one year of quarterly follow-up groundwater monitoring.

PROFESSIONAL CERTIFICATION

CORRECTIVE ACTION PLAN

900 CENTRAL AVENUE CORRECTIVE ACTION ACCOUNT

900 CENTRAL AVENUE

ALAMEDA, CALIFORNIA

I certify under penalty of law that this document and all attachments have been prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who managed the system, or those persons directly responsible for gathering the information, to the best of my knowledge and belief the information submitted is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations.

Evaluation of the geological conditions at the site for the purpose of this corrective action plan is inherently limited due to the number of observation points. There may be variations in subsurface conditions in areas away from the sample points. Data from this report reflect the sample conditions at specific locations at a specific point in time. No other interpretations, representations, warranties, guarantees, express or implied, are included.

Sincerely,

Matt Kaempf
Project Manager

Matt Paulus
Senior Geologist
PG 8193

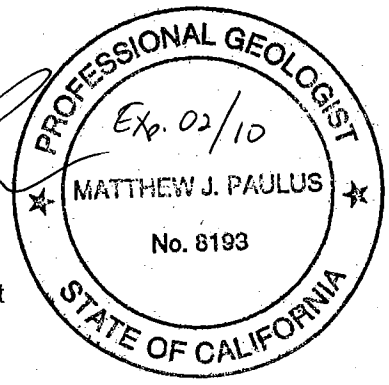


Table 1
Well Specifications

900 Central Avenue
Alameda, California

Well	Total Depth (feet, bgs)	Casing Diameter (inch)	Screened Interval (feet, bgs)	Screen Length (feet)
MW-1	18	2	6 - 18	12
MW-2	19.5	2	6 - 19.5	13.5
MW-3	18	2	6 - 18	12
MW-4	18	2	6 - 18	12
MW-5	18	2	6 - 18	12
MW-6	18	2	6 - 18	12
RW-1	20	4	5 - 20	15

Notes:

bgs = below ground surface

Table 2
Groundwater Elevation and Analytical Data

900 Central Avenue
Alameda, California

Sample ID	Date Gauged & Sampled	Well Elevation (feet, MSL)	Depth to Water (feet, TOC)	Groundwater Elevation (feet, MSL)	TPHg (ppb)	Benzene (ppb)	Toluene (ppb)	Ethyl-benzene (ppb)	Total Xylenes (ppb)	MtBE (ppb)	TPHd (ppb)	TPHmo (ppb)	Notes
Monitoring Wells													
MW-1	11/27/98	25.17	11.77	13.40	360	5.8	5.5	9.2	40	<5.0	<50	<500	
	03/12/99		6.59	18.58	<50	<0.50	<0.50	<0.50	<0.50	<5.0	<50	<500	
	06/01/99		8.71	16.46	930	<0.50	19	52	230	<5.0	540	<500	
	09/03/99		11.79	13.38	14,000	300	1,900	890	5,600	<5.0	2,100	<500	
	03/29/02		8.32	16.85	<50	<0.50	<0.50	<0.50	<0.50	<0.50	61	<610	
	07/15/02		11.39	13.78	39,000	1,700	2,900	1,800	7,800	<10	4,200	<5000	
	10/03/02		12.88	12.29	42,000	2,600	3,300	1,800	10,000	<500	8,400	<2500	
	02/05/07		10.40	14.77	26,000	2,550	2,010	1,140	4,870	<0.5	NA	NA	1
	05/04/07		9.77	15.40	28,000	2,080	1,820	739	5,500	NA	NA	NA	1
	08/23/07	28.27	12.23	16.04	56,700	2,570	2,370	1,120	9,560	<11	NA	NA	1,3
	11/28/07		12.94	15.33	51,700	3,160	3,270	1,050	9,250	<11.0	NA	NA	1,3
	02/28/08		8.10	20.17	<50	<0.500	<0.500	<0.500	<1.50	NA	NA	NA	4
	06/03/08		11.40	16.87	11,000	1,060	2,080	784	4,370	NA	NA	NA	1,5
	09/04/08		13.23	15.04	66,000	4,000	5,410	62.0	11,700	NA	NA	NA	1
	11/06/08		**13.76**	**14.51**	**100,000**	**2,870**	**5,160**	**1,720**	**13,800**	**NA**	**NA**	**NA**	
MW-2	11/27/98	25.12	11.76	13.41	<50	<0.50	<0.50	<0.50	<0.50	<5.0	<50	<500	
	03/12/99		6.53	18.64	<50	<0.50	<0.50	<0.50	<0.50	<5.0	<50	<500	
	06/01/99		8.56	16.61	<50	<0.50	<0.50	<0.50	<0.50	<5.0	<50	<500	
	09/03/99		11.60	13.57	<50	<0.50	<0.50	<0.50	1.8	<5.0	<50	<500	
	03/29/02		8.10	17.07	<50	<0.50	<0.50	<0.50	<0.50	<5.0	<50	<500	
	07/15/02		10.92	14.25	<50	<0.50	<0.50	<0.50	<0.50	<5.0	<50	<500	
	10/03/02		DRY	--	NS	NS	NS	NS	NS	NS	NS	NS	
	02/05/07		10.15	15.02	89	<0.5	<0.5	<0.5	<1.50	<0.5	NA	NA	1,2
	05/04/07		9.43	15.74	<50	<0.500	<0.500	<0.500	<1.50	NA	NA	NA	1
	08/23/07	28.31	11.94	16.37	<50	<0.500	<0.500	<0.500	<1.50	<0.500	NA	NA	1
	11/28/07		12.67	15.64	<50	<0.500	<0.500	<0.500	<1.50	<0.500	NA	NA	1
	02/28/08		7.89	20.42	<50	<0.500	<0.500	<0.500	<1.50	NA	NA	NA	4
	06/03/08		11.07	17.24	<50	<0.500	<0.500	<0.500	<1.50	NA	NA	NA	1
	09/04/08		12.95	15.36	<50	<0.500	<0.500	<0.500	<1.50	NA	NA	NA	1
	11/06/08		**13.52**	**14.79**	**52**	**<0.500**	**<0.500**	**<0.500**	**<1.50**	**NA**	**NA**	**NA**	**3**

Table 2
Groundwater Elevation and Analytical Data

900 Central Avenue
Alameda, California

Sample ID	Date Gauged & Sampled	Well Elevation (feet, MSL)	Depth to Water (feet, TOC)	Groundwater Elevation (feet, MSL)	TPHg (ppb)	Benzene (ppb)	Toluene (ppb)	Ethyl-benzene (ppb)	Total Xylenes (ppb)	MtBE (ppb)	TPHd (ppb)	TPHmo (ppb)	Notes
MW-3	11/27/98	24.58	11.41	13.76	<50	<0.50	<0.50	<0.50	<0.50	<5.0	<50	<500	
	03/12/99		6.01	19.16	<50	<0.50	<0.50	<0.50	<0.50	<5.0	<50	<500	
	06/01/99		8.16	17.01	<50	<0.50	<0.50	<0.50	<0.50	<5.0	<50	<500	
	09/03/99		11.27	13.90	<50	<0.50	<0.50	<0.50	<0.50	<5.0	<50	<500	
	03/29/02		7.78	17.39	<50	<0.50	<0.50	<0.50	<0.50	<0.50	<50	<500	
	07/15/02		10.82	14.35	<50	<0.50	<0.50	<0.50	<0.50	<0.50	110	<500	
	10/03/02		12.28	12.89	<50	<0.50	<0.50	<0.50	<0.50	<5.0	<50	<500	
	02/05/07		9.85	15.32	<50	<0.5	<0.5	<0.5	<1.50	<0.5	NA	NA	1
	05/04/07		9.19	15.98	<50	<0.500	<0.500	<0.500	<1.50	NA	NA	NA	1
	08/23/07	27.69	11.63	16.06	<50	<0.500	<0.500	<0.500	<1.50	<0.500	NA	NA	1
	11/28/07		12.31	15.38	<50	<0.500	<0.500	<0.500	<1.50	<0.500	NA	NA	1
	02/28/08		7.46	20.23	<50	<0.500	<0.500	<0.500	<1.50	NA	NA	NA	4
	06/03/08		10.82	16.87	<50	<0.500	<0.500	<0.500	<1.50	NA	NA	NA	1
	09/04/08		12.62	15.07	<50	<0.500	<0.500	<0.500	<1.50	NA	NA	NA	1
	11/06/08		**13.20**	**14.49**	**<50**	**<0.500**	**<0.500**	**<0.500**	**<1.50**	**NA**	**NA**	**NA**	
MW-4	08/23/07	27.37	11.73	15.64	<50	<0.500	<0.500	<0.500	<1.50	<0.500	NA	NA	1
	11/28/07		12.43	14.94	<50	<0.500	<0.500	<0.500	<1.50	<0.500	NA	NA	1
	02/28/08		7.81	19.56	<50	<0.500	<0.500	<0.500	<1.50	NA	NA	NA	4
	06/03/08		10.99	16.38	<50	<0.500	<0.500	<0.500	<1.50	NA	NA	NA	1
	09/04/08		12.68	14.69	<50	<0.500	<0.500	<0.500	<1.50	NA	NA	NA	1
	11/06/08		**13.25**	**14.12**	**<50**	**<0.500**	**<0.500**	**<0.500**	**<1.50**	**NA**	**NA**	**NA**	
MW-5	08/23/07	27.25	11.56	15.69	<50	<0.500	<0.500	<0.500	<1.50	<0.500	NA	NA	1
	11/28/07		12.29	14.96	<50	<0.500	<0.500	<0.500	<1.50	<0.500	NA	NA	1
	02/28/08		7.55	19.70	<50	<0.500	<0.500	<0.500	<1.50	NA	NA	NA	4
	06/03/08		10.84	16.41	<50	<0.500	<0.500	<0.500	<1.50	NA	NA	NA	1
	09/04/08		12.53	14.72	<50	<0.500	<0.500	<0.500	<1.50	NA	NA	NA	1
	11/06/08		**13.12**	**14.13**	**<50**	**<0.500**	**<0.500**	**<0.500**	**<1.50**	**NA**	**NA**	**NA**	
MW-6	08/23/07	27.24	11.52	15.72	<50	<0.500	<0.500	<0.500	<1.50	<0.500	NA	NA	1
	11/28/07		12.24	15.00	<50	<0.500	<0.500	<0.500	<1.50	<0.500	NA	NA	1
	02/28/08		7.43	19.81	<50	<0.500	<0.500	<0.500	<1.50	NA	NA	NA	4
	06/03/08		10.81	16.43	<50	<0.500	<0.500	<0.500	<1.50	NA	NA	NA	1
	09/04/08		12.51	14.73	<50	<0.500	<0.500	<0.500	<1.50	NA	NA	NA	1
	11/06/08		**13.10**	**14.14**	**<50**	**<0.500**	**<0.500**	**<0.500**	**<1.50**	**NA**	**NA**	**NA**	

Table 2
Groundwater Elevation and Analytical Data

900 Central Avenue
Alameda, California

Sample ID	Date Gauged & Sampled	Well Elevation (feet, MSL)	Depth to Water (feet, TOC)	Groundwater Elevation (feet, MSL)	TPHg (ppb)	Benzene (ppb)	Toluene (ppb)	Ethyl-benzene (ppb)	Total Xylenes (ppb)	MtBE (ppb)	TPHd (ppb)	TPHmo (ppb)	Notes
RW-1	08/23/07	27.43	11.23	16.20	16,000	<4.40	38.9	571	2,660	<4.40	NA	NA	1,3
	11/28/07		11.97	15.46	24,400	4.75	110	915	3,980	<4.40	NA	NA	1,3
	02/28/08		7.22	20.21	10,100	<4.40	40.3	256	1,430	NA	NA	NA	1,3
	06/03/08		10.41	17.02	40,000	<4.40	120	1,100	8,810	NA	NA	NA	1, 5
	09/04/08		12.25	15.18	17,000	<4.40	41.1	640	3,290	NA	NA	NA	1, 5
	11/06/08		**12.75**	**14.68**	**19,000**	**<4.40**	**28.1**	**369**	**2,340**	**NA**	**NA**	**NA**	**6**
Grab Groundwater Samples													
EB-1	04/20/94	NA	NA	NA	76,000	2,200	8,800	2,500	1,600	NA	16,000	<1,000	7
EB-2	04/20/94	NA	NA	NA	<50	<0.5	<0.5	<0.5	<0.5	NA	<50	720	
EB-3	04/20/94	NA	NA	NA	<50	<0.5	<0.5	<0.5	<0.5	NA	<50	820	
P-1-W	06/30/97	NA	NA	NA	<50	<0.5	<0.5	<0.5	<0.5	NA	NA	NA	
P-2-W	06/30/97	NA	NA	NA	290	2.4	2.1	1.4	3.1	NA	<100	<1,000	
P-3-W	06/30/97	NA	NA	NA	92,000	190	5,000	4,600	24,000	NA	<100	<1,000	
P-4-W	06/30/97	NA	NA	NA	17,000	610	720	940	3,800	NA	<100	<1,000	
P-5-W	06/30/97	NA	NA	NA	<50	<0.5	<0.5	<0.5	<0.5	NA	NA	NA	
P-6-W	06/30/97	NA	NA	NA	<50	<0.5	<0.5	<0.5	<0.5	NA	NA	NA	
P-7-W	06/30/97	NA	NA	NA	66	2.3	6.5	0.8	4.7	NA	NA	NA	
P-8-W	06/30/97	NA	NA	NA	51	1.7	5.1	0.55	2.4	NA	NA	NA	

Notes:

MSL = relative to mean sea level
TOC = top of casing
TPHg = gasoline range total petroleum hydrocarbons
TPHd = diesel range total petroleum hydrocarbons
TPHmo = motor oil range total petroleum hydrocarbons
TBA = tert-Butanol
MtBE = Methyl tert-Butyl Ether
ppb = parts per billion (micrograms per liter)
< = none detected at or above reported detection limit
NS = not sampled
NA = not analyzed

1 = also sampled for the fuel oxygenates ethyl tert-butyl ether (ETBE), isopropyl ether (DIPE), t-butyl alcohol (t-butanol) (TBA), and tert-amyl methyl ether (TAME); none of these compounds detected above the laboratory limit.
2 = the laboratory reported value due to discrete peaks present within the TPH as gasoline quantitation range (heavy end); not typical gasoline.
3 = the laboratory reported results are elevated due to non-target compounds within the gasoline range
4 = also sampled for the fuel oxygenates ethyl tert-butyl ether (ETBE), t-butyl alcohol (t-butanol) (TBA), and tert-amyl methyl ether (TAME); none of these compounds detected above the laboratory limit.
5 = laboratory noted that although TPH as gasoline constituents are present, TPH value includes a significant portion of non-target hydrocarbons present within gasoline range.
6 = Although TPH as Gasoline compounds are present, result includes heavy end hydrocarbons within the C5 - C12 quantitation range (possibly aged gasoline).
7 = TPHd result characterized by laboratory as non-diesel mix (C_5-C_{20})

Table 3
Soil Analytical Data

900 Central Avenue
Alameda, California

Sample ID	Date	Depth (feet, bgs)	TPHg (mg/kg)	Benzene (mg/kg)	Toluene (mg/kg)	Ethyl-benzene (mg/kg)	Total Xylenes (mg/kg)	MtBE (mg/kg)	TPHd (mg/kg)	TPHmo (mg/kg)	TPHss (mg/kg)	TPHk (mg/kg)	VOCs (mg/kg)
SB-1-7.5	08/09/07	7.5	0.79	<0.010	<0.010	<0.010	0.034	NA	NA	NA	NA	NA	NA
SB-1-12	08/09/07	12	2,600	<3.3	<3.3	31	200	NA	NA	NA	NA	NA	NA
SB-1-16	08/09/07	16	11	<0.010	<0.010	0.31	1.7	NA	NA	NA	NA	NA	NA
SB-1-20	08/09/07	20	<0.50	<0.010	<0.010	<0.010	<0.010	NA	NA	NA	NA	NA	NA
SB-1-24	08/09/07	24	<0.50	<0.010	<0.010	<0.010	<0.010	NA	NA	NA	NA	NA	NA
SB-2-8	08/09/07	8	<0.50	<0.010	<0.010	<0.010	<0.010	NA	NA	NA	NA	NA	NA
SB-2-11.5	08/09/07	11.5	<0.50	<0.010	<0.010	<0.010	<0.010	NA	<5.0	<10	<5.0	<5.0	NA
SB-2-16	08/09/07	16	<0.50	<0.010	<0.010	<0.010	<0.010	NA	NA	NA	NA	NA	NA
SB-2-20	08/09/07	20	<0.50	<0.010	<0.010	<0.010	<0.010	NA	NA	NA	NA	NA	NA
SB-2-24	08/09/07	24	<0.50	<0.010	<0.010	<0.010	<0.010	NA	NA	NA	NA	NA	NA
SB-3-8	08/09/07	8	<0.50	<0.010	<0.010	<0.010	<0.010	NA	NA	NA	NA	NA	NA
SB-3-12	08/09/07	12	<0.50	<0.010	<0.010	<0.010	<0.010	NA	NA	NA	NA	NA	NA
SB-3-16	08/09/07	16	<0.50	<0.010	<0.010	<0.010	<0.010	NA	NA	NA	NA	NA	NA
SB-4-8	08/09/07	8	5.1	<0.050	<0.050	<0.050	<0.100	<0.050	<5.0	<10	<5.0	<5.0	ND
SB-5-8	08/09/07	8	<0.50	<0.010	<0.010	<0.010	<0.010	NA	NA	NA			
SB-5-10.5	08/09/07	10.5	<0.10	<0.005	<0.005	<0.005	<0.010	<0.0050	<5.0	<10	<5.0	<5.0	ND
SB-6-8	08/09/07	8	<0.50	<0.010	<0.010	<0.010	<0.010	NA	NA	NA	NA	NA	NA
SB-6-12	08/09/07	12	<0.50	<0.010	<0.010	<0.010	<0.010	NA	NA	NA	NA	NA	NA
SB-6-16	08/09/07	16	<0.50	<0.010	<0.010	<0.010	<0.010	NA	NA	NA	NA	NA	NA
MW-4-6	06/22/07	6	<0.50	<0.010	<0.010	<0.010	<0.010	NA	NA	NA	NA	NA	NA
MW-4-10.5	06/22/07	10.5	<0.50	<0.010	<0.010	<0.010	<0.010	NA	NA	NA	NA	NA	NA
MW-4-16.5	06/22/07	16.5	<0.50	<0.010	<0.010	<0.010	<0.010	NA	NA	NA	NA	NA	NA
MW-5-7.5	06/22/07	8	<0.50	<0.010	<0.010	<0.010	<0.010	NA	NA	NA	NA	NA	NA
MW-5-10.5	06/22/07	10.5	<0.50	<0.010	<0.010	<0.010	<0.010	NA	NA	NA	NA	NA	NA
MW-5-15	06/22/07	15.0	<0.50	<0.010	<0.010	<0.010	<0.010	NA	NA	NA	NA	NA	NA

Table 3
Soil Analytical Data

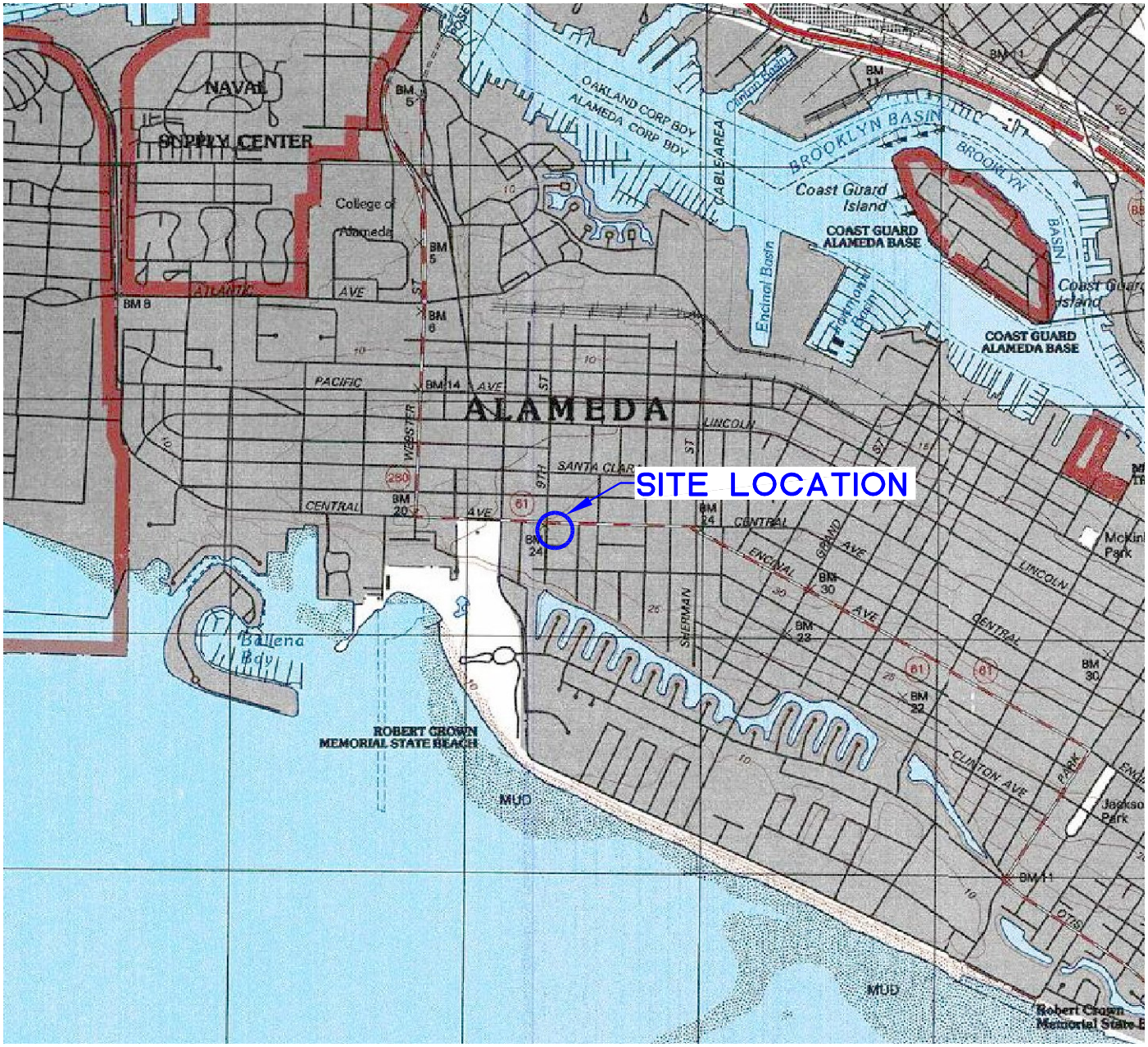
900 Central Avenue
Alameda, California

Sample ID	Date	Depth (feet, bgs)	TPHg (mg/kg)	Benzene (mg/kg)	Toluene (mg/kg)	Ethyl-benzene (mg/kg)	Total Xylenes (mg/kg)	MtBE (mg/kg)	TPHd (mg/kg)	TPHmo (mg/kg)	TPHss (mg/kg)	TPHk (mg/kg)	VOCs (mg/kg)
MW-6-5	06/22/07	5	<0.50	<0.010	<0.010	<0.010	<0.010	NA	NA	NA	NA	NA	NA
MW-6-10.5	06/22/07	10.5	<0.50	<0.010	<0.010	<0.010	<0.010	NA	NA	NA	NA	NA	NA
MW-6-17	06/22/07	17	<0.50	<0.010	<0.010	<0.010	<0.010	NA	NA	NA	NA	NA	NA
EB-1[a]	04/20/94	14.5	95	0.4	0.5	0.9	5.2	NA	39	<10	NA	NA	NA
EB-2[a]	04/20/94	16.5	<1.0	<0.005	<0.005	<0.005	<0.005	NA	<5	<10	NA	NA	NA
EB-3[a]	04/20/94	14.5	<1.0	<0.005	<0.005	<0.005	<0.005	NA	<5	<10	NA	NA	ND
P-1-11[b]	06/97	11	ND	ND	ND	ND	ND	NA	NA	NA	NA	NA	NA
P-2-10.5[b]	06/97	10.5	ND	ND	ND	ND	ND	NA	NA	NA	NA	NA	NA
P-2-12.5[b]	06/97	12.5	ND	ND	ND	ND	ND	NA	NA	NA	NA	NA	NA
P-3-11[b]	06/97	11	ND	ND	ND	ND	ND	NA	NA	NA	NA	NA	NA
P-3-14.5[b]	06/97	14.5	4,600	ND	15	110	590	NA	NA	NA	NA	NA	NA
P-4-13[b]	06/97	13	ND	ND	ND	ND	ND	NA	NA	NA	NA	NA	NA
P-4-15.5[b]	06/97	15.5	1.1	0.011	0.0092	0.03	0.066	NA	NA	NA	NA	NA	NA
P-5-11.5[b]	06/97	11.5	ND	ND	ND	ND	ND	NA	NA	NA	NA	NA	NA
P-6-10.5[b]	06/97	10.5	ND	ND	ND	ND	ND	NA	NA	NA	NA	NA	NA
P-7-9.5[b]	06/97	9.5	ND	ND	ND	ND	ND	NA	NA	NA	NA	NA	NA
P-8-9.5[b]	06/97	9.5	ND	ND	ND	ND	ND	NA	NA	NA	NA	NA	NA

Notes:

TPHg = gasoline range total petroleum hydrocarbons
TPHd = diesel range total petroleum hydrocarbons
TPHmo = motor oil range total petroleum hydrocarbons
TPHss = Stoddard range total petroleum hydrocarbons
TPHk = kerosene total petroleum hydrocarbons
MtBE = Methyl tert-Butyl Ether
a = Work performed by Lowney Associates on April 4, 1994.
b = Work performed by Allwest in 1997.

mg/kg = milligrams per kilogram
bgs = below ground surface
< = none detected at or above reported detection limit
ND = not detected
NA = not analyzed



QUADRANGLE LOCATION

N

SCALE IN FEET

0 2,000

Ref. KCE514/KCE514-SLM.DWG
Base Map from TOPO!© NGH

PREPARED BY

RRM ENVIRONMENTAL ENGINEERING GEOLOGY

SITE LOCATION MAP

900Central Avenue
Alameda, California

FIGURE:
1

PROJECT:
KCE514

COMMERCIAL/RESIDENTIAL

COMMERCIAL/RESIDENTIAL

8"ø PLASTIC

3"ø PLASTIC

6"ø

4"ø

M.H.

6"ø

56'

CENTRAL AVENUE

8"ø

M.H.

4"ø PLASTIC

2"ø PLASTIC (4"ø CAST ENCASED)

A'

SB-5

SB-4

RW-1

SB-1

SB-3

SUSPECT FORMER UST

SIDEWALK

MW-4

8"ø

MW-2

P-3

P-1

FENCE/PROPERTY BOUNDARY

EB-1

P-2

SB-2

MW-1

P-4

FORMER CANOPY

MW-5

SB-6

EB-2

NINTH STREET

SIDEWALK

RESIDENTIAL

MW-3

APARTMENT BUILDING

P-5

MOVIE THEATER (FORMER CHURCH)

A

MW-6

EB-3

FORMER STATION/GARAGE

36'

P-6

P-7

P-8

RESIDENTIAL

1 1/4"ø PLASTIC

EXPLANATION

MW-1 GROUNDWATER MONITORING WELL LOCATION

P-1 EXPLORATORY SOIL BORING/GRAB GROUNDWATER SAMPLE LOCATION, (1997)

EB-1 EXPLORATORY SOIL BORING/GRAB GROUNDWATER SAMPLE LOCATION, (1994)

SB-1 EXPLORATORY SOIL BORING LOCATION, (2007)

RW-1 RECOVERY WELL LOCATION

UTILITY – PG&E (GAS)

UTILITY – WATER

UTILITY – STORM DRAIN

UTILITY – SANITARY SEWER

M.H. MANHOLE

A A' LINE OF GEOLOGIC CROSS SECTION

N

SCALE IN FEET

0 20

Ref. KCE514/KCE514-EXTENDED.DWG
Basemap from All West

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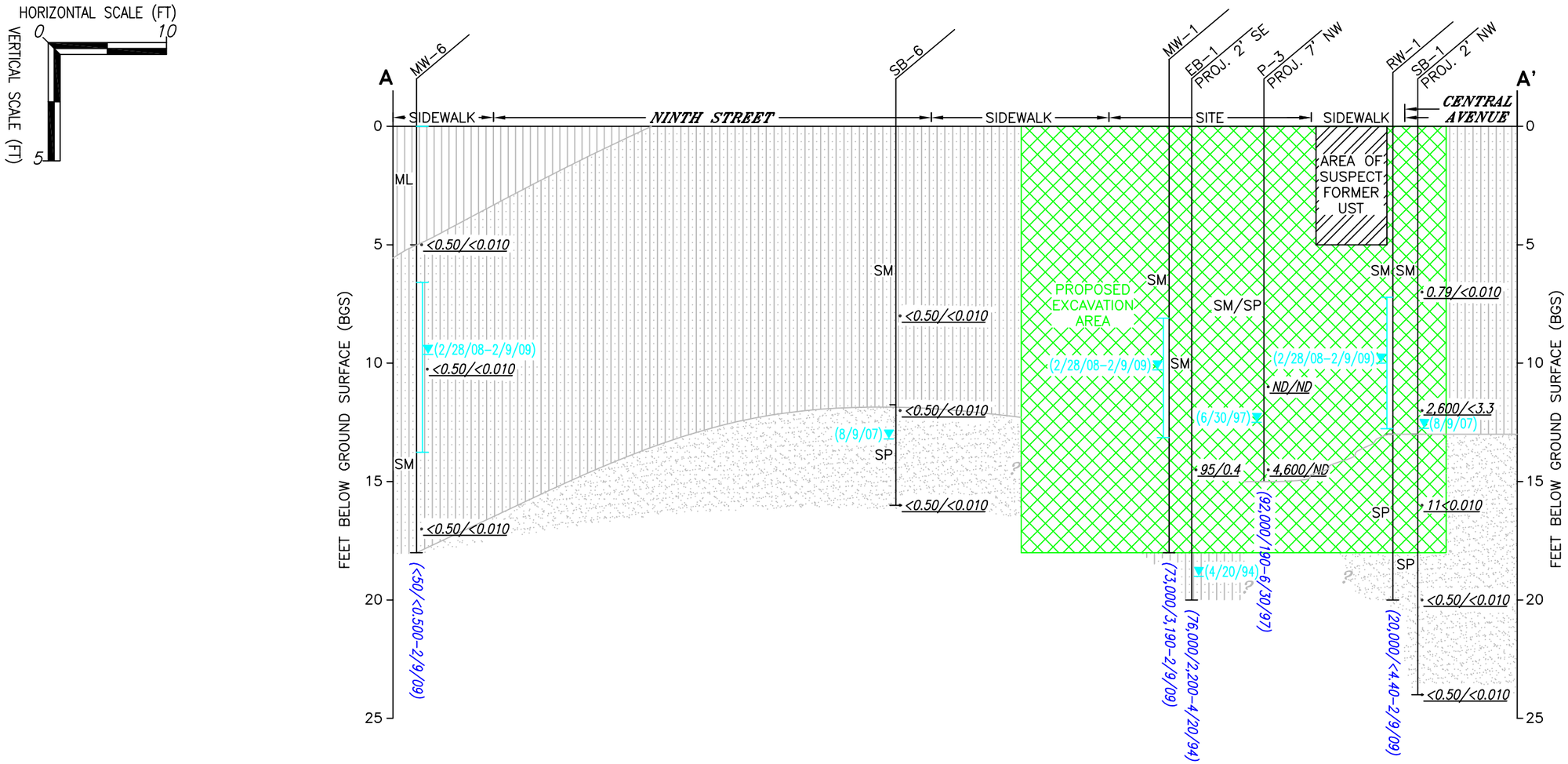
EXTENDED SITE MAP

900 Central Avenue
Alameda, California

FIGURE:
2

PROJECT:
KCE514



EXPLANATION

520/6.8 TPHg/BENZENE CONCENTRATIONS IN SOIL IN MILLIGRAMS PER KILOGRAM (mg/kg)

ND NOT DETECTED AT OR ABOVE LABORATORY REPORTING LIMITS

(<50/<0.500) TPHg/BENZENE CONCENTRATIONS IN GROUNDWATER IN MICROGRAMS PER LITER (ug/L)

2/9/09 GROUNDWATER SAMPLE DATE

GROUNDWATER DEPTH

GROUNDWATER DEPTH RANGE

(2/9/09) GROUNDWATER DEPTH MEASUREMENT DATE/RANGE

ML: SILT

SM: SILTY SAND

SP: SAND

PREPARED BY

GEOLOGIC CROSS SECTION A-A'

900 Central Avenue
Alameda, California

FIGURE:
3
PROJECT:
KCE514

Ref. KCE514/KCE514_X-SEC_A-A.DWG

COMMERCIAL/RESIDENTIAL

COMMERCIAL/RESIDENTIAL

8"ø PLASTIC

3"ø PLASTIC

6"ø

4"ø

M.H.

6"ø

CENTRAL AVENUE

56'

8"ø

M.H.

4"ø PLASTIC

2"ø PLASTIC (4"ø CAST ENCASED)

SB-5

SB-4

(14.66)

RW-1

SB-1

SB-3

SUSPECT FORMER UST

SIDEWALK

MW-4 (14.07)

8"ø

NINTH STREET

MW-2 (14.81)

FENCE/PROPERTY BOUNDARY

P-3

P-2

P-1

EB-1

SB-2

MW-1 (14.51)

0.01

P-4

FORMER CANOPY

14.75

MW-5 (14.09)

SB-6

EB-2

(14.48)

MW-3

SIDEWALK

APARTMENT BUILDING

RESIDENTIAL

P-5

14.50

EB-3

FORMER STATION/GARAGE

MW-6 (14.10)

14.25

36'

P-6

P-7

P-8

RESIDENTIAL

1 1/4"ø PLASTIC

MOVIE THEATER (FORMER CHURCH)

EXPLANATION

MW-1 GROUNDWATER MONITORING WELL LOCATION

P-1 EXPLORATORY SOIL BORING/GRAB GROUNDWATER SAMPLE LOCATION, (1997)

EB-1 EXPLORATORY SOIL BORING/GRAB GROUNDWATER SAMPLE LOCATION, (1994)

SB-1 EXPLORATORY SOIL BORING LOCATION, (2007)

RW-1 RECOVERY WELL LOCATION

UTILITY – PG&E (GAS)

UTILITY – WATER

UTILITY – STORM DRAIN

UTILITY – SANITARY SEWER

M.H. MANHOLE

(14.66) GROUNDWATER ELEVATION, FT/MSL

14.25 GROUNDWATER ELEVATION CONTOUR, FT/MSL

0.01 APPROXIMATE GROUNDWATER FLOW DIRECTION; APPROXIMATE GRADIENT = 0.01 FT/FT

N

SCALE IN FEET

0 20

Ref. KCE514/KCE514-EXTENDED.DWG
Basemap from All West

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RRM

GROUNDWATER ELEVATION CONTOUR MAP, FEBRUARY 9, 2009

900 Central Avenue
Alameda, California

FIGURE: 4

PROJECT: KCE514

COMMERCIAL/RESIDENTIAL

COMMERCIAL/RESIDENTIAL

8"ø PLASTIC
3"ø PLASTIC

6"ø
4"ø

M.H.

6"ø

CENTRAL AVENUE

56'

M.H.

8"ø

4"ø PLASTIC

2"ø PLASTIC (4"ø CAST ENCASED)

20,000

SB-5
SB-4
RW-1
EB-1
SB-1
SB-3

SUSPECT FORMER UST

SIDEWALK

MW-4 <50

8"ø

MW-2 <50

P-1

P-3

EB-1

P-2

MW-1

SB-2

10,000
1,000
100

73,000

FENCE/PROPERTY BOUNDARY

P-4

FORMER CANOPY

MW-5 <50

SB-6

EB-2

NINTH STREET

SIDEWALK

RESIDENTIAL

MW-3 <50

APARTMENT BUILDING

P-5

MW-6 <50

EB-3

FORMER STATION/GARAGE

36'

P-6

P-7

P-8

RESIDENTIAL

1 1/4"ø PLASTIC

MOVIE THEATER (FORMER CHURCH)

EXPLANATION

MW-1	GROUNDWATER MONITORING WELL LOCATION
P-1	EXPLORATORY SOIL BORING/GRAB GROUNDWATER SAMPLE LOCATION, (1997)
EB-1	EXPLORATORY SOIL BORING/GRAB GROUNDWATER SAMPLE LOCATION, (1994)
SB-1	EXPLORATORY SOIL BORING LOCATION, (2007)
RW-1	RECOVERY WELL LOCATION
— — —	UTILITY – PG&E (GAS)
— — —	UTILITY – WATER
———	UTILITY – STORM DRAIN
— · — · —	UTILITY – SANITARY SEWER
M.H.	MANHOLE
20,000	TPHg CONCENTRATIONS IN GROUNDWATER IN MICROGRAMS PER LITER (ug/L)
10,000	TPHg ISOCONCENTRATION CONTOUR (DASHED WHERE INFERRED)
<	NOT DETECTED AT OR ABOVE VALUE SHOWN
TPHg	GASOLINE RANGE TOTAL PETROLEUM HYDROCARBONS

N

SCALE IN FEET

0 20

Ref. KCE514/KCE514-EXTENDED.DWG
Basemap from All West

PREPARED BY RRM

TPHg GROUNDWATER ISOCONCENTRATION MAP, FEBRUARY 9, 2009

900 Central Avenue
Alameda, California

FIGURE:
5
PROJECT:
KCE514

COMMERCIAL/RESIDENTIAL

COMMERCIAL/RESIDENTIAL

8"ø PLASTIC
3"ø PLASTIC

6"ø
4"ø

M.H.

6"ø

CENTRAL AVENUE

56'

M.H.

8"ø

4"ø PLASTIC

2"ø PLASTIC (4"ø CAST ENCASED)

SB-5

SB-4

<4.40

RW-1

SB-1

SB-3

SUSPECT FORMER UST

SIDEWALK

500

1,000

P-3

EB-1

MW-1

3,190

P-2

SB-2

P-1

MW-2

<0.500

FENCE/PROPERTY BOUNDARY

P-4

FORMER CANOPY

SB-6

EB-2

SIDEWALK

MW-3

<0.500

P-5

APARTMENT BUILDING

RESIDENTIAL

EB-3

FORMER STATION/GARAGE

P-6

P-7

P-8

RESIDENTIAL

1 1/4"ø PLASTIC

MW-4

<0.500

8"ø

NINTH STREET

MW-5

<0.500

MW-6

<0.500

36'

MOVIE THEATER (FORMER CHURCH)

EXPLANATION

MW-1	GROUNDWATER MONITORING WELL LOCATION
P-1	EXPLORATORY SOIL BORING/GRAB GROUNDWATER SAMPLE LOCATION, (1997)
EB-1	EXPLORATORY SOIL BORING/GRAB GROUNDWATER SAMPLE LOCATION, (1994)
SB-1	EXPLORATORY SOIL BORING LOCATION, (2007)
RW-1	RECOVERY WELL LOCATION
	UTILITY – PG&E (GAS)
	UTILITY – WATER
	UTILITY – STORM DRAIN
	UTILITY – SANITARY SEWER
M.H.	MANHOLE
<4.40	BENZENE CONCENTRATIONS IN GROUNDWATER IN MICROGRAMS PER LITER (ug/L)
500	BENZENE ISOCONCENTRATION CONTOUR (DASHED WHERE INFERRED)
<	NOT DETECTED AT OR ABOVE VALUE SHOWN

N

SCALE IN FEET

0 20

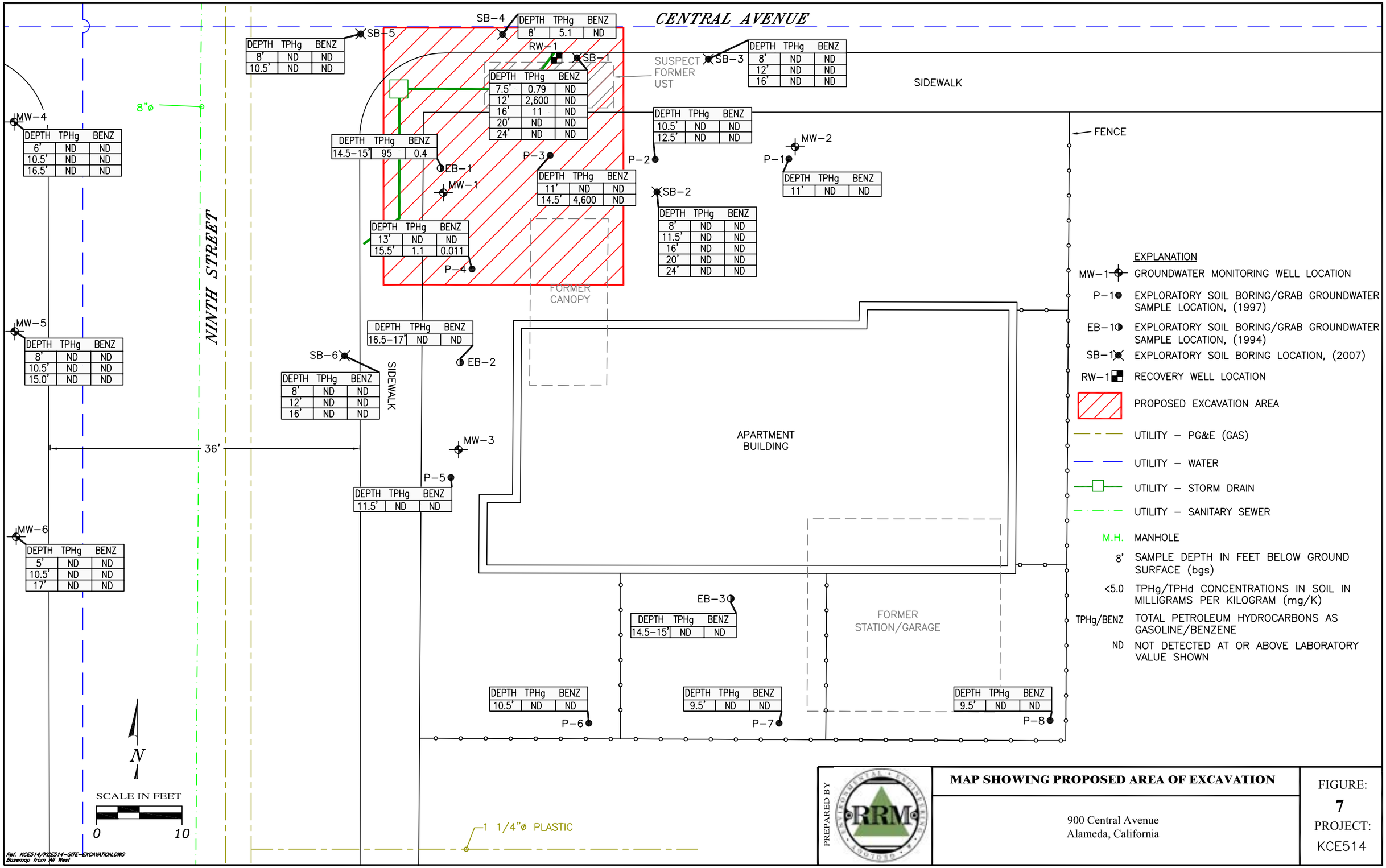
Ref. KCE514/KCE514-EXTENDED.DWG
Basemap from All West

PREPARED BY RRM

BENZENE GROUNDWATER ISOCONCENTRATION MAP, FEBRUARY 9, 2009

900 Central Avenue
Alameda, California

FIGURE:
6
PROJECT:
KCE514



PREPARED BY RRM ENVIRONMENTAL ENGINEERING

MAP SHOWING PROPOSED AREA OF EXCAVATION

900 Central Avenue
Alameda, California

FIGURE: **7**

PROJECT: KCE514

Ref. KCE514/KCE514-SITE-EXCAVATION.DWG
Basemap from All West

A

BORING LOGS

DRILL RIG: DA-1 SURFACE ELEVATION: -- LOGGED BY: BB

DEPTH TO GROUND WATER: 18.5 feet BORING DIAMETER: 4 inches DATE DRILLED: 4/20/94

DESCRIPTION AND REMARKS	SYMBOL	LEGEND	CONSISTENCY	SOIL TYPE	DEPTH (FEET)	SAMPLER	WATER CONTENT (%)	PENETRATION RESISTANCE (BLOWS/FT.)	SHEAR STRENGTH BY TORVANE (KSF)	ORGANIC VAPOR METER (ppm)
SILTY SAND, Brown, moist, fine to medium sand (fill)	Af		Loose	SM						
FILL										
SANDY SILT, yellow-brown, moist, fine to medium grained sand	B		Loose	SM	5					
Color change to green-gray, and petroleum odor between 10 and 20 feet					10					
Final										
Petroleum odor increases at 18 to 18.5 feet					15					
Saturated at approximately at 19 feet										
Initial					20					
Bottom of Boring = 20.0 feet.										
NOTE: The stratification lines represent the approximate boundary between the soil types. The transition may be gradual.					25					
					30					

1027-1, 5/12 BB*EB

EXPLORATORY BORING LOG - EB-1

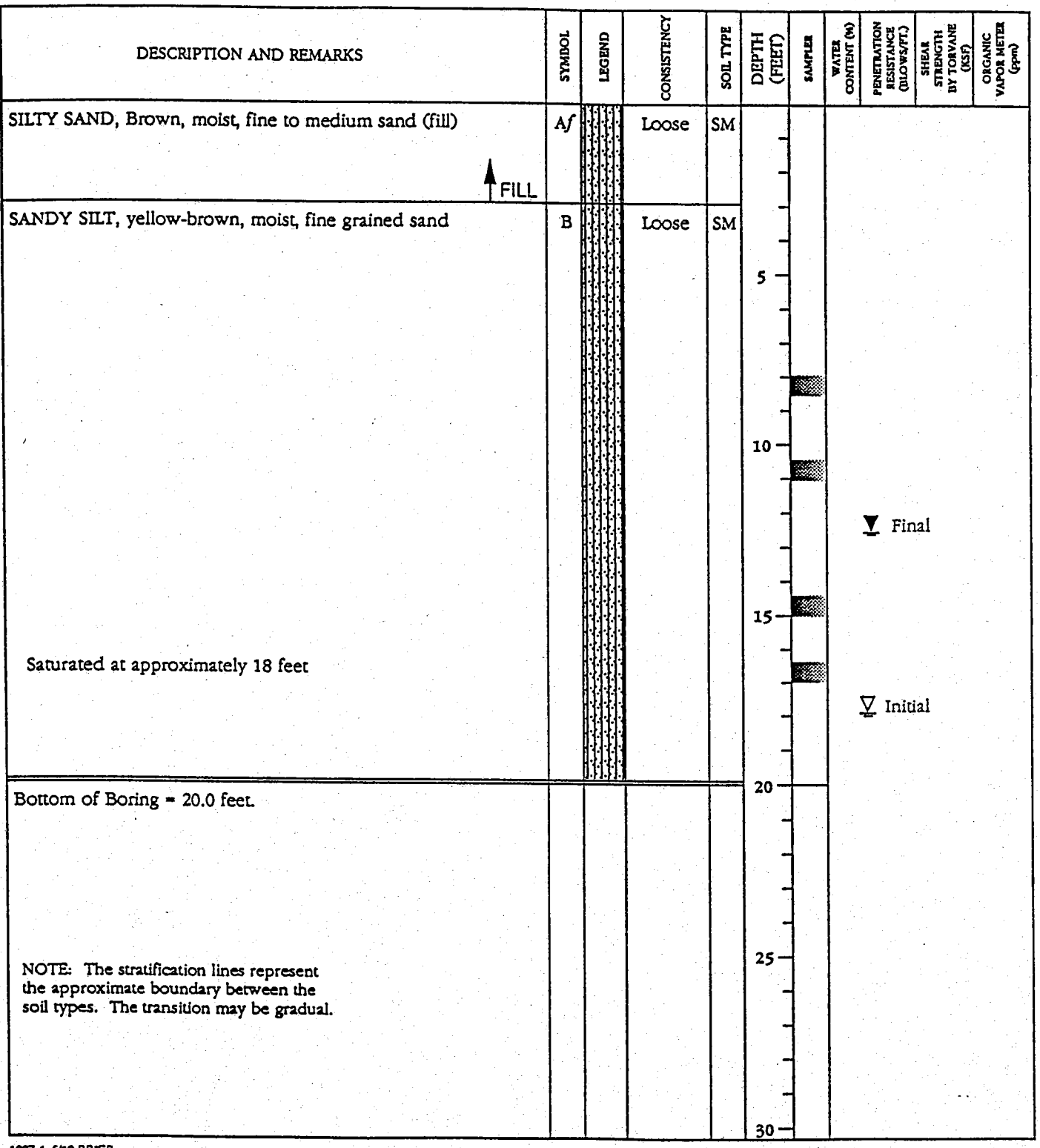
CENTRAL & 9TH STREET
Alameda, California

LOWNEY ASSOCIATES
Environmental/Geotechnical/Engineering Services

DRILL RIG: DA-1 SURFACE ELEVATION: -- LOGGED BY: BB

DEPTH TO GROUND WATER: 18 feet BORING DIAMETER: 4 inches DATE DRILLED: 4/20/94

DESCRIPTION AND REMARKS	SYMBOL	LEGEND	CONSISTENCY	SOIL TYPE
SILTY SAND, Brown, moist, fine to medium sand (fill) ↑FILL	Af		Loose	SM
SANDY SILT, yellow-brown, moist, fine grained sand	B		Loose	SM
Saturated at approximately 18 feet				
Bottom of Boring = 20.0 feet.				
NOTE: The stratification lines represent the approximate boundary between the soil types. The transition may be gradual.				



1027-1, 5/12 BB*EB

EXPLORATORY BORING LOG - EB-2

CENTRAL & 9TH STREET
Alameda, California

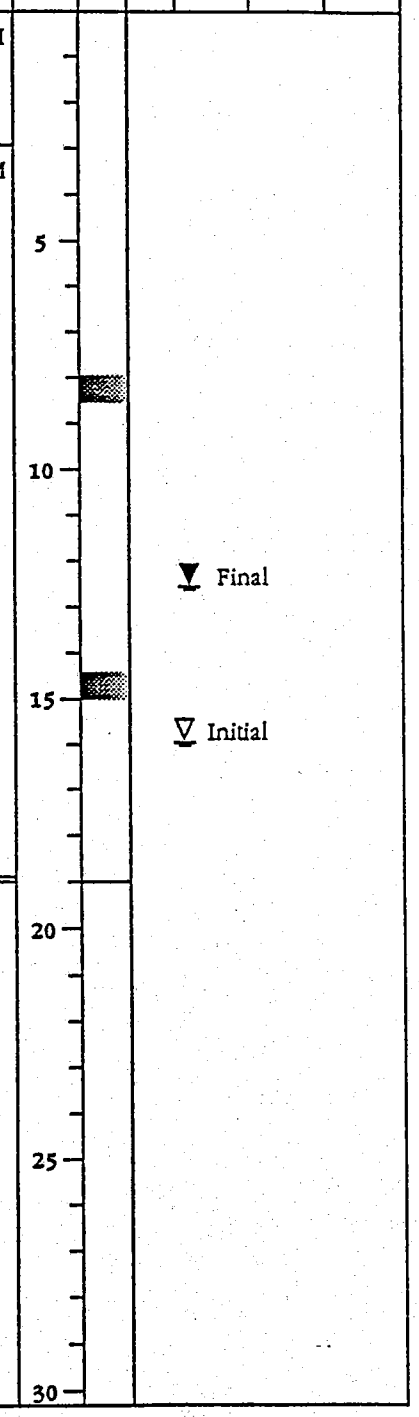
LOWNEY ASSOCIATES
Environmental/Geotechnical/Engineering Services

DRILL RIG: DA-1 SURFACE ELEVATION: -- LOGGED BY: BB

DEPTH TO GROUND WATER: 16 feet BORING DIAMETER: 4 inches DATE DRILLED: 4/20/94

DESCRIPTION AND REMARKS	SYMBOL	LEGEND	CONSISTENCY	SOIL TYPE
SILTY SAND, Brown, moist, fine to medium sand (fill) FILL	Af		Loose	SM
SANDY SILT, yellow-brown, moist, fine grained sand	B		Loose	SM
Saturated at approximately 16 feet				
Bottom of Boring = 19.0 feet.				

NOTE: The stratification lines represent the approximate boundary between the soil types. The transition may be gradual.



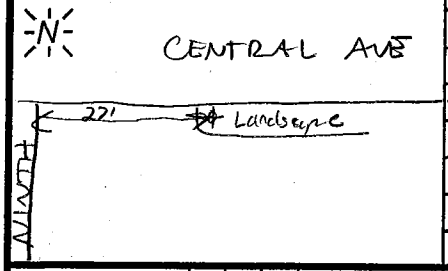
1027-1, 5/12 BB*EB

EXPLORATORY BORING LOG - EB-3

CENTRAL & 9TH STREET
Alameda, California

LOWNEY ASSOCIATES
Environmental/Geotechnical/Engineering Services

WELL/BORING LOCATION MAP

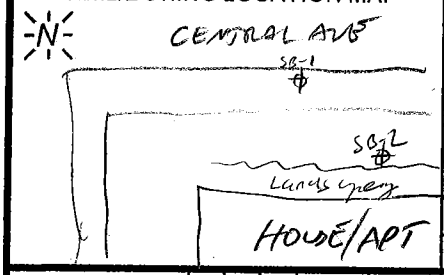


Remediation Risk Management, Inc.	WELL/BORING: SB-1
DATE: 8-9-07	DRILLING METHOD: Geoprobe
PROJECT: SCE514	SAMPLING METHOD: Hydraulic
CLIENT: Kelleher	BORING DIAMETER: 2"
LOCATION: 900 Central Ave	BORING DEPTH: 24'
CITY: Alameda	WELL CASING: N/A
CO./STATE: Alameda/CA	WELL SCREEN: N/A
DRILLER: Vironex	SAND PACK: N/A

WATER LEVEL:			
TIME:			
DATE:			
DESCRIPTION/LOGGED BY:	Cate Townsend		

WELL/BORING COMPLETION	FIRST ▽	STABILIZED ▼	MOISTURE	DENSITY BLOWS / FT	FIELD TEST PID (ppm)	SAMPLE NUMBER	DEPTH (FEET)	RECOVERY	SAMPLE INTERVAL	GRAPHIC	USCS SYMBOL	DESCRIPTION
CEMENT GROUT							1					≈6" topsoil
							2				SM	Silty Sand: Dark Brn; 7.5YR-4/4; 15% silt; 85% fine sand; loose; dry; roots; NPO
							3					
							4					
							5				SM	Silty Sand; Dark Brn - 7.5YR-4/4 10-15% silt; 85-90% fine sand; Color change @ 7.5' to Olive Gray 5Y-4/2 - NPO until ≈ 7.5' - SPO - appears to be stained
							6					
					1.1	SB-1 7.5 0850	7					color change
							8					
							9					
							10				SM	Silty Sand; Dark Greenish Gray; 5G-4/1 15% silt; 85% fine sand; very moist; SPO
					52.8	SB-1-12' 0900	11					
	▽						12					
							13				SP	Poorly Graded Sand; varies (mottled) from Dark Greenish Gray 5G-4/1 to Dark Brn - 7.5YR-4/4; 5% fine sand/silt; 95% medium sand; wet; SPO
							14					
							15					
					0.9	SB-1-16' 0924	16					
							17					
							18				SP	- Same as above; Color not varied) Dark Greenish Gray; 5G-4/1; wet
							19					
					0	SB-1-20' 0931	20					
							21				SP	Poorly Graded Sand; Dark Brn 7.5YR-4/4 5% silt/fine sand; 95% medium to coarse Sand; loose; wet; SPO - shoe of drill shavings NPO
							22					
					11.0	SB-1-24' 0940	24					BOTTOM OF BORING 24'

WELL/BORING LOCATION MAP



Remediation Risk Management, Inc. | WELL/BORING: SB-2

DATE: 8-9-07	DRILLING METHOD: Geoprobe
PROJECT: CCE514	SAMPLING METHOD: Hydraulic
CLIENT: Cellular	BORING DIAMETER: 2"
LOCATION: 900 Central Ave	BORING DEPTH: 26'
CITY: Alameda	WELL CASING: N/A
CO./STATE: Alameda / CA	WELL SCREEN: N/A
DRILLER: Nironex	SAND PACK: N/A

WATER LEVEL:			
TIME:			
DATE:			
DESCRIPTION/LOGGED BY: Cate Townsend			

WELL/BORING COMPLETION: CEMENT GROUT

DEPTH (FEET)	FIRST	STABILIZED	MOISTURE	DENSITY BLOWS / FT	FIELD TEST PID (ppm)	SAMPLE NUMBER	RECOVERY	SAMPLE INTERVAL	GRAPHIC	USCS SYMBOL	DESCRIPTION
1											
2											
3											
4											
5					0					SM	Silty Sand; Yellowish Red 5YR 4/6 10% silt, 90% sand; damp; NPO
6											
7											
8					0	SB-2-8' 1113					
9										SM	Silty Sand; Olive Brn; 2.5Y 4/3; 15% silt/fine sand; 85% Sand; Color change @ ≈ 10.5~11' to Dark Grenish Gray 5Y 4/1; damp; SPO @ 11'.
10											
11					0	SB-2 11.5' 1130					
12											
13											
14										SP	Poorly Graded Sand; Dark Grenish Gray; 5Y 4/1 5% silt/fine sand; 95% medium sand; moist; SPO
15											
16					0	SB-2 16' 1140					
17										SP	As above
18											Color change - to Olive Brn 2.5Y 4/3; SPO to ≈ 18.5'; NPO @ ≈ 19 to 20'
19											
20					0	SB-2 20' 1150					
21										SM	Silty Sand; Olive Brn 2.5Y 4/3 10% fines; 90% medium Sand damp; NPO
22											
23											
24					0	SB-2 24' 1205					

WELL/BORING LOCATION MAP

N

Remediation Risk Management, Inc. | WELL/BORING: SB-2

DATE:	DRILLING METHOD:
PROJECT:	SAMPLING METHOD:
CLIENT:	BORING DIAMETER:
LOCATION:	BORING DEPTH:
CITY:	WELL CASING:
CO./STATE:	WELL SCREEN:
DRILLER:	SAND PACK:

WELL/BORING COMPLETION	FIRST ▽	STABILIZED ▼	MOISTURE	DENSITY BLOWS / FT	FIELD TEST PID (ppm)	SAMPLE NUMBER	DEPTH (FEET)	RECOVERY	SAMPLE INTERVAL	GRAPHIC	USCS SYMBOL	WATER LEVEL:			
												TIME:			
												DATE:			
												DESCRIPTION/LOGGED BY:			
							25				SP	Well Graded Sand, same color & above			
							26					wet; NPO			
	▽														
	▽ BOTTOM OF BORING														
						26'									

WELL/BORING LOCATION MAP

N

SEE SITE MAP

Remediation Risk Management, Inc. | WELL/BORING: SB-3

DATE: 8-9-07	DRILLING METHOD: Geoprobe
PROJECT: KCB514	SAMPLING METHOD: Hydraulic
CLIENT: Kulchar	BORING DIAMETER: 2"
LOCATION: 900 Central Ave	BORING DEPTH: 16'
CITY: Alameda	WELL CASING: N/A
CO./STATE: Alameda / CA	WELL SCREEN: N/A
DRILLER: Vironex	SAND PACK: N/A

WATER LEVEL:			
TIME:			
DATE:			
DESCRIPTION/LOGGED BY:	CA Townsend		

WELL/BORING COMPLETION	FIRST ▽	STABILIZED ▼	MOISTURE	DENSITY BLOWS / FT	FIELD TEST PID (ppm)	SAMPLE NUMBER	DEPTH (FEET)	RECOVERY	SAMPLE INTERVAL	GRAPHIC	USCS SYMBOL	DESCRIPTION
Cement Grout							1					Sod/topsoil
							2					NA -
							3				SC	Clayey Sand; Dark Brn 7.5YR-4/4; 25-30% mpf; 75-70% fine sand; NPD
						SB-3 4.5' 1300	4					
					0		5				SM	Silty Sand; Dark Brn 7.5YR-4/4; 10-15% silt; 90% fine sand; loose; damp NPD
							6					
							7					
					0	SB-3 8' 1310	8					
							9				SP	Poorly Graded Sand; Dark Yellowish Brn 10YR-3/4; 5% fines; 95% fine to medium sand; damp; loose NPD
							10					
							11					
					0	SB-3 12' 1315	12					
	▽						13				SM	Silty Sand; Dark Yellowish Brn 10YR-4/4 10-15% fines/silt; 85-90% sand; wet; loose NPD
							14					
							15					
					0	SB-3 16' 1330	16					Bottom of Borg 16'

WELL/BORING LOCATION MAP

N

SEE SITE MAP

Remediation Risk Management, Inc. | WELL/BORING: SB-4

DATE: 8-9-07	DRILLING METHOD: Geoprobe
PROJECT: KCG514	SAMPLING METHOD: Hydraulic
CLIENT: Kellehe	BORING DIAMETER: 2"
LOCATION: 900 Central Ave	BORING DEPTH: 8'
CITY: Alameda	WELL CASING: N/A
CO./STATE: Alameda / CA	WELL SCREEN: N/A
DRILLER: Vironex	SAND PACK: N/A

WATER LEVEL:			
TIME:			
DATE:			
DESCRIPTION/LOGGED BY:	Cate Townsend		

WELL/BORING COMPLETION	FIRST ☑	STABILIZED ▼	MOISTURE	DENSITY BLOWS / FT	FIELD TEST PID (ppm)	SAMPLE NUMBER	DEPTH (FEET)	RECOVERY	SAMPLE INTERVAL	GRAPHIC	USCS SYMBOL	DESCRIPTION
← CEMENT GROUT →							1					
							2				SM	Silty Sand; Dark Yellowish Brn 10YR-3/4
							3					15% silt / fines; 85% sand; loose; damp; NPD
					0	SB-4 4' 1134S	4					
							5				SM	- Same as above;
							6					
							7				SM	- color change to Dark Greenish Gray 5/6 4/1 NPD until ≈ 7.5, SPD @ 7.5~8'
					4.4	SB-4 1400 8'	8					
↳ BOTTOM OF BORING												
					8'							

WELL/BORING LOCATION MAP

SEE SITE MAP

Remediation Risk Management, Inc. | WELL/BORING: SB-5

DATE: 8-9-07	DRILLING METHOD: Geoprobe
PROJECT: KC6514	SAMPLING METHOD:
CLIENT: Kaiser	BORING DIAMETER: 2"
LOCATION: 900 Central Ave	BORING DEPTH: 12'
CITY: Alameda	WELL CASING: N/A
CO./STATE: Alameda / CA	WELL SCREEN: N/A
DRILLER: Vironex	SAND PACK: N/A

WATER LEVEL:			
TIME:			
DATE:			

DESCRIPTION/LOGGED BY: C Townsend

WELL/BORING COMPLETION	FIRST ▽	STABILIZED ▼	MOISTURE	DENSITY BLOWS / FT	FIELD TEST PID (ppm)	SAMPLE NUMBER	DEPTH (FEET)	RECOVERY	SAMPLE INTERVAL	GRAPHIC	USCS SYMBOL	
							1					6" asphalt
							2					
							3				SM	Silty Sand; Dark Yellowish Brn; 10YR-3/4 10-15% silt fines; 85-90% fine sand; loose; dry; NPO
						SB-5-4'						
					0	1500	4					
							5					
							6				SM	Same as above; iron-oxide staining clumps; NPO
							7					
					0	SB-5-8'	8					
						1510	9					
							10				SM	As above; Sharp color change @ 9.5' from Dark Yellowish Brn 10YR-3/4 to Dark Greenish Gray; 5BG-4/1 SPO @ ≈ 9.5-10
						SB-5						
					0	10.5	11					
						1520						
							12					
Cement Grout												
Bottom of Boring @ 12'												

WELL/BORING LOCATION MAP

N

SEE SITE MAP

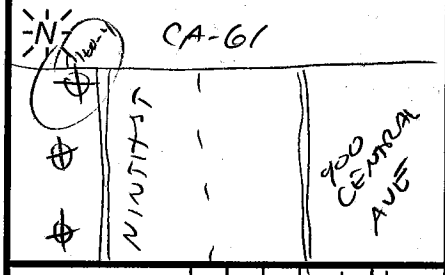
Remediation Risk Management, Inc. | WELL/BORING: SB-6

DATE: 8-9-07	DRILLING METHOD: Geoprobe
PROJECT: KCE514	SAMPLING METHOD:
CLIENT: Kelleher	BORING DIAMETER: 2"
LOCATION: 900 Central Ave	BORING DEPTH: 16'
CITY: Alameda	WELL CASING: N/A
CO./STATE: Alameda / CA	WELL SCREEN: N/A
DRILLER: Vironex	SAND PACK: N/A

WATER LEVEL:			
TIME:			
DATE:			
DESCRIPTION/LOGGED BY: Cade Townsend			

WELL/BORING COMPLETION	FIRST ▽	STABILIZED ▼	MOISTURE	DENSITY BLOWS / FT	FIELD TEST PID (ppm)	SAMPLE NUMBER	DEPTH (FEET)	RECOVERY	SAMPLE INTERVAL	GRAPHIC	USCS SYMBOL	DESCRIPTION
CEMENT GROUT							1					≈ 6" asphalt
							2				SM	Silty Sand; Dark Yellowish Brn - 10YR-4/4 15% silt/fines; 85% fine sand; loose; iron oxide staining; NPO
							3					
					0	SB-6 41 1540	4					
							5					
							6				SM	Silty Sand - Dark Yellowish Brn - 10YR-4/6 Sand as above; NPO
							7					
					0	SB-6 8' 1548	8					
							9					Same as above
							10				SM	
							11					
					0	SB-6 12' 1600	12					
	▽						13				SP	As above - color 5% fines; 95% Sand; dry moist NPO;
							14					
							15					
					0	SB-6 16' 1610	16					
BOTTOM OF BORING 16'												

WELL/BORING LOCATION MAP



Remediation Risk Management, Inc. | WELL/BORING: MW-4

DATE: 6-20-07	DRILLING METHOD: HSA
PROJECT: K655/4	SAMPLING METHOD: SS
CLIENT: Kaiser	BORING DIAMETER: 8"
LOCATION: 900 Central Ave	BORING DEPTH: 18'
CITY: Alameda	WELL CASING: 2" PVC
CO./STATE: Alameda / CA	WELL SCREEN: 18-8' 0.020
DRILLER: Explor. Geoserv.	SAND PACK: 18-6' #3

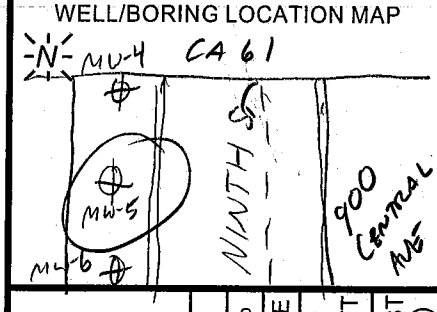
WATER LEVEL:	11.5	10.43
TIME:	1300	1412
DATE:	6-20-07	6-20-07

DESCRIPTION/LOGGED BY: Cate Townsend

WELL/BORING COMPLETION	FIRST	STABILIZED	MOISTURE	DENSITY BLOWS / FT	FIELD TEST PID (ppm)	SAMPLE NUMBER	DEPTH (FEET)	RECOVERY	SAMPLE INTERVAL	GRAPHIC	USCS SYMBOL	
Cement Grout / Bentonite Grout							1					4" concrete
			D				2				ML	Silt w/ Sand, 7.5YR - 4/4 - Dark Brown; 15% very fine sand; 85% silt; occasional clast/pebble (sub-rounded) roots; dry loose; NPO
							3					
							4					
			D	5,7,11	1.0	MW-4 4.5 1215	5				ML	Sandy Silt; 10 YR - 4/6 - Dark Yellowish Brn 30-40% silt; 60-70% fine sand; Dry; loose; iron oxide staining; NPO
			D	10,8,14	0.0	MW-4 1226 6'	6					Same as above - color - 10YR 4/4 Dark Yellowish Brown
							7					
			DP	12,20,24	0.1	MW-4 7.5' 1237	8				SM	Silty Sand - 10YR - 4/4 Dark Yellowish Brn; 30% silt; 70% fine to medium sand; damp; NPO
			DP	8,12,15	0.0	MW-4' 12 48 9.5'	9				SM	Same as above
							10					
			M	14,20,21	0.5	MW-4 1300 10.5'	11				SM	Same as above - Moist
			W	20,21,23	0.0	MW-4 12 1315	12				SM	Silty Sand - 7.5YR - 4/3 - Strong Brown 15% silt / fine sand; 85% medium sand Wet; NPO
				18,21,22			13					
							14					NO RECOVERY
			W	8,13,20	0.0	MW-4 15' 1327	15				SM	Same as above (11.5 - 13')
							16					
			W	12,15,20	0.1	MW-4 16.5 1349	17				SP	Poorly Graded Sand, 10 YR-4/4 - Dark Yellowish Brown; 5% silt / sand; 95% medium sand Wet; NPO
							18					
							19					
							20					

→ BOTTOM OF BORING 18'

WELL/BORING LOCATION MAP



Remediation Risk Management, Inc. | WELL/BORING: MW-5

DATE: 6-20-07	DRILLING METHOD: HSA
PROJECT: KCE514	SAMPLING METHOD: SS
CLIENT: Kelleher	BORING DIAMETER: 8"
LOCATION: 900 Central Ave	BORING DEPTH: 18'
CITY: Alameda	WELL CASING: 2" PVC
CO./STATE: Alameda / CA	WELL SCREEN: 18-8 .020
DRILLER: Exp. Geoserv	SAND PACK: 18-6 #3

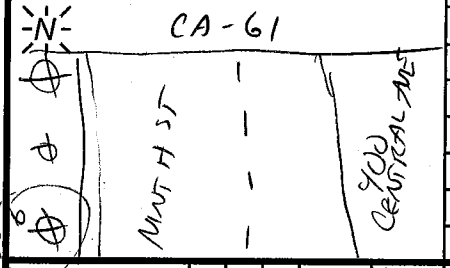
WATER LEVEL:	10.5	11.1
TIME:	1030	1100
DATE:	6-20-07	6-20-07

DESCRIPTION/LOGGED BY: Cate Townsend

WELL/BORING COMPLETION	FIRST	STABILIZED	MOISTURE	DENSITY BLOWS / FT	FIELD TEST PID (ppm)	SAMPLE NUMBER	DEPTH (FEET)	RECOVERY	SAMPLE INTERVAL	GRAPHIC	USCS SYMBOL	DESCRIPTION
Vaughn Concrete							0					4" Concrete
Cement Grout			D				1				ML	Sandy Silt; 10YR 3/4 Dark Yellowish Brn 30% fine sand; 70% silt; roots; loose. dry; NPO
							2					
							3				SM	Silty Sand; 10 YR 5/4 Yellowish Brn; 15% silt / fine sand; 85% sand; dry; loose NPO
							4					
			D	4,4,10	3.6	MW-5-4.5 0920	5				SP	Poorly Graded Sand 10 YR 5/4 Yellowish Brown; 5% mot; 10% fine sand; 85% med sand; loose; dry; NPO
			D	6,17,50	0	NO SAMP	6				SP	Poorly Graded Sand; Same color as above dry; silty; 10% mpl; 85% sand; damp; no odor; some iron oxide staining; NPO
			DP	12,21,25	0	MW-5-7.5 0945	7 8				SM	Silty Sand; 10YR - 4/4 Dark Yellowish Brown; 30% silt / fine sand; 70% sand; damp; roots; loose; NPO
			DP	10,18,26	1.8	NO SAMP	9				SM	Same as above; numerous roots
			W				10					
				10,15,23	1.9	MW-5-10.5 1038	11				SM	Same as above - 10YR - 4/3 Dark Brown; Wet; roots; NPO
			W	13,14,20	0	MW-5-12 1040	12				SP	Poorly Graded Sand; 10YR - 4/4 Dark Yellowish Brown; 5% fine sand / silt; 15% medium sand; WET; NPO
							13					
			W	10,12,18	3.5	MW-5-13.5 1109	14				SP	Same as above
			W	11,22,18	2.7	MW-5-16 1125	15 16				SP	Same as above
			(W)	10,18,16			17					NO RECOVERY
							18					
							19					
							20					

BOTTOM OF BORING 18'

WELL/BORING LOCATION MAP



Remediation Risk Management, Inc.		WELL/BORING: MW-6
DATE: 6-20-07	DRILLING METHOD:	HSA
PROJECT: KCB574	SAMPLING METHOD:	SS
CLIENT: Kelleher	BORING DIAMETER:	8"
LOCATION: 900 Central Ave	BORING DEPTH:	18'
CITY: Alameda	WELL CASING:	2" PVC
CO./STATE: Alameda / CA	WELL SCREEN:	18-8', 0.020
DRILLER: Expl. Geosv.	SAND PACK:	18-6' #3

WATER LEVEL:	≈10.5	9.36	
TIME:	1525	1622	
DATE:	6-20-07	6-20-07	
DESCRIPTION/LOGGED BY:	Cate Townsend		

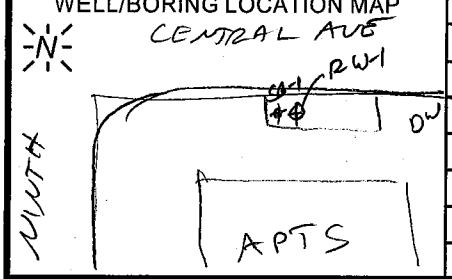
WELL/BORING COMPLETION	FIRST ▽	STABILIZED ▼	MOISTURE	DENSITY BLOWS / FT	FIELD TEST PID (ppm)	SAMPLE NUMBER	DEPTH (FEET)	RECOVERY	SAMPLE INTERVAL	GRAPHIC	USCS SYMBOL	DESCRIPTION
Cement Grout							0					4" Concrete
Cement Grout							1				ML	Silt w/ Sand; 15-20% very fine sand; 85-80-1 Silt; dry; loose; roots; NPD
							2					
							3					
							4					
			DP	5,7,10	0.0	MW-6 5' 1610	5				SM	Silty Sand 10YR-4/4 Dark Yellowish Brn; 20-30% silt; 70-80% very fine sand; loose; damp; roots; NPD
							6					
							7					
							8					
							9					
	▽		W				10				SM	Silty Sand; 10YR-3/4 Dark Yellowish Brn 20% silt; 80% fine rounded sand; wet; NPD
			W	10,18,26	0.0	MW-6-10.5' 1612	11					
							12					
							13					
							14					
							15				SM	Same as above
			W	18,26,25	0.0	MW-6-15' 1630	16				SM	Same as above
			W	17,28,28	0.0	MW-6-17' 1650	17					
							18					
							19					
							20					

BOTTOM OF BORING @ 18'

SEND DWR TO

AC
PW
Alth
MH

WELL/BORING LOCATION MAP



Remediation Risk Management, Inc.		WELL/BORING: RW-1
DATE: 8/3-07	DRILLING METHOD:	HSA
PROJECT: KC6514	SAMPLING METHOD:	SS
CLIENT: Kelleher	BORING DIAMETER:	12"
LOCATION: 900 Central Ave	BORING DEPTH:	20'
CITY: Alameda	WELL CASING:	4"
CO./STATE: Alameda / CA	WELL SCREEN:	0.020
DRILLER: Expl. Geo	SAND PACK:	#3 Sand

WATER LEVEL:	1138		
TIME:	1033		
DATE:	8-13-07		
DESCRIPTION/LOGGED BY:	C Townsend		

WELL/BORING COMPLETION	FIRST	STABILIZED	MOISTURE	DENSITY BLOWS / FT	FIELD TEST PID (ppm)	SAMPLE NUMBER	DEPTH (FEET)	RECOVERY	SAMPLE INTERVAL	GRAPHIC	USCS SYMBOL	DESCRIPTION
Cement Grout							1					
Cement Grout							2					See log for SB-1
							3					Note ≈ 10' change in color from dark BRN to green grey; sand; silty sand
							4					
						RW-1: 5' 0833	5					
							6					
							7					
							8					
							9					
					748	RW1-10' 0840	10					
							11					
							12					
							13					
							14					
					200	BW-1 15' 0850	15					
							16					
							17					
							18					
							19					
					938	BW-1 20' 0904	20					

Cont-1 0930

AllWest
AllWest Environmental, Inc.

Log of Boring: MW-1

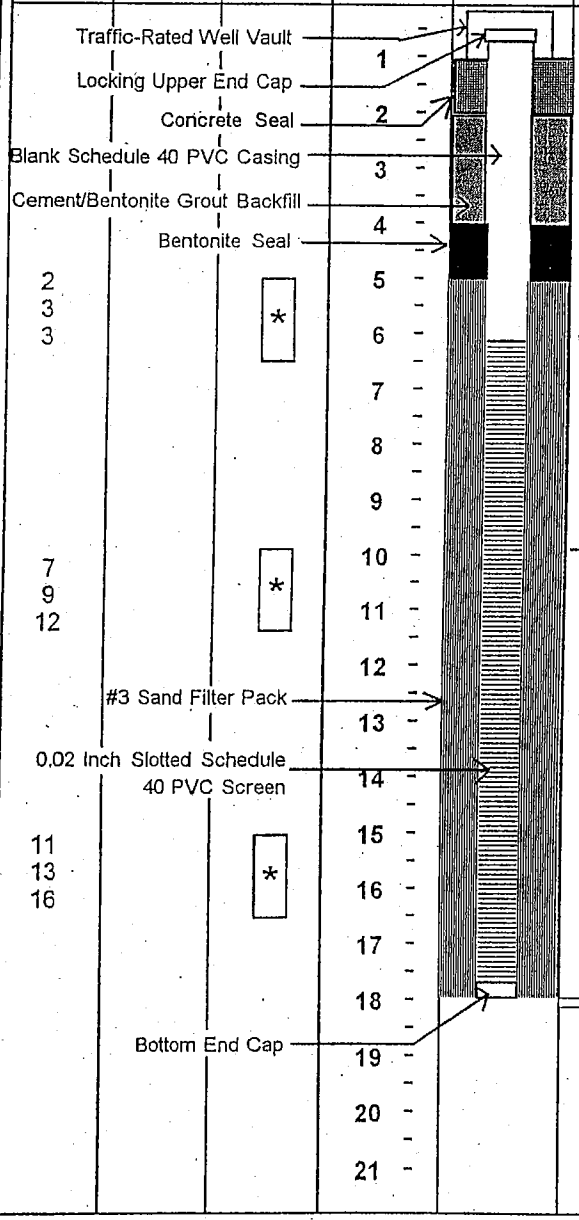
Sheet 1 of 1

Project Address: 900 Central Avenue, Alameda, CA

Project Number: 98115.23

Drilling Date: 11/16/98

Drilling Contractor: Bay Area Exploration
Drill Rig: CME 75
Auger: 8" Diameter Hollow-Stem
Sampler: SPT sampler
Hammer: 140 lbs, 30" drop
Logged By: L. Ching



Blow Count	OVM Reading	Sample Interval	Depth in Feet	Well Profile	USCS Code	Soil Description
					SM	Grassy ground surface, landscaped area; Brown, silty fine to very fine SAND, loose, moist, non-plastic;
2 3 3		*	5 6		SM	Brown to dark brown, silty fine SAND, medium dense, non-plastic, moist to very moist;
7 9 12		*	10 11 12		SM	Olive brown to green brown, silty fine SAND, medium dense, non-plastic, very moist to wet, hydrocarbon odor;
			13 14			groundwater first encountered at 14';
11 13 16		*	15 16 17 18			boring terminated at 18';
			19 20 21			

Notes: * Sample not preserved

Reviewed By: R. Horwath

Drawn By: S. Poon

AllWest
AllWest Environmental, Inc.

Log of Boring: MW-2

Sheet 1 of 1

Project Address: 900 Central Avenue, Alameda, CA

Project Number: 98115.23

Drilling Date: 11/16/98

Drilling Contractor: Bay Area Exploration
Drill Rig: CME 75
Auger: 8" Diameter Hollow-Stem

Sampler: SPT sampler
Hammer: 140 lbs, 30" drop
Logged By: L. Ching

Blow Count	OVM Reading	Sample Interval	Depth in Feet	Well Profile	USCS Code	Soil Description
			1	Traffic-Rated Well Vault; Locking Upper End Cap	SM	Grassy ground surface, landscaped area; Brown, silty fine to very fine SAND, loose, moist, non-plastic;
			2	Concrete Seal		
			3	Blank Schedule 40 PVC Casing		
			4	Cement/Bentonite Grout Backfill; Bentonite Seal		
2 3 4		*	5			
			6			
			7			
			8		SM	Brown to dark brown, silty fine SAND, medium dense, non-plastic, moist to wet;
			9			
7 9 10		*	10			
			11			
			12	#3 Sand Filter Pack		
			13			
			14			groundwater first encountered at 14';
			15			
11 14 17		*	16			Brown to yellow brown, silty fine SAND, medium dense to dense, non-plastic, wet;
			17	0.02 Inch Slotted Schedule 40 PVC Screen	SM	
			18			
			19	Bottom End Cap		
13 15 18		*	20			boring terminated at 21';
			21			

Notes: * Sample not preserved

Reviewed By: R. Horwath

Drawn By: S. Poon

AllWest
AllWest Environmental, Inc.

Log of Boring: MW-3

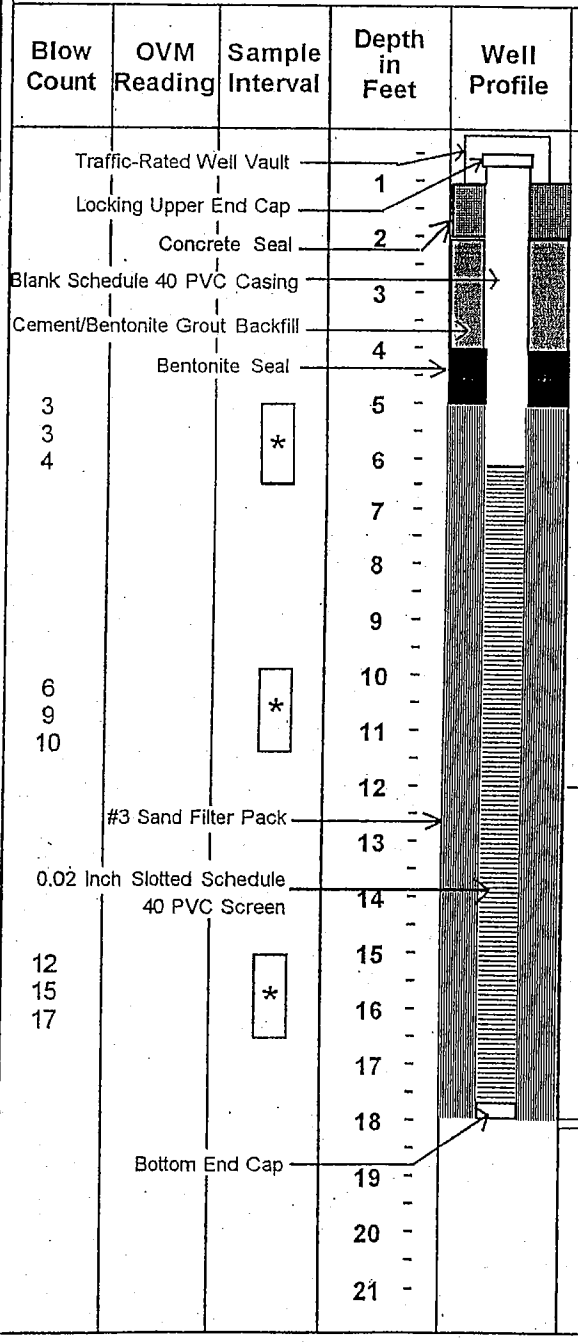
Sheet 1 of 1

Project Address: 900 Central Avenue, Alameda, CA

Project Number: 98115.23

Drilling Date: 11/16/98

Drilling Contractor: Bay Area Exploration
Drill Rig: CME 75
Auger: 8" Diameter Hollow-Stem
Sampler: SPT sampler
Hammer: 140 lbs, 30" drop
Logged By: L. Ching



Blow Count	OVM Reading	Sample Interval	Depth in Feet	Well Profile	USCS Code	Soil Description
					SM	Grassy ground surface, landscaped area; Brown, silty fine to very fine SAND, loose, moist, non-plastic;
3 3 4		*				
					SM	Brown to dark brown, silty fine SAND, medium dense, non-plastic, moist to very moist;
6 9 10		*				
					SM	Brown to yellow brown, silty fine SAND, medium dense to dense non- plastic, very moist to wet; groundwater first encountered at 14';
12 15 17		*				boring terminated at 18';

Notes: * Sample not preserved

Reviewed By: R. Horwath

Drawn By: S. Poon

AllWest
AllWest Environmental, Inc.

Log of Boring: P - 1

Project Address: 900 Central Avenue, Alameda, CA

Project Number: 97217.23

Drilling Date: 6/30/97

Drilling Contractor: ECA
Drill Rig: Geoprobe
Auger: N/A

Sampler: 2" x 4' macro core
Hammer: pneumatic hammer
Logged By: Long Ching

OVM Reading	Sample Number	Sample Interval	Depth in Feet	Well Profile	USCS Code	Soil Description
			1		SM/SP	Grassy ground surface (lawn); Brown, silty sand, fine grain, poorly graded, slightly moist, loose, non-plastic;
ND	P-1-3		3			
			4			Brown, silty sand, fine to medium grain, moist, loose to medium dense, non-plastic;
			5			
			6			
ND	P-1-7		7			
			8		SM	
			9			
			10			Grades very moist to wet below 10';
ND	P-1-11		11			
			12			Groundwater encountered at 12';
			13			
ND	P-1-14		14			
			15			Borehole terminated at 14'; Groundwater first encountered at 12'; Temporary 1" I.D. PVC casing installed to 14'; 2 x 40-ml and 1 x 1-liter groundwater samples collected.
			16			
			17			
			18			
			19			
			20			
			21			

Notes:

Reviewed By: L. Ching

Drawn By: S. Poon

AllWest
AllWest Environmental, Inc.

Log of Boring: P - 2

Project Address: 900 Central Avenue, Alameda, CA

Project Number: 97217.23

Drilling Date: 6/30/97

Drilling Contractor: ECA
Drill Rig: Geoprobe
Auger: N/A

Sampler: 2" x 4' macro core
Hammer: pneumatic hammer
Logged By: Long Ching

OVM Reading	Sample Number	Sample Interval	Depth in Feet	Well Profile	USCS Code	Soil Description
			1		SM/SP	Grassy ground surface (lawn); Brown, silty sand, fine grain, poorly graded, slightly moist, loose, non-plastic;
ND	P-2-3.5		3		SM	Brown, silty sand, fine to medium grain, moist, loose to medium dense, non-plastic;
ND	P-2-7.5		7			
			10			Grades very moist below 10';
ND	P-2-10.5		11			
10	P-2-12.5		12			Grades greenish brown, slight hydrocarbon odor at 12'; Groundwater encountered at ~~12'.5;~~
			14			Borehole terminated at 14'; Groundwater first encountered at 12.5'; Temporary 1" I.D. PVC casing installed to 14'; 2 x 40-ml and 1 x 1-liter groundwater samples collected.
			15			
			16			
			17			
			18			
			19			
			20			
			21			

Notes:

Reviewed By: L. Ching

Drawn By: S. Poon

AllWest
AllWest Environmental, Inc.

Log of Boring: P - 3
Project Address: 900 Central Avenue, Alameda, CA
Project Number: 97217.23
Drilling Date: 6/30/97

Drilling Contractor: ECA
Drill Rig: Geoprobe
Auger: N/A

Sampler: 2" x 4' macro core
Hammer: pneumatic hammer
Logged By: Long Ching

OVM Reading	Sample Number	Sample Interval	Depth in Feet	Well Profile	USCS Code	Soil Description
			1		SM/SP	Grassy ground surface (lawn); Brown, silty sand, fine grain, poorly graded, slightly moist, loose, non-plastic;
ND	P-3-3.5		2 3 4			
			5 6		SM/SP	Brown, silty sand, fine with some medium grain, moist, loose to medium dense, non-plastic;
ND	P-3-7.5		7 8 9			Grades oliver brown below 7.5'
10	P-3-11		10 11 12			Grades very moist to wet below 11', with hydrocarbon odor; Groundwater encountered at 12'.5;
15	P-3-14.5		13 14 15			
			16 17 18 19 20 21			Borehole terminated at 15'; Groundwater first encountered at 12'; Temporary 1" I.D. PVC casing installed to 15'; 2 x 40-ml and 1 x 1-liter groundwater samples collected.

Notes:

Reviewed By: L. Ching
Drawn By: S. Poon

AllWest
AllWest Environmental, Inc.

Log of Boring: P - 4
Project Address: 900 Central Avenue, Alameda, CA
Project Number: 97217.23
Drilling Date: 6/30/97

Drilling Contractor: ECA
Drill Rig: Geoprobe
Auger: N/A

Sampler: 2" x 4' macro core
Hammer: pneumatic hammer
Logged By: Long Ching

OVM Reading	Sample Number	Sample Interval	Depth in Feet	Well Profile	USCS Code	Soil Description
			1		SM/SP	Grassy ground surface (lawn); Brown, silty sand, fine grain, poorly graded, slightly moist, loose, non-plastic;
			2			
			3			
ND	P-4-3.5		4			
			5		SM	Brown, silty sand, fine with some medium grain, moist, loose to medium dense, non-plastic;
			6			
			7			
ND	P-4-7.5		8			
			9			
			10			
ND	P-4-10.5		11			
			12			Grades oliver brown to greenish brown ~~below 12'~~ Groundwater encountered at 12'.5 to 13', with hydrocarbon odor;
10	P-4-13		13			
			14			
			15			
20	P-4-15.5		16			
			17			Borehole terminated at 16'; Groundwater first encountered at 13'; Temporary 1" I.D. PVC casing installed to 16'; 2 x 40-ml and 1 x 1-liter groundwater samples collected.
			18			
			19			
			20			
			21			

Notes:

Reviewed By: L. Ching
Drawn By: S. Poon

AllWest
AllWest Environmental, Inc.

Log of Boring: P - 5
Project Address: 900 Central Avenue, Alameda, CA
Project Number: 97217.23
Drilling Date: 6/30/97

Drilling Contractor: ECA
Drill Rig: Geoprobe
Auger: N/A

Sampler: 2" x 4' macro core
Hammer: pneumatic hammer
Logged By: Long Ching

OVM Reading	Sample Number	Sample Interval	Depth in Feet	Well Profile	USCS Code	Soil Description
			1		SM/SP	Grassy ground surface (lawn); Brown, silty sand, fine grain, poorly graded, slightly moist, loose, non-plastic;
ND	P-5-3.5		4			
			5		SM	Brown, silty sand, fine with some medium grain, moist, loose to medium dense, non-plastic;
ND	P-5-7.5		8			
			11			Groundwater encountered at 11'.5;
ND	P-5-11.5		12			
			15			
ND	P-5-15.5		16			
			17			Borehole terminated at 16'; Groundwater first encountered at 11.5'; Temporary 1" I.D. PVC casing installed to 16'; 2 x 40-ml and 1 x 1-liter groundwater samples collected.
			18			
			19			
			20			
			21			

Notes:

Reviewed By: L. Ching
Drawn By: S. Poon

AllWest
AllWest Environmental, Inc.

Log of Boring: P - 6
Project Address: 900 Central Avenue, Alameda, CA
Project Number: 97217.23
Drilling Date: 6/30/97

Drilling Contractor: ECA
Drill Rig: Geoprobe
Auger: N/A

Sampler: 2" x 4' macro core
Hammer: pneumatic hammer
Logged By: Long Ching

OVM Reading	Sample Number	Sample Interval	Depth in Feet	Well Profile	USCS Code	Soil Description
			1		SW	Concrete ground surface (driveway); Dark brown, gravelly sand, medium to coarse grain, slightly moist, medium dense, non-plastic;
			2		SM/SP	Brown, silty sand, fine grain, slightly moist, loose, non-plastic;
			3			
ND	P-6-3.5		4			
			5			Brown, silty sand, fine with some medium grain, moist, loose to medium dense, non-plastic;
			6			
			7			
ND	P-6-7.5		8			
			9		SM	
			10			
ND	P-6-10.5		11			Groundwater encountered at 11'.5;
			12			
			13			
ND	P-6-13.5		14			Borehole terminated at 14'; Groundwater first encountered at 11.5'; Temporary 1" I.D. PVC casing installed to 14'; 2 x 40-ml and 1 x 1-liter groundwater samples collected.
			15			
			16			
			17			
			18			
			19			
			20			
			21			

Notes:

Reviewed By: L. Ching
Drawn By: S. Poon

AllWest
AllWest Environmental, Inc.

Log of Boring: P - 7
Project Address: 900 Central Avenue, Alameda, CA
Project Number: 97217.23
Drilling Date: 6/30/97

Drilling Contractor: ECA
Drill Rig: Geoprobe
Auger: N/A

Sampler: 1" x 2' geoprobe
Hammer: pneumatic hammer
Logged By: Long Ching

OVM Reading	Sample Number	Sample Interval	Depth in Feet	Well Profile	USCS Code	Soil Description
			1			Grassy ground surface (lawn); Brown, silty sand, fine grain, poorly graded, slightly moist, loose, non-plastic;
			2			
			3			
			4			
ND	P-7-4.5		5			
			6			
			7		SM/SP	
			8			Grades moist below 8';
			9			
ND	P-7-9.5		10			
			11			
			12			Groundwater encountered at 12;
			13			
ND	P-7-13.5		14			
			15			Borehole terminated at 14'; Groundwater first encountered at 12'; Temporary 1" I.D. steel casing installed to 14', very slow recharge; 2 x 40-ml groundwater samples collected.
			16			
			17			
			18			
			19			
			20			
			21			

Notes:

Reviewed By: L. Ching
Drawn By: S. Poon

AllWest
AllWest Environmental, Inc.

Log of Boring: P - 8
Project Address: 900 Central Avenue, Alameda, CA
Project Number: 97217.23
Drilling Date: 6/30/97

Drilling Contractor: ECA
Drill Rig: Geoprobe
Auger: N/A

Sampler: 1" x 2' geoprobe
Hammer: pneumatic hammer
Logged By: Long Ching

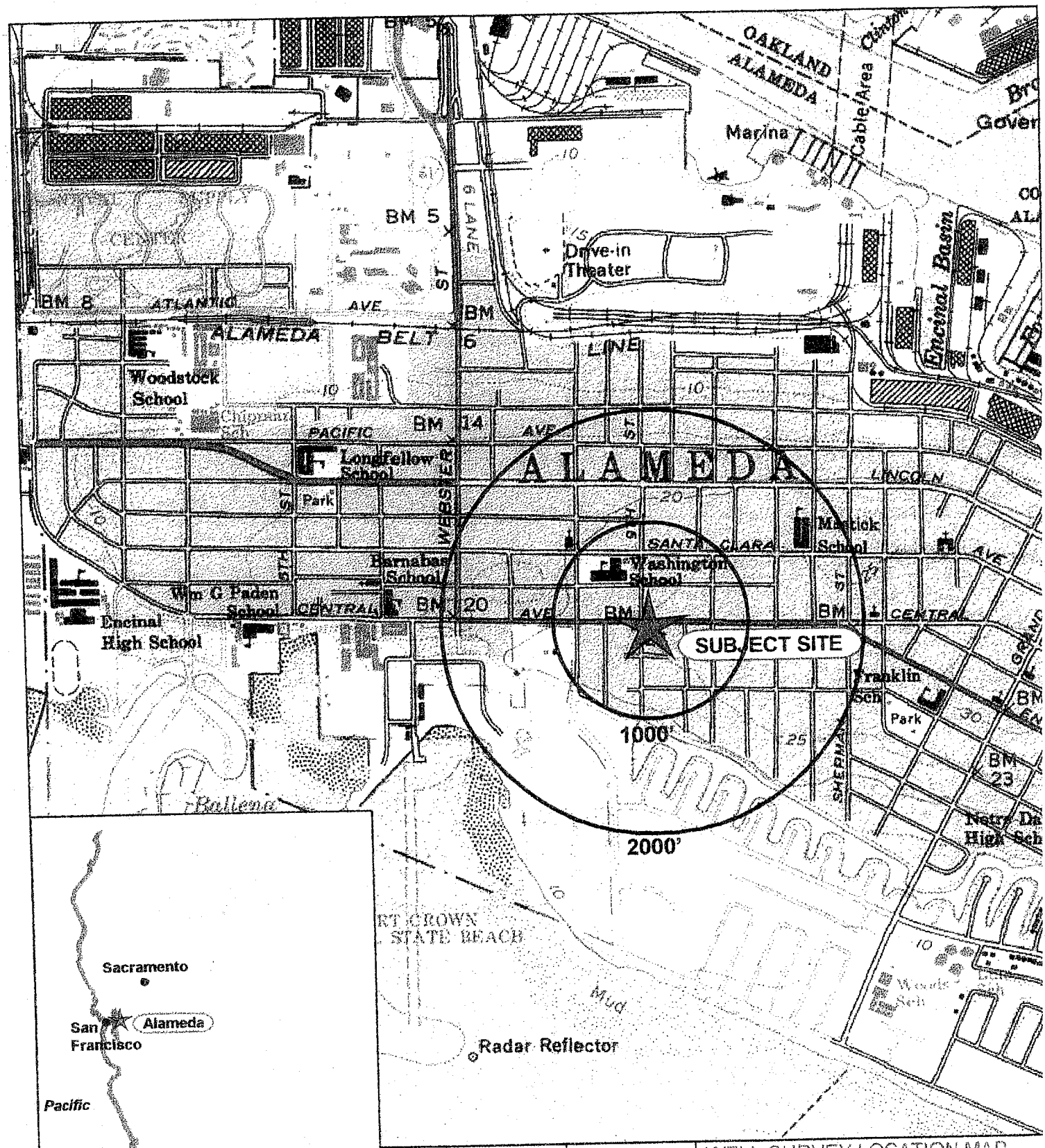
OVM Reading	Sample Number	Sample Interval	Depth in Feet	Well Profile	USCS Code	Soil Description
			1		SM/SP	Grassy ground surface (lawn); Brown, silty sand, fine grain, poorly graded, slightly moist, loose, non-plastic;
			2			
			3			
ND	P-8-4		4			Brown, silty sand, fine to medium grain, moist, medium dense, non-plastic;
			5			
			6			
			7			
			8			
			9		SM	Grades moist below 8';
ND	P-8-9.5		10			
			11			
			12			Groundwater encountered at 12;
			13			
ND	P-8-14		14			
			15			Borehole terminated at 15'; Groundwater first encountered at 12'; Temporary 1" I.D. steel casing installed to 15', slow recharge; 2 x 40-ml and 1 x 1-liter groundwater samples collected.
			16			
			17			
			18			
			19			
			20			
			21			

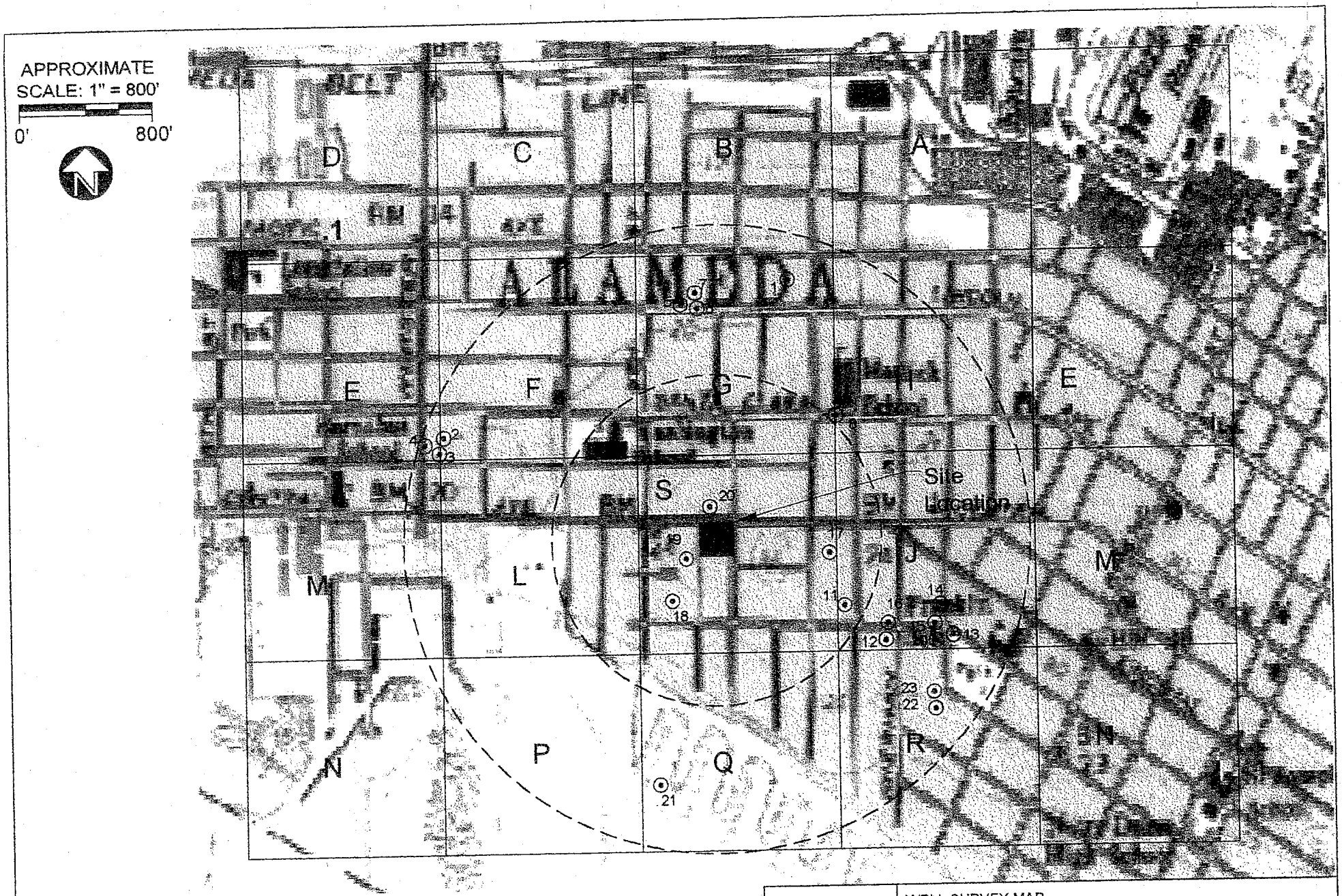
Notes:

Reviewed By: L. Ching
Drawn By: S. Poon

B

WELL SURVEY INFORMATION


OAKLAND
ALAMEDA
Marina
Drive-in Theater
Encinal Basin
BM 5
BM 8
ATLANTIC AVE
ALAMEDA BELT LINE
Woodstock School
PACIFIC AVE
Long Fellow School
Park
ALAMEDA
LINCOLN
SANTA CLARA
Mastick School
Washington School
Barnabas School
Wm G Paden School
CENTRAL
Encinal High School
SUBJECT SITE
Franklin Sch
1000'
2000'
Radar Reflector
Mud
Sacramento
San Francisco
Alameda
Pacific
Ocean
Los Angeles
San Diego
N
S
E
W
NOT TO SCALE
AllWest
PROJECT NO. 22002.28
WELL SURVEY LOCATION MAP
FIGURE 2
900 CENTRAL AVENUE
ALAMEDA, CALIFORNIA
SOURCE: USGS TOPO
PREPARED BY: ELIZA YU
DATE: 10/10/02



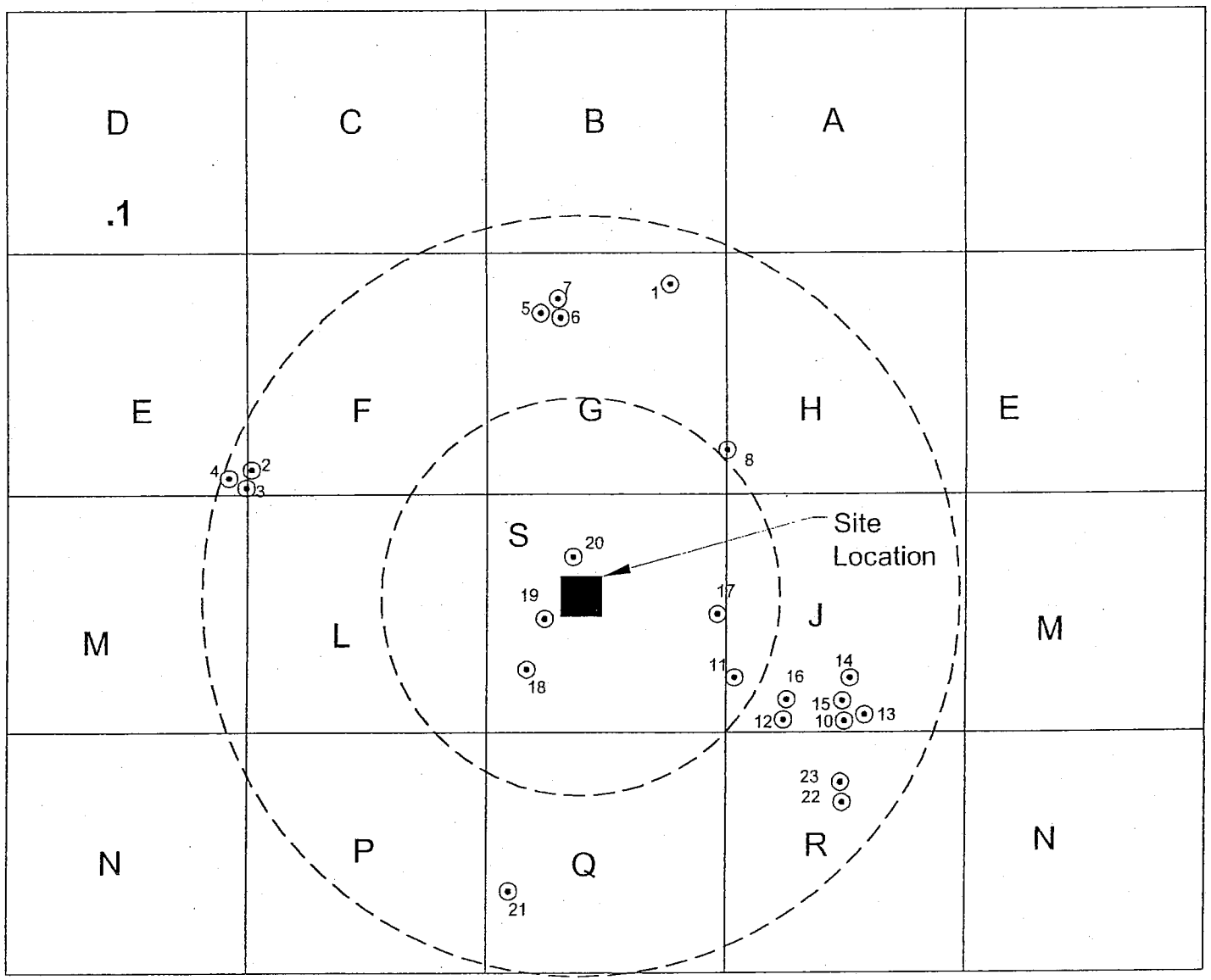
LEGEND

18 ⊙ - Well Location

AllWest	WELL SURVEY MAP
	900 CENTRAL AVENUE
	ALAMEDA, CALIFORNIA
PROJECT NO. 22002.28	SOURCE: ALLWEST
	PREPARED BY: I.R.R. (10/02/02)

APPROXIMATE
SCALE: 1" = 800'

0' 800'



LEGEND

18 ⊙ - Well Location

AllWest	WELL SURVEY MAP OVERLAY
	900 CENTRAL AVENUE
	ALAMEDA, CALIFORNIA
PROJECT NO. 22002.28	SOURCE: ALLWEST
	PREPARED BY: I.R.R. (10/02/02)

APPENDIX C
WELL SURVEY RESULTS

900 Central Avenue, Alameda, California

ID	Well #	Township/ Range	Section	Total Depth	Screen Interval	Casing Diameter	Water Level	Use	Location	Dist (mile)	Dist (feet)
#1	3-1797	2S/4W	11A80	120	unknown	unknown	unknown	Cath Prot	Pacific Av S/O Chapin	0.35	1848
#2	MW-1	2S/4W	11F4	24	6-24	2	unknown	Mon	1435 Webster St/Taylor	0.38	2006
#3	MW-2	2S/4W	11F5	24	6-24	2	unknown	Mon	1435 Webster St/Taylor	0.38	2006
#4	MW-3	2S/4W	11F6	24	6-24	2	unknown	Mon	1435 Webster St/Taylor	0.38	2006
#5	MW-1	2S/4W	11G1	16.5	5-15	2	10	Mon	901 Lincoln Av	0.30	1584
#6	MW-2	2S/4W	11G2	18	8-18	2	10	Mon	901 Lincoln Av	0.30	1584
#7	MW-3	2S/4W	11G3	18	8-18	2	10	Mon	901 Lincoln Av	0.30	1584
#8	1-1837	2S/4W	11H	120	unknown	unknown	unknown	Cath Prot	Santa Clara E/O Verdi St	0.22	1162
#9	MW-3	2S/4W	11H4	20	5-20	4	7	Mon	1127 Lincoln Av E/O Bay S	0.40	2112
#10	unknown	2S/4W	11J1	70	55-70	4	14	Irrig	1205 Bay St	0.32	1690
#11	32175	2S/4W	11J2	68	unknown	4	15	Irrig	1036 San Antonio Av	0.18	950
#12	unknown	2S/4W	11J3	80	65-80	4	20	Irrig	1236 St Charles	0.25	1320
#13	unknown	2S/4W	11J4	75	53-73	4	14	Irrig	1224 Bay St	0.33	1742
#14	unknown	2S/4W	11J5	unknown	unknown	unknown	14	Irrig	1200 San Antonio Av	0.30	1584
#15	unknown	2S/4W	11J6	60	40-60	5	10	Irrig	1251 Bay St	0.25	1320
#16	unknown	2S/4W	11J7	60	40-60	5	10	Irrig	1261 St Charles	0.25	1320
#17	unknown	2S/4W	11J8	60	40-60	5	10	Irrig	1040 Fair Oaks Dr	0.15	792
#18	unknown	2S/4W	11K1	unknown	unknown	3	9		801 San Antonio Av	0.11	581
#19	unknown	2S/4W	11K2	70	24-70	6	18	Irrig	920 Centennial	0.05	264
#20	unknown	2S/4W	11K3	75	30-70	unknown	15	Mon	905 Central E/O 9th	0.05	264
#21	MW-1	2S/4W	11Q1	20	2-20	4	3	Dewater	900 Otis Dr	0.33	1742
#22	unknown	2S/4W	11R1	70	unknown	4	unknown	Irrig	1204 Bay	0.35	1848
#23	unknown	2S/4W	11R2	70	unknown	4	unknown	Irrig	1209 Bay	0.35	1848

Regulatory History

GRAY & KAREN PEARCE (ALAMEDA)
900 CENTRAL AVE
ALAMEDA , CA 94501
CASE STATUS: OPEN
(Show this Site on Map)

Regional Board - Case #: 01-2273
SAN FRANCISCO BAY RWQCB (REGION 2) - **(BG)**
Local Agency (lead agency) - Case #: 6897
ALAMEDA COUNTY LOP - **(UNK)**

Begin Date	Status
1/1/1975	Leak Stopped
4/20/1994	Leak Discovery
9/19/1997	Leak Reported
1/23/1998	3B - Preliminary Site Assessment Underway
1/23/1998	System Entry
4/5/2001	Regulatory Review

Geotracker Home | Site/Facility Finder | Case Finder | MTBE/Case Reports

Detailed Release Information

GRAY & KAREN PEARCE (ALAMEDA)
900 CENTRAL AVE
ALAMEDA , CA 94501
CASE STATUS: OPEN
(Show this Site on Map)

Regional Board - Case #: 01-2273
SAN FRANCISCO BAY RWQCB (REGION 2) - **(BG)**
Local Agency (lead agency) - Case #: 6897
ALAMEDA COUNTY LOP - **(UNK)**

Case Type:
Soil Only

Enforcement Type:

Funding:
F

How leak was discovered:
Tank Closure

Method used to stop discharge:
Close Tank

Interim:

Cause of leak:
UNK

Source of leak:
UNK

SUBSTANCES RELEASED:

Begin Date	Substance	Quantity
UNKNOWN	GASOLINE	

Geotracker Home | Site/Facility Finder | Case Finder | MTBE/Case Reports

Regulatory History

CHEVRON (ALAMEDA)
900 OTIS DR
ALAMEDA , CA 94501
CASE STATUS: CLOSED
(Show this Site on Map)

Regional Board - Case #: 01-0388
SAN FRANCISCO BAY RWQCB (REGION 2) - **(BG)**
Local Agency (lead agency) - Case #: 598
ALAMEDA COUNTY LOP - **(UNK)**

Begin Date	Status
8/1/1989	Leak Discovery
8/1/1989	Leak Reported
8/1/1989	Leak Stopped
9/28/1990	System Entry
11/13/1997	8 - Verification Monitoring Underway
2/2/1999	9 - Case Closed
3/18/1999	Regulatory Review

Geotracker Home | Site/Facility Finder | Case Finder | MTBE/Case Reports

Detailed Release Information

CHEVRON (ALAMEDA)
900 OTIS DR
ALAMEDA , CA 94501
CASE STATUS: CLOSED
(Show this Site on Map)

Regional Board - Case #: 01-0388
SAN FRANCISCO BAY RWQCB (REGION 2) - **(BG)**
Local Agency (lead agency) - Case #: 598
ALAMEDA COUNTY LOP - **(UNK)**

Case Type:
Other Groundwater

Enforcement Type:

Funding:
F

How leak was discovered:
Tank Closure

Method used to stop discharge:
Close Tank

Interim:
Y = Interim Action Taken

Cause of leak:
Structural Failure

Source of leak:
Tank

SUBSTANCES RELEASED:

Begin Date	Substance	Quantity
UNKNOWN	GASOLINE	

Geotracker Home | Site/Facility Finder | Case Finder | MTBE/Case Reports