AllWest

AllWest Environmental, Inc.

Specialists in Physical Due
Diligence and Remedial Services

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WORKPLAN
FOR
GROUNDWATER MONITORING WELL
INSTALLATION AND SAMPLING
AT
900 CENTRAL AVENUE
ALAMEDA, CALIFORNIA

Prepared for:

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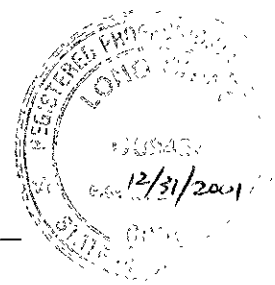
AllWest Project No. 98115.23
June 29, 1998



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For RH.

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WORKPLAN
FOR
GROUNDWATER MONITORING WELL
INSTALLATION AND SAMPLING
AT
900 CENTRAL AVENUE
ALAMEDA, CALIFORNIA

I. INTRODUCTION

This workplan describes a groundwater monitoring well installation and sampling program to be implemented at 900 Central Avenue, in Alameda, California. The program is formulated to comply with Alameda County Environmental Health Services' March 9, 1998 requirement to monitor the groundwater quality of the subject property.

Included with this workplan is: 1) background information, 2) the scope of the proposed work, 3) descriptions of field procedures, sampling protocols, and analytical methods, and 4) project staff and schedule. Maps showing the site location and the proposed monitoring well locations are presented in Figures 1 and 2. Also included are example sampling logs and log legends (Appendix A) and a site specific health and safety plan (Appendix B).

A. Background Information

The subject property is located in the central-southern portion of Alameda amidst a predominantly residential area. The property is at the southeast corner of Central Avenue and Ninth Street. The site improvements consist of a two-story wood-frame duplex apartment with surrounding landscaped areas. A site location map and a generalized site plan are presented in Figures 1 and 2.

According to a 1994 Lowney Associates report, the subject property was used as a gas station with underground fuel storage tanks between 1931 and 1977. Lowney Associates also conducted a soil and groundwater sampling program at the site in 1994 to evaluate the potential of subsurface impact due to historical site use. The sampling program included the advancement of three borings, the collection of soil and grab groundwater samples, and the chemical analyses of selected samples. Lowney Associates reported that soil and groundwater samples from boring EB-1, located near the northwest corner of the subject property, contained elevated levels of gasoline (TPH-g) and fuel volatiles (BTEX).

In 1997, AllWest was retained to review and verify Lowney's 1994 findings. AllWest's 1997 investigation included the review of historical documents related to past site usage, the advancement of eight soil borings via the Geoprobe method to collect soil and groundwater

samples, the chemical analyses of selected samples for TPH-g and BTEX, and a preliminary risk assessment using the ASTM RBCA process. The 1997 investigation results indicated that no source area is located at the subject site, the majority of contaminated groundwater beneath the site is limited to the northwest corner, the extent of the groundwater contamination extend beyond the site boundary, and the former tank site is likely located in the public right-of-way, at the sidewalk of Central Avenue. The preliminary risk assessment indicated that the portion of groundwater contamination plume beneath the subject property is unlikely to cause excessive cancer risk to site occupants.

The results of the 1997 AllWest investigation were submitted to Alameda County Environmental Health Services (ACEHS), the lead regulatory agency for leaking underground storage tank sites in the City of Alameda. In March 1998, the County issued a letter requesting quarterly groundwater monitoring for a minimum of one year at the subject site. Groundwater samples are required to be analyzed for the presence of TPH-g, BTEX, and methyl tert-butyl ether (MTBE), a fuel oxygenate.

II. PURPOSE AND SCOPE OF WORK

The purpose of this workplan is to formulate a groundwater monitoring program to comply with the County requirements. The scope of work, as proposed by AllWest in this workplan, consists of the following tasks:

1) Prepare a written workplan and a site specific health & safety plan for installing three groundwater monitoring wells at the site. Submit the plans to the lead regulatory agency, the Alameda County Environmental Health Services (ACEHS), for agency review and concurrence. Obtain a drilling permit from Alameda County Public Works Department.

2) Engage the service of Underground Service Alert (USA) and a private underground utility locator to locate and clear underground utilities within the proposed drilling area so that the potential of accidental damage to underground utilities will be reduced.

3) Advance three soil borings near the northeast, northwest, and southwest corners of the subject property to depths of approximately 20 feet. Convert the borings into 2-inch diameter groundwater monitoring wells. The proposed well locations are indicated on Figure 2 of this workplan. Which well(s) are in the assumed downgradient direction?

4) Develop the newly installed groundwater monitoring wells and collect one groundwater sample from each well after the well development. Perform a wellhead elevation survey to determine the groundwater flow direction and gradient.

5) Maintain samples under chain-of-custody and transport the samples to a California Department of Health Services (DHS) certified analytical laboratory for chemical

analyses. Analyze the groundwater samples to detect the presence of total petroleum hydrocarbons in the gasoline range (TPH-g) with EPA method m8015 and the BTEX/MTBE compounds with EPA method 8020.

6) Prepare a written report describing the well installation and sampling activities, summarizing the laboratory data, presenting investigation findings, and providing conclusions and recommendations.

7) Conduct three quarters of groundwater monitoring subsequent to well installation and initial groundwater sampling. Prepare a quarterly monitoring report describing the quarterly monitoring activities and summarizing the analytical results after each quarterly groundwater monitoring event.

III. FIELD ACTIVITIES

A. Underground Utility Clearing

To avoid damage to underground utility installations during the course of borehole drilling and well installation, AllWest will contact Underground Service Alert (USA), an organization for public utility information, on the pending subsurface investigation. USA then will notify each of the public and private entities that maintained underground utilities at the site to locate and mark their installations for field identification. AllWest will also retain the service of a private underground utility locating company to verify the USA markings and to conduct a sweep of the proposed drilling sites to locate unmarked utilities, if any. The proposed drilling sites will be relocated if in conflict with underground utilities. The final drilling locations will be cleared of known underground utilities.

B. Borehole Drilling

Three soil borings are planned for this project. The proposed boring locations are selected near the northwest, northeast, and southwest corner of the subject property to provide adequate well separation for groundwater gradient triangulation and plume boundary definition. The boring locations are graphically depicted on Figure 2 of this workplan. A drilling permit will be obtained from the Alameda County Public Works Department prior to the commencement of drilling. The ACEHS will also be notified of the drilling date to allow for agency inspection, as necessary. The borehole drilling will be performed by Bay Area Exploration of Cordelia, California, a drilling contractor with a current C-57 license. The boring will be drilled with 3.75-inch inside diameter (I.D.) hollow stem augers. During the drilling operation, a field geologist or engineer from AllWest will be present to maintain a boring log and to supervise the drilling activities. The boring log will contain all pertinent information on drilling and soil conditions. The boring log will be included in the final written report. A copy of the field boring log to be used, the boring log legend, and the Unified Soil Classification System (USCS) is included in Appendix A.

C. Groundwater Monitoring Well Installation

A groundwater monitoring well will be installed in each of the boreholes after the designated boring termination depth is reached. The well will be installed through the center of the hollow stem augers. After the well casing has been set, the augers will be removed in sections while the sand filter pack is being placed. Well casing composed of 2-inch diameter schedule-40 PVC pipes will be employed. The screen section of the casing will have factory perforated 0.02-inch slots and extend 10 feet below and 5 feet above the groundwater table. The blank section (non-perforated well casing pipe) will complete the well casing up to the ground surface. The length of screen and blank section of well casing will be adjusted in the field in accordance with groundwater and soil conditions encountered.

The filter pack around the well screen will be pre-washed #3 Monterey sand placed from the bottom of the well up to one foot above the screen section. A 1-foot bentonite seal will then be placed above the filter pack to prevent surface water infiltration. The remaining length of the annular space in the borehole will be backfilled with neat cement grout up to 2 feet below the ground surface. The uppermost two feet of the well casing will be protected by a traffic-rated Christy box set in concrete. A water-tight locking end-cap will be placed on top of the well casing to prevent surface water intrusion and unauthorized access. A diagram of typical groundwater monitoring well construction is included in Appendix A.

D. Groundwater Sampling Procedures

The newly installed groundwater monitoring wells will be developed no sooner than 72 hours after the well installation to allow stabilization of the subsurface conditions. The well will be developed with the combination of surging and pumping actions. The physical characteristics of the groundwater, such as water color and clarity, pH, temperature, and conductivity, will be monitored during well development. Well development will be considered complete when the groundwater is relatively sediment-free and groundwater characteristic indicators are stabilized (consecutive readings within 10% of each other).

Groundwater will be sampled from the developed wells no sooner than 48 hours after well development to allow stabilization of groundwater conditions. Prior to groundwater sampling, a proper purging process will be performed at each well. The purpose of well purging is to remove fine grained materials from the well casing and to allow fresh and more representative water to recharge the well. Prior to well purging, an electric water depth sounder will be lowered into the well casing to measure the depth to the water to the nearest 0.01 feet. A clear poly bailer will then be lowered into the well casing and partially submerged. Upon retrieval of the clear bailer, the surface of the water column retained in the bailer will be carefully examined for any floating product or product sheen.

After all initial measurements are completed and recorded, the well will be purged by an electrical submersible pump or a bailer. A minimum of 3 well volumes of groundwater will be purged and groundwater characteristics (temperature, pH, and conductivity) monitored at each

well volume interval. Purging is considered complete when indicators are stabilized (consecutive readings within 10% of each other) and the purged water is relatively free of sediments.

Groundwater sampling will be conducted after the water level has recovered to at least 80% of the initial level, recorded prior to purging. The groundwater sample will be collected by a disposable bailer. Upon retrieval of the bailer, the retained water will be carefully transferred to appropriate sample bottle furnished by the analytical laboratory. All sample bottles will have a Teflon lined septum/cap and be filled such that no headspace is present. Then the sample bottles will be labeled and immediately placed on ice to preserve the chemical characteristics of its content.

To prevent cross contamination, all groundwater sampling equipment that comes in contact with the groundwater will be thoroughly decontaminated prior to sampling. A disposable bailer will be used to collect the groundwater samples. Sample handling, storage, and transport procedures described in the following sections will be employed. All well development and purging water will be temporarily stored on-site in 55-gallon drums awaiting test results to determine the proper disposal method.

E. Quarterly Groundwater Monitoring

At least three quarterly groundwater monitoring will be conducted after the initial groundwater well development and sampling. Quarterly groundwater monitoring will employ the same groundwater sampling procedures described in previous section without additional well development. The first quarterly groundwater monitoring will be conducted approximately three months after the initial groundwater sampling or during the last month of each quarter (March, June, September, December) which ever is appropriate for the project.

IV. QUALITY ASSURANCE / QUALITY CONTROL PROGRAM

A. Sample Preservation, Storage and Handling

To prevent the loss of constituents of interest, samples will be preserved by storing them in an ice chest cooled to 4°C with crushed ice immediately after collection and during transportation to the laboratory. The standard chain-of-custody protocols will be followed through all stages of sample handling.

B. Field Quality Control Samples

To detect the occurrence of cross-contamination during sampling and to reduce the probability of false-positive results, a field or travel blank will be included with each shipment of samples sent to the laboratory.

C. Chain-Of-Custody Program

All samples collected for this project will be transported under chain-of-custody protocols. The chain-of-custody program allows for the tracing of possession and handling of individual samples from the time of field collection through laboratory analysis. The document includes the signature of the collector, date and time of collection, sample number, number and type of sample containers including preservatives, parameters requested for analysis, signatures of persons and inclusive dates involved in the chain of possession. Upon delivery to the laboratory the document will also include the name of person receiving the samples, and date and time samples were received. A sample copy of the chain-of-custody form is included in Appendix A.

D. Decontamination Procedures and Waste Disposal

During field sampling all down-hole tools will be thoroughly steam cleaned prior to drilling. All sampling equipment will be thoroughly cleaned in an Alconox (or other phosphate-free detergent) solution and rinsed with potable water prior to use. The rinsate will be contained along with the steam cleaning rinsate from the auger decontamination described above. Disposable sampling devices will be employed where applicable to reduce the frequency of re-using the same equipment. Soil cuttings from drilling operations and rinsate water from decontamination will be contained in 55-gallon drums and stored temporarily on-site. Only those drums that meet Department of Transportation (DOT) specifications will be used. Proper disposal methods for these drummed materials will be determined based on analytical findings.

V. ANALYTICAL METHODS

All samples selected for chemical analyses will be analyzed by a California Department of Health Services (DHS) certified independent analytical laboratory. Chromalab of Pleasanton, California will provide the analytical services. However, other qualified laboratories may be utilized dependent on work load and time frame considerations. Analytical methods proposed for this project include: total petroleum hydrocarbons as gasoline (TPH-g) by EPA method m8015 and BTEX/MTBE compounds by EPA method 8020. All laboratory analyses will be performed under the one-week turn-around-time schedule.

VI. REPORT PREPARATION

A written report summarizing the results of the groundwater monitoring well installation and sampling will be prepared at the completion of the first five task elements. The report will contain descriptions of field activities, subsurface profiles, laboratory results, and conclusions and recommendations. Also included in the report will be a boring location map, logs of soil boring, well construction, and groundwater sampling, chain-of-custody documents, and copies of the analytical laboratory reports. The report will be prepared/reviewed by a California registered civil engineer or geologist.

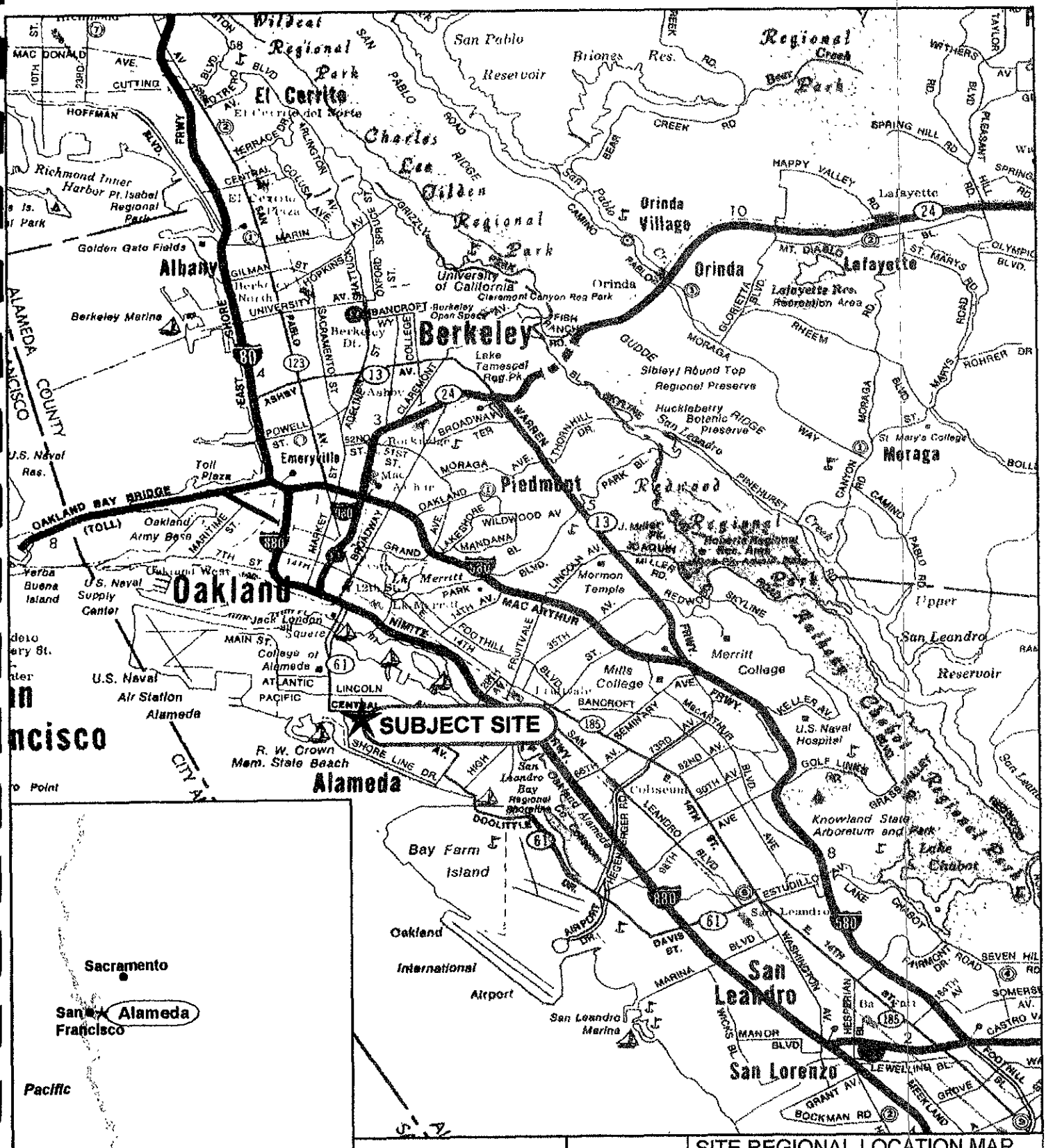
A quarterly monitoring report will be prepared at the completion of each quarterly groundwater monitoring event. The quarterly monitoring report will contain a brief description of the quarterly monitoring activities performed and the results of laboratory analyses. The quarterly monitoring report will also be prepared/reviewed by a California registered civil engineer or geologist.

VII. PROJECT STAFF AND SCHEDULE

Mr. Long Ching, a California registered civil engineer, will provide technical oversight for this project and act as the project manager and regulatory liaison. Additionally, AllWest's staff of engineers, geologists, and technicians will be employed to perform the various tasks of the project.

The initial well installation and sampling activities are planned to commence within 30 days of agency approval of this workplan. The written report will be submitted in 30 to 45 days after the completion of all field work. Quarterly monitoring report will be submitted within 30 days of the completion of the groundwater monitoring event or the end of each quarter. The project schedule may be revised dependent upon changes to site conditions, project activities, or agency requirements.

WP98115.23W



NOT TO SCALE

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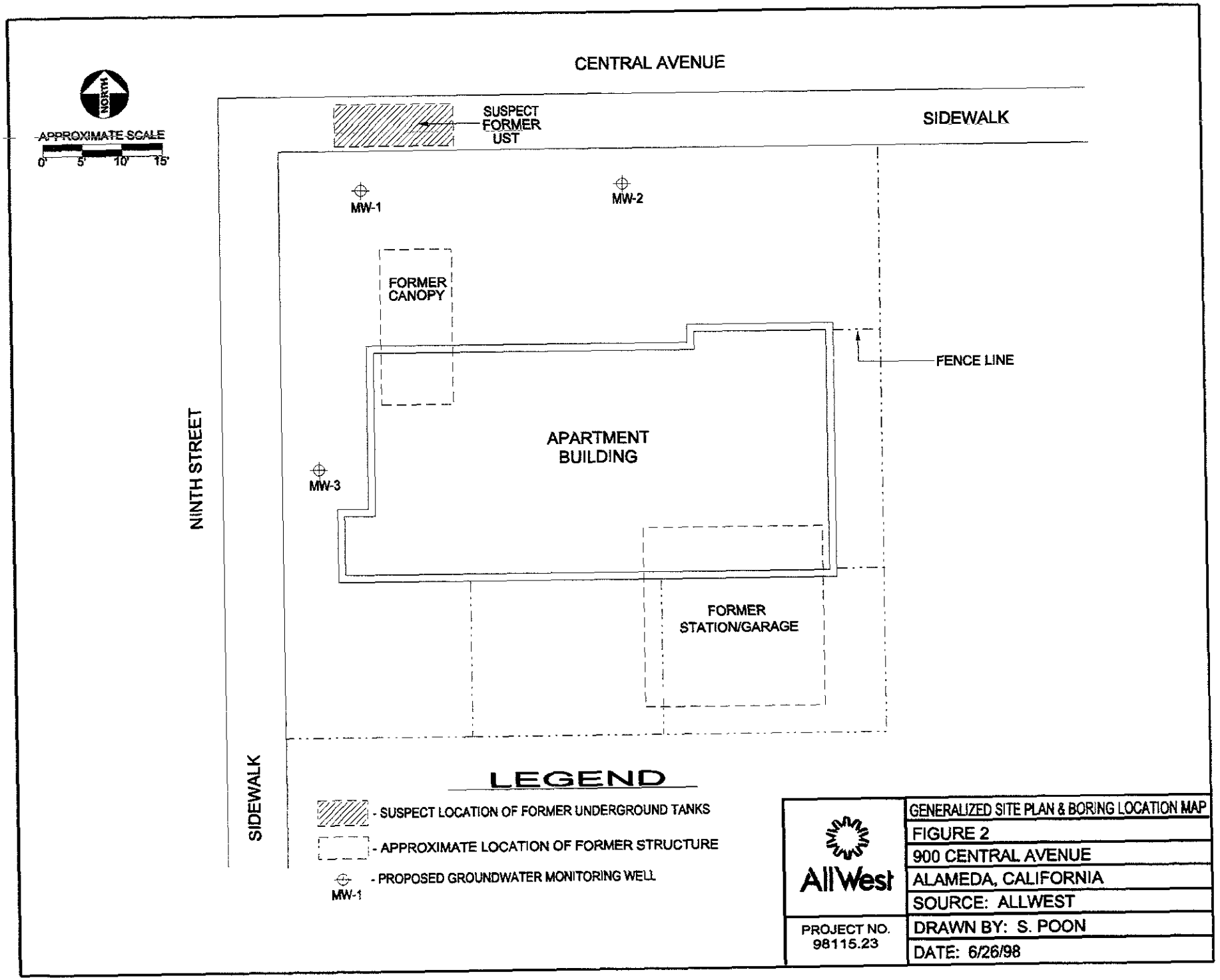
	SITE REGIONAL LOCATION MAP
	FIGURE 1
	900 CENTRAL AVENUE
	ALAMEDA, CALIFORNIA
	SOURCE: RAND MCNALLY
PROJECT NO. 98115.23	PREPARED BY: S. POON
	DATE: 6/26/98


CENTRAL AVENUE
NORTH
APPROXIMATE SCALE
0' 5' 10' 15'
SUSPECT FORMER UST
SIDEWALK
MW-1
MW-2
FORMER CANOPY
FENCE LINE
NINTH STREET
APARTMENT BUILDING
MW-3
FORMER STATION/GARAGE
SIDEWALK
LEGEND
- SUSPECT LOCATION OF FORMER UNDERGROUND TANKS
- APPROXIMATE LOCATION OF FORMER STRUCTURE
- PROPOSED GROUNDWATER MONITORING WELL
MW-1
AllWest
PROJECT NO. 98115.23
GENERALIZED SITE PLAN & BORING LOCATION MAP
FIGURE 2
900 CENTRAL AVENUE
ALAMEDA, CALIFORNIA
SOURCE: ALLWEST
DRAWN BY: S. POON
DATE: 6/26/98

UNIFIED SOIL CLASSIFICATION SYSTEM

PRIMARY DIVISIONS			GROUP SYMBOLS	SECONDARY DIVISIONS
COARSE GRAINED SOIL	GRAVELS More than half of course fraction is larger than No. 4 sieve.	Clean gravels (less than 5% of fines)	GW	Well graded gravel-sand mixtures, little or no fines.
			GP	Poorly graded gravels or gravel-sand mixtures, little or no fines.
		Gravel with fines	GM	Silty gravels or gravel-sand silt mixtures, with plastic fines.
			GC	Clayey gravels or gravel-sand-clay mixtures with plastic fines.
	SANDS More than half of course fraction is smaller than No. 4 sieve.	Clean sands (less than 5% of fines)	SW	Well graded sands or gravelly sands, little or no fines.
			SP	Poorly graded sands or gravelly sands, little or no fines.
		Sands with fines	SM	Silty sands or sand-silt mixtures, with non-plastic fines.
			SC	Clayey sands or sand-clay mixtures, with plastic fines.
FINE GRAINED SOIL	SILTS AND CLAYS Liquid Limit less than 50%		ML	Inorganic silts and very fine sands, rock flour, or clayey silts, with slight plasticity.
			CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays.
			OL	Organic silts and organic silty clays of low plasticity.
	SILTS AND CLAYS Liquid Limit greater than 50%		MH	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts.
			CH	Inorganic clays of high plasticity, fat clays.
			OH	Organic clays of medium to high plasticity, organic silts.
HIGHLY ORGANIC SOILS			PT	Peat and other highly organic soils.

BORING LOG LEGEND


Sampler Drive Interval


Relatively Undisturbed Sample Recovered and Preserved


Sampler Driven, No Sample Recovery


Disturbed Sample Recovered and Preserved

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Log of Boring:

Project Name:

Project Number:

Drilling Date:

Sheet of

Drilling Contractor:
Drill Rig:
Auger:

Sampler:
Hammer:
Logged By:

Blow Count	OVM Reading	Sample Interval	Depth in Feet	Well Profile	USCS Code	Soil Description
			1			
			2			
			3			
			4			
			5			
			6			
			7			
			8			
			9			
			10			
			11			
			12			
			13			
			14			
			15			
			16			
			17			
			18			
			19			
			20			
			21			

Groundwater Monitoring Well Sampling Field Log

Project No.: _____ Project Name: _____

Well No.: _____ Well Location: _____

Well Depth: _____ (ft.) Casing Diameter: _____ (in.)

Depth to Water: _____ (ft.) Date: _____ Time: _____

Water Column in Well: _____ (ft.) Well Volume: _____ (gal.)

Odor? _____ Free Product? _____ Thickness: _____

Purging Method: Hand Pump ____ Submersible Pump ____ Bailer ____ Other ____

Time	pH	Conduc. (μS)	Temp. (°C)	Water Level	Volume Removed	Remark

Purging Start Time: _____ Purging Stop Time: _____

Total Volume Purged: _____ (gal.) Well Dewater? _____

Water Level Prior to Sampling: _____ (ft.) Time: _____

Sampling Method: Teflon Bailer ____ Disposable Bailer ____ Sampling Pump ____

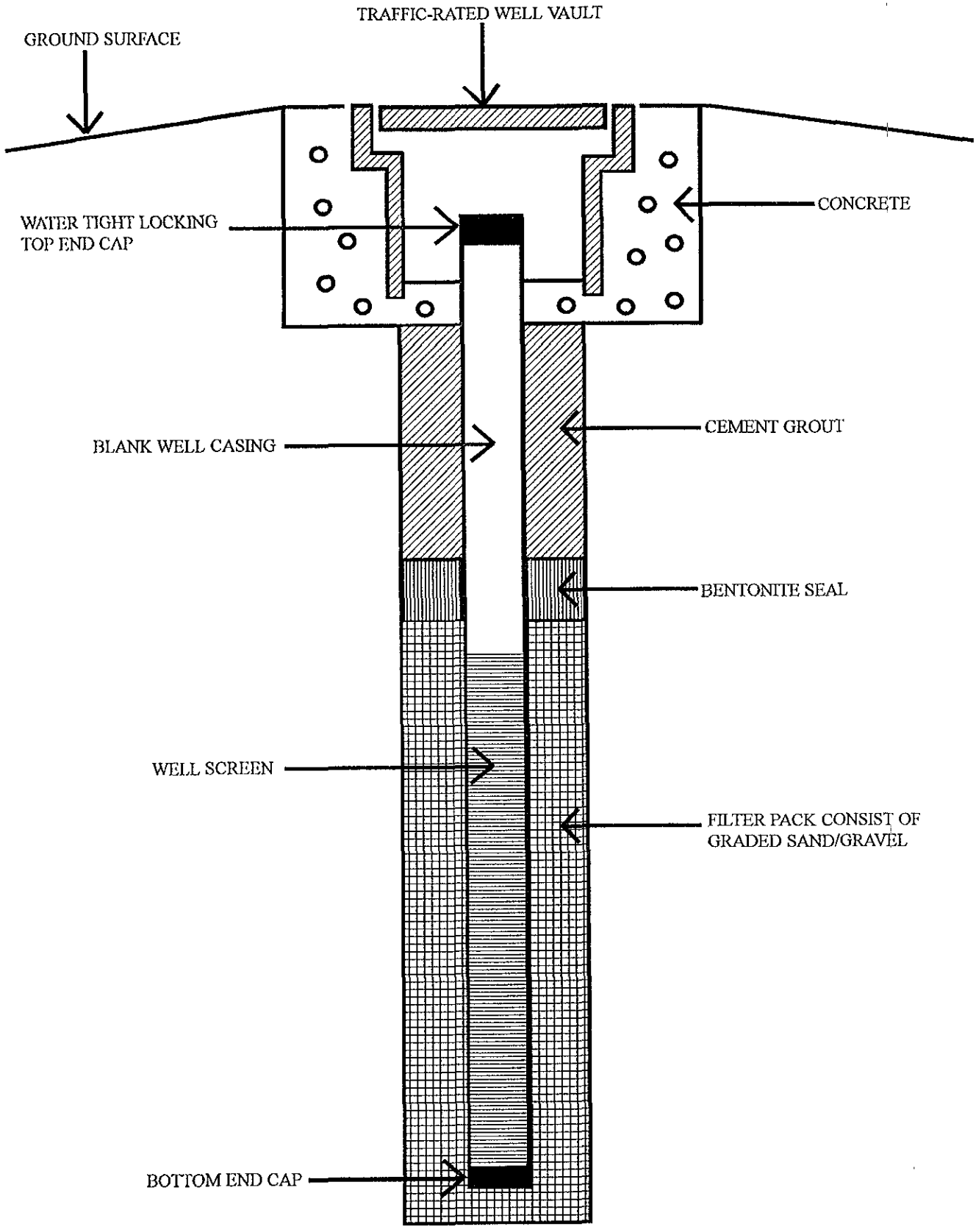
Sample Collected: _____ Sample No.: _____

Remark: _____

_____

_____

Sampler: _____ Date/Time: _____



TYPICAL WELL CONSTRUCTION DIAGRAM

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SITE SPECIFIC HEALTH AND SAFETY PLAN

Groundwater Monitoring Well
Installation and Sampling
at
900 Central Avenue
Alameda, California

ALLWEST PROJECT NO. 98115.23

June 29, 1998

PREPARED BY:

Long Ching
Senior Project Manger

REVIEWED BY:

Marvin Snapp
Health & Safety Manager

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TABLES AND ATTACHMENTS

SITE SPECIFIC HEALTH & SAFETY PLAN

Groundwater Monitoring Well
Installation and Sampling
at
900 Central Avenue
Alameda, California

I. ENTRY OBJECTIVES

AllWest Environmental, Inc. (AllWest) and Bay Area Exploration (CONTRACTOR) plan to install a groundwater monitoring well at the property located at 900 Central Avenue in Alameda, California. The purpose of the well installation and sampling is to comply with Alameda County Environmental Health Services' requirement for quarterly groundwater monitoring at the subject property. AllWest will be on site to direct the overall project and perform the environmental sampling.

II. ON-SITE ORGANIZATION AND COORDINATION

The following personnel are designated to carry out the job function(s):

Project Manager	Long Ching, AllWest Environmental
Project Geologist	Robert Horwath, AllWest Environmental
Health & Safety Manager	Marvin Snapp, AllWest Environmental
Site Safety Officer	Long Ching, AllWest Environmental
Contractor	Bay Area Exploration

Other personnel from the following businesses/agencies may be on site:

Underground Service Alert
California Utility Survey
Alameda County Environmental Health

All personnel arriving/departing the site must notify the Project Manager and the CONTRACTOR's Site Superintendent or Foreman.

ERIIS ENVIRONMENTAL DATA REPORT
COMPREHENSIVE ENVIRONMENTAL RESPONSE, COMPENSATION, AND LIABILITY INFORMATION SYSTEM
CERCLIS - PLOTTABLE SITES - PAGE 1

ERIIS Report #253731A Jun 26, 1998

ERIIS ID / EPA ID	FACILITY	ADDRESS	MAP ID
06001000232 CAT000624957	Myers Drum #2 DISTANCE FROM SITE: 0.39 Miles DIRECTION FROM SITE: Southwest	4500 Shellmound St Emeryville, CA 94608-2406 County: Alameda	47

PRIOR YEAR OBLIGATION: No Funding Indicated
CURRENT YEAR OUTLAYED: No Funding Indicated

SITE EVENT(S)	START DATE	COMPLETION DATE
Discovery		10/18/93

III. SITE BACKGROUND

Site Status: _X_ Active __ Inactive __ Unknown

Site Description: The subject property is located in the central-southern portion of Alameda amidst a predominantly residential area. The property is at the southeast corner of Central Avenue and Ninth Street. The site improvements consist of a two-story wood-frame duplex apartment with surrounding landscaped areas. Historical documents indicate the subject property was a gas station with underground fuel storage tanks between 1931 and 1977. Previous subsurface investigations at the site detected gasoline contaminated groundwater beneath the northwest corner of the subject property.

Waste Types: _X_ Liquid _X_ Solid __ Sludge __ Gas __ None

Waste Characteristics:

__ Corrosive	__ Flammable	__ Inert
_X_ Volatile	__ Reactive	_X_ Toxic
__ Radioactive	_X_ Irritant	__ Other

Waste Categories: Wastes that may be encountered during the proposed subsurface investigation are soil cuttings, soil samples, purged groundwater, groundwater samples and decontamination water that may containing low concentrations of petroleum hydrocarbons and/or fuel related volatile organic compounds.

IV. HAZARDS

Hazards Rating: __ High __ Moderate _X_ Low __ Unknown

Hazards/Toxic Substances Likely To Be Encountered: Based on previous site usage information, the likely contaminant that would be encountered at the site is soil and/or groundwater that may contain petroleum hydrocarbons and volatile organic compounds (VOC) in low concentrations. Observe the necessary precautions while handling soil cuttings, decontamination rinsates from drilling and sampling activities.

Reactivity, Stability, Flammability Of Substance(s): Materials generated from the subsurface investigation may contain low levels of petroleum hydrocarbons and VOC. Those materials are not considered reactive, flammable, or unstable.

Weather Conditions Anticipated: Possible adverse weather conditions to be anticipated on site are extreme temperatures, strong winds, and/or heavy precipitations.

V. PERSONAL PROTECTION

The level of personal protection designated here should be considered the minimal acceptable level. Project personnel may elect to upgrade the level of protection at their discretion.

Level of Protection Required: __ A __ B __ C X D (Minimum)

Level D protection includes hard hat, steel-toed safety boot, and proper work clothing.

Personal Protective Equipment: A minimum of Level D protection will be required for all personnel within the exclusion zone. Safety glasses, hearing protection, and neoprene gloves will be worn if conditions warrant them. Should the level of volatiles present in the breathing zone increase to 100 ppm, Level C protection will be required. Level C protection includes PVC boots, a tyvek suit, an air purifying respirator equipped with combination cartridges (particulate and organic vapor), and protective gloves in addition to the Level D protection.

General Equipment: Health and Safety related equipment to be used on site includes two 20 BC type fire extinguishers, one organic vapor meter (OVM), and one first aid kit. The above equipment will be provided by the CONTRACTOR.

VI. DECONTAMINATION PROCEDURES

All operations conducted at this site have the potential to contaminate monitoring equipment and personal protective equipment (PPE). To prevent the transfer of contamination to vehicles, administrative areas and personnel, the following procedures must be followed:

- Equipment Decontamination

  Whenever possible, equipment should be decontaminated with a solution of Alconox or soap and thoroughly rinsed with water prior to leaving the site. This must be done outside a 10-foot radius of any work area.

- Personal Decontamination

  Level D
  Segregated equipment drop
  Wash/rinse outer boot (as appropriate)
  Wash/rinse chemical resistant outer glove, then remove (as appropriate)

Remove hard hat, goggles/safety glasses/face shield
Remove and throw out inner disposable gloves in designated lined receptacles (as appropriate)

Level C
Segregated equipment drop
Wash/rinse outer boots
Wash/rinse chemical resistant outer gloves, then remove
Remove outer boots and place to dry (if reusable)
Remove chemical resistant suit (remove by rolling down the suit)
Remove first pair(s) of disposable gloves
Remove respirator/hard hat/face shield dispose of cartridges and wash respirator
Remove last pair of disposable gloves

VII. CHEMICAL OF CONCERN

Potential health effects from a chemical exposure are dependant on several exposure factors such as toxicity of substances, duration of exposure, concentration during exposure and the overall health of the person exposed.

The hazardous chemicals encountered during this investigation are anticipated to be: petroleum hydrocarbons and VOCs. Short-term exposure to petroleum hydrocarbons and VOCs may cause dizziness, nausea, vomiting, and fever. Long term exposure to petroleum hydrocarbons and VOCs may cause lung, liver, and kidney damage and increase the probability of cancer risk.

VIII. MSDS INFORMATION

Material Safety Data Sheets (MSDS) on chemical substances encountered at the site shall be made available to all persons (including subcontractors) working at the site. For emergency situation not specifically addressed by this site safety plan refer to MSDS recommendations for action information.

IX. GENERAL PROJECT SAFETY REQUIREMENTS

Project activities will be conducted in accordance with the following minimum safety requirements:

Eating, drinking, and smoking will be restricted to a designated area.

Gross decontamination and removal of all personal protective equipment will be performed prior to leaving the site. Contaminated clothing will be removed and collected in a drum for disposal.

Shaking or blowing of potentially contaminated clothing or equipment to remove dust or other materials not permitted.

The Site Safety Officer will be responsible for taking necessary steps to protect employees from physical hazards, including

Falling objects, such as tools or equipment.
Falls from elevations.
Tripping over hoses, pipes, tools, or equipment.
Slipping on wet or oily surfaces.
Insufficient or faulty protective equipment.
Insufficient or faulty equipment or tools.

All personnel will be required to wash hands and faces before eating, drinking or smoking.

Field operations personnel will be cautioned to inform each other of the non-visual effects of the presence of toxics, such as,

Headaches
Dizziness
Nausea
Blurred vision
Cramps
Irritation of eyes, skin, or respiratory tract
Changes in complexion or skin discoloration
Changes in apparent motor coordination
Changes in personality or demeanor
Excessive salivation or changes in pupillary response
Changes in speech ability or pattern

Exposure to Cold Temperature: Hyperthermia can occur when a person is working in a cold environment. Work schedules will be adjusted to provide sufficient rest periods in a heated area for warming up. Thermal protective clothing, such as wind and/or moisture resistant outer wear is recommended to be worn. Dehydration, or loss of body fluids, occurs in a cold environment and may increase the susceptibility of the worker to cold injury due to a significant change in blood flow to the body extremities. Warm sweet drinks and soups should be provided at the work site to provide caloric intake and fluid volume. The intake of coffee should be limited.

Exposure to Hot Temperature: Heatstroke and heat exhaustion can occur when a person is working in a hot environment, sitting in a hot automobile, or over-exerting while performing field duties such as monitoring or surveying. Work schedules will be adjusted to provide sufficient rest periods in a shaded area for cooling purposes. Avoiding direct sunlight will not necessarily protect a person from the ill effects of heat. It is possible to suffer heatstroke even when the temperature is fairly low. Excessive humidity can induce over-heating by interfering with the perspiration evaporation-cooling process of the body, causing excessive sweating and the loss of salt and water.

Heat Exhaustion

The signs and symptoms of heat stroke or heat exhaustion are variable with the developing condition. Headache, a light to severe dizziness, some mental confusion or loss of physical coordination; and pale, sweaty skin are all symptoms of heat exhaustion. To care for a person who has suffered heat exhaustion, move them to a cool place and keep them at rest. Fan the patient's body to expedite the cooling process, and watch for the signs of shock. If the patient becomes unconscious, or fails to recover rapidly, alert the local EMS service.

Heat Stroke (a.k.a. "Sunstroke")

Heat stroke is a much more serious condition than heat exhaustion. The temperature of the body can rise to such a point that the victim's brain cells will start to die. The EMS system must be notified immediately upon determination that heat stroke has or is occurring. Symptoms of heatstroke are dry, hot skin, deep breaths followed by shallow breathing, dilated (large) pupils, loss of consciousness, and convulsions or twitching of the muscles. Care for the patient includes cooling the body as quickly as possible, in any manner possible. Removing the clothing and placing wetted towels or sheets over the patient will help cool the body down. If available, ice packs can be placed in strategic locations on the body, such as under the armpits, on the ankles, or resting on the neck, in order to speed the cooling. Remember that the EMS system must be alerted immediately upon the determination that heat stroke is occurring or has occurred.

Replacement of the electrolytes lost during sweating is very important. Copious amounts of liquids must be consumed to replace these and balance out the blood. Quickick, Squincher, or Gatoraide are three examples of beverages that will allow the electrolyte balance to be restored. Many contractors will have drinks of this type available for their personnel, and the employees performing the work should be encouraged to drink as often as possible, even when they are not thirsty. Make sure that the proper drinks are specified. The choice of on-the-job clothing is very important. Cotton is a very good choice for hot

summer weather. When working in Personal Protective Equipment such as Tyvek suits, it is essential to strip down as far as possible.

Careful monitoring of the employees engaged in demanding work during hot, humid days is a must to guard against the dangers of heat exhaustion and heat stroke, but as an employee of AllWest, you need to *protect yourself first* from the dangers of overheating in the field. Know the warning signs and first aid necessary to prevent heat stroke and heat exhaustion.

X. MEDICAL SURVEILLANCE

CONTRACTOR and subcontractors engaged in project activities must be participants in a medical surveillance program and must be cleared by the examining physician(s) to wear respiratory protection devices and protective clothing for working with hazardous materials. The applicable requirements under 29 CFR 1910.120 of the Federal Administrative Code will also be observed.

XI. SAFETY AND ORIENTATION MEETING

Field personnel from the CONTRACTOR and its subcontractors will attend a project-specific training meeting for safety issues and review the project tasks before beginning work. The meeting will be led by the Site Safety Officer. In addition, fit-testing of respiratory protective devices will be conducted as part of the safety orientation meeting when the use of a respirator may be required.

XII. WORK ZONES AND SECURITY MEASURES

The area where active work is being performed will be designated as an Exclusion Zone. Only essential personnel with proper PPE will be allowed into an Exclusion Zone. When it is practical and local topography allows, approximately 20 to 75 feet of space surrounding the Exclusion Zone will be designated as a Contamination Reduction Zone.

XIII. TRAFFIC CONTROL

CONTRACTOR is responsible for providing necessary traffic controls if required. Cones, wooden barricades, or a suitable alternative will be used to deny the public access to the Contamination Reduction Zone. If for any reason the safety of a member of the public (e.g., motorist or pedestrian) may be endangered, work will cease until the situation is remedied. Cones and warning sign will be used when necessary to redirect motorists or pedestrians.

XIV. PROJECT PERSONNEL

AllWest Environmental, Inc. will oversee and act accordingly during all phases of the project. The following management structure will be instituted for the purpose of successfully and safely completing this project.

Project Manager

The Project Manager will be responsible for implementing the project and obtaining any necessary personnel or resources for the completion of the project. Specific duties will include:

Coordinate the activities of CONTRACTOR and all subcontractors, to include informing them of the required personal protective equipment and insuring their signature acknowledging this Site Health and Safety Plan (Attachment A),

Select a Site Safety Officer and field personnel for the work to be undertaken on site.

Ensure that the tasks assigned are being completed as planned and on schedule,

Provide authority and resources to ensure that the Site Safety Officer is able to implement and manage safety procedures,

Prepare reports and recommendations about the project to clients and affected AllWest Environmental, Inc. personnel,

Ensure that persons allowed to enter the site (i.e., EPA, contractors, state officials, visitors) are made aware of the potential hazards associated with the substances known or suspected to be on site, and are knowledgeable as to the on-site copy of the specific site safety plan.

Ensure that the Site Safety Officer is aware of all of the provisions of this site safety plan and is instructing all personnel on site about the safety practices and emergency procedures defined in the plan, and

Ensure that the Site Safety Officer is making an effort to monitor site safety, and has designated a Field Team Leader to assist with the responsibility when necessary.

Health & Safety Manager

The Health & Safety Manager shall be responsible for the overall coordination and oversight of the site health and safety plan. Specific duties will include:

Approve the selection of the types of personal protective equipment (PPE) to be used on site of specific tasks,

Monitor the compliance activities and the documentation processes undertaken by the Site Safety Officer,

Evaluate weather and chemical hazard information and make recommendations to the Project Manager about any modifications to work plans or personal protection levels in order to maintain safety,

Coordinate upgrading or downgrading PPE with Site Safety Officer, as necessary, due to changes in exposure levels, monitoring results, weather, other site conditions,

Approve all field personnel working on site, taking into consideration their level of safety training, their physical capacity, and their eligibility to wear the protective equipment necessary for their assigned tasks (i.e., Respirator Fit Testing Results), and,

Oversee the air monitoring procedures as they are carried out by site personnel for compliance with all company health and safety policies.

Site Safety Officer

The Site safety Officer shall be responsible for the implementation of the site safety plan on site. Specific duties will include:

Lead and conduct site safety meeting at the beginning of each work day;

Monitor the compliance of field personnel for the routine and proper use of the PPE that has been designated for each task;

Routinely inspect PPE and clothing to ensure that it is in good condition and is being stored and maintained properly;

Stop work on the site or change work assignments or procedures if any operation threatens the health and safety of workers or public;

Monitor personnel who enter and exit the site and all controlled access points;

Report any signs of fatigue, work-related stress, or chemical exposures to the Project Manager and/or Health & Safety Manager;

Dismiss field personnel from the site if their actions or negligence endangers themselves, co-workers, or the public, and report the same to the Project Manager and/or Health & Safety Manager;

Report any accidents or violations of the site safety plan to the Project Manager and/or Health & Safety Manager, and document the same for the project in the project records;

Know emergency procedures, evacuation routes and the telephone numbers of the ambulance, local hospital, poison control center, fire and police departments;

Ensure that all project-related personnel have signed the personnel agreement and acknowledgments from contained in this site safety plan;

Coordinate upgrading and downgrading PPE with the Health & Safety Manager, as necessary, due to changes in exposure levels, monitoring results, weather, and other site conditions; and

Perform air monitoring with approved instruments in accordance with requirements stated in this Site Safety Plan.

XV. AMENDMENTS

Any changes in the scope of work of this project and/or site conditions must be amended in writing on the Site Safety Plan Amendment Sheet (Attachment B) and approved by the Health and Safety Manager.

XVI. EMERGENCY RESPONSE PROCEDURES

In the event of an accident resulting in physical injury, first aid will be administered and the injured worker will be transported to the nearest hospital or emergency medical clinic for emergency treatment. A physician's attention is required regardless of the severity of the injury. The distance to the nearest hospital is 5 miles and the estimated travel time is 15 minutes.

In the event of a fire explosion, or property damage, AllWest will be immediately notified. If necessary, local fire or response agencies will be called.

The CONTRACTOR shall develop a contingency plan which address procedures to be followed in the event of fire, personal accidents and explosions which may result in environmental contamination. The plan shall be reviewed and approved by AllWest before work commences.

EMERGENCY TELEPHONE NUMBERS

Fire and Police:	911
Ambulance:	911

AllWest:	415-391-2510
Contractor:	707-864-2131
Underground Service Alert (USA):	800-422-4133
CHEMTREC:	800-424-9300

Note: Call CHEMTREC only in an emergency. CHEMTREC is an Acronym for Chemical Transportation Emergency Center, a public service of the Chemical Manufacture's Association. CHEMTREC can usually provide hazard information warnings and guidance when given the identification number of the name of the product and the nature of the problem. CHEMTREC can also contact the appropriate experts.

MEDICAL: Alameda Hospital
2070 Clinton Avenue
Alameda, California
(510) 522-3700

XVII. LIMITATIONS AND AUTHORITY STATEMENT

AllWest Environmental does not guarantee the health or safety of any persons entering this site. Due to the potential hazards of this site and the activity occurring thereon, it is not possible to discover, evaluate, and provide protection for all possible hazards which may be encountered. Strict adherence to the HEALTH & SAFETY guidelines set forth herein will reduce, but not eliminate, the potential for injury at this site. The HEALTH & SAFETY guidelines in this plan were prepared specifically for this site and should not be used on any other site without prior research and evaluation by personnel trained in HEALTH & SAFETY practices. The Allwest Project manager will responsible for implementing this plan. Both the AllWest Project Manager and the Health & Safety manager have the authority to audit site activities for compliance with this plan and may suspend, modify or halt contractors' work practices whose conduct does not meet the requirements specific to this plan.

TABLE 1
DEFINITION OF HAZARD EVALUATION GUIDELINES

HAZARD: Airborne Contaminants

Guideline	Explanation
Threshold Limit Value Time-Weighted Average (TLV-TWA)	The time-weighted average concentration for a normal 8-hour work day and a 40-hour work week, to which nearly all workers may be repeatedly exposed without adverse effect.
Permissible Exposure Limit (PEL)	Time-weighted average concentrations similar to (and in many cases derived from) the Threshold Limit Values >
Immediately Dangerous to Life and Health (IDLH)	"IDLH" or "immediately dangerous to life or health" means any atmospheric condition that poses an immediate threat to life, or which is likely to result in acute or immediate severe health effects. This includes oxygen deficiency conditions.

HAZARD: Explosion

Guideline	Explanation
Lower Explosive Limit (LEL)	The minimum concentration of vapor in air below which propagation of a flame will not occur in the presence of an ignition source.
Upper Explosive Limit (UEL)	The maximum concentration of vapor in air above which propagation of a flame will not occur in the presence of an ignition source.

HAZARD: Fire

Guideline	Explanation
Flash Point (flash p)	The lowest temperature at which the vapor of a combustible liquid can be made to ignite momentarily in air.

ATTACHMENT A

AGREEMENT AND ACKNOWLEDGEMENT STATEMENT

Site Health and Safety Plan Agreement

AllWest personnel have the authority to stop work performed by the CONTRACTOR and his subcontractors at this site if any work is not performed in accordance with the requirements of this Site Health and Safety Plan.

AllWest project personnel, contractor and subcontractor personnel are required to sign the following agreement prior to conducting work at the site.

1. I have read and fully understand the Site Health and Safety Plan and my individual responsibilities.

2. I agree to abide by the provisions of the Site Safety Plan.

Name	Signature
Company	Date
Name	Signature
Company	Date
Name	Signature
Company	Date
Name	Signature
Company	Date

ATTACHMENT B

SITE SAFETY PLAN AMENDMENT SHEET

Project Name: _____

Project Number: _____

Location: _____

Changes in field activities or hazards:

Proposed Amendment:

Proposed by: _____ Date: _____

Approved by: _____ Date: _____
Project Manager

_____ Date: _____
Health & Safety Manager

Declined by: _____ Date: _____

Amendment Number: _____

Amendment Effective Date: _____