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93 OCT 22 PM 3:44

October 21, 1993

Mr. Anthony Pettiti
15539 Usher Street
San Lorenzo, CA 94580

RE: Replacement page for Work Plan
Anthony's Auto Service, 19592 Center St., Castro Valley, CA

Dear Mr. Pettiti:

Enclosed, please find the replacement page no. 1 for the Work Plan for sub-surface site investigation. Please replace this page with the original page no.1.

If you have any question regarding this Work Plan, please do not hesitate to contact me.

Sincerely,

Misty Kaltreider

Misty Kaltreider
Geologist

cc: Mr. Scott Seery - Alameda County Health Care Services Agency
Mr. Eddie So - Regional Water Quality Control Board

Encl.

1000 Atlantic Avenue, Suite 110 • Alameda, CA 94501 • (510) 522-8188 • FAX: (510) 865-5731

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93 OCT 20 AM 11:07

October 18, 1993

Mr. Anthony Pettiti
15539 Usher Street
San Lorenzo, CA 94580

RE: Work Plan for Subsurface Site Investigation
Anthony's Auto Service, 19592 Center St., Castro Valley, CA

Dear Mr. Pettiti:

Enclosed, please find the Work Plan for subsurface site investigation, the installation of two additional monitoring wells, and groundwater sampling at Anthony's Auto Service located at 19592 Center Street in Castro Valley, California, per request of Alameda County Health Care Services Agency.

If you have any question regarding this Work Plan, please do not hesitate to contact me.

Sincerely,

Misty Kaltreider
Geologist

cc: Mr. Scott Seery - Alameda County Health Care Services Agency
Mr. Eddie So - Regional Water Quality Control Board

Encl.

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This work plan never implemented

WORK PLAN
SUBSURFACE SITE INVESTIGATION
ANTHONY'S AUTO SERVICE
19592 CENTER STREET
CASTRO VALLEY, CALIFORNIA

Prepared for:

Mr. Anthony Pettiti
15539 Usher Street
San Lorenzo, CA 94580

October 1993

Prepared by:

Misty Kaltreider
Project Geologist

Reviewed by:

Christopher M. Palmer CEG# 1262
Registered Geologist

1000 Atlantic Avenue, Suite 110 • Alameda, CA 94501 • (510) 522-8188 • FAX: (510) 865-5731

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FIGURES

Figure 1: Vicinity Map
Figure 2: Site Plan

APPENDICES

Appendix A: Soil Sampling in Boreholes and During Construction of Monitoring Wells

Appendix B: Well Construction

Appendix C: Water Sampling in Wells and Boreholes

Appendix D: Site Specific Health and Safety Plan

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SUBSURFACE SITE INVESTIGATION - WORK PLAN
ANTHONY'S AUTO SERVICE, 19592 CENTER ST., CASTRO VALLEY, CA

1.0 Introduction

ACC Environmental Consultants, Inc. ("ACC") is pleased to present to Mr. Anthony Pettiti this Work Plan for an additional subsurface site investigation at the site known as Anthony's Auto Service, located at 19592 Center Street in Castro Valley, California (Figure 1). The purpose of this project is to further investigate hydrocarbon impact to soil and groundwater at the site. The investigation includes drilling borings and installing two monitoring wells to evaluate the groundwater plume of volatile hydrocarbons as Total Petroleum Hydrocarbons (TPH) as gasoline and its constituents. The additional monitoring wells will be used to evaluate the extent of groundwater contamination.

2.0 Background

The site has operated as a service station from 1956 to 1986. In 1986 Mr. John Pettiti purchased the property from Mr. Wayne DelRio. The site is currently owned by the Estate of John G. Pettiti.

The former underground storage tanks have been used from 1956 to 1986 to dispense Shell and Texaco gasoline products. Since 1986, Anthony's Auto Service and Trick Racing Gasoline have used the tanks for storage and dispensing of high octane, leaded racing gasoline.

In 1990, Tank Protect Engineering removed three underground gasoline tanks and one underground waste oil tank from the property. Results of soil sample analysis indicated up to 3,200 parts per million (ppm) of Total Petroleum Hydrocarbons (TPH) as gasoline. Results of soil samples collected under the waste oil tank indicated trace amounts of benzene, toluene, ethylbenzene, total xylenes (BTEX) and Chromium, lead, and zinc. No further action was required for soil under the waste oil tank.

Due to the levels of constituents reported, Alameda County Health Care Services Agency (ACHCSA) required further investigation to evaluate the extent of contamination in the soil and groundwater.

Overexcavation activities were performed to remove impacted soil from under the gasoline tanks. Verification soil sampling of the sidewalls and base of the excavation documented residual levels of contaminates had been removed. Approximately 450 cubic yards were removed and remediated on-site. Verification soil samples were collected of the remediated soil which indicated below detectable levels of TPH as gasoline and BTEX. The remediated soil was used as fill material for the excavation.

In March 1991, three monitoring wells were installed on-site (Figure 2). Results of groundwater samples collected from the wells indicated none-gasoline constituents. The groundwater samples were reanalyzed for volatile organics as EPA Test Method 8240 and Open Scan. Analysis results indicated 150 parts per billion (ppb) iso-octane within the groundwater samples collected from monitoring wells MW-1 and MW-3.

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SUBSURFACE SITE INVESTIGATION - WORK PLAN
ANTHONY'S AUTO SERVICE, 19592 CENTER ST., CASTRO VALLEY, CA

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In March 1991, three monitoring wells were installed on-site (Figure 2). Results of groundwater samples collected from the wells indicated none-gasoline constituents. The groundwater samples were reanalyzed for volatile organics as EPA Test Method 8240 and Open Scan. Analysis results indicated 150 parts per billion (ppb) iso-octane within the groundwater samples collected from monitoring wells MW-1 and MW-3.

Groundwater sampling performed in May 1991 indicated below detectable levels of the constituents evaluated. Groundwater sampling conducted in August 1991 indicated monitoring wells MW-2 and MW-3 had been contaminated with a "moisture sensitive paste" used to measure water depth levels.

Groundwater sampling in November 1991 indicated elevated levels of none-gasoline components (gasoline additives) in well MW-3. Laboratory analysis results detected 4.2 ppb 1,2-Dichloroethane, 750 ppb Propane, 2-Methoxy-2-Methyl, 110 ppb Butane, 2,2,3,3-Tetramethyl and 9.6 ppb Hexane, 2,3,4-Tetramethyl. Of the four constituents discovered, only 1,2-Dichloroethane was listed as being above the Department of Health Services (DHS) and Environmental Protection Agency's (EPA) California Maximum Contaminant Levels (MCL) for drinking water (MCL = 0.5 ppb).

Laboratory analysis from groundwater sampling conducted in February 1992 indicated elevated levels of non-gasoline components in monitoring wells MW-1 and MW-3. Analysis indicated the following:

	MW-1	MW-3
2-Methoxy-W-Methyl Propane	140 ppb	120 ppb
2,2,3,3-Tetramethyl Butane	81 ppb	68 ppb
1,1-Dichlorocyclohexane	62 ppb	55 ppb
1-(2-Methoxypropoxy)-2-Propane	150 ppb	130 ppb

Groundwater gradient at the site was reported to flow west/southwest. Due to the elevated levels of fuel-related and solvent compounds reported in the November 1991, and February 1992 sampling events, further investigation is required by ACHCSA (letter dated February 13, 1992.

3.0 SCOPE OF WORK

Two borings will be drilled with a truck-mounted drill rig equipped with eight-inch hollow-stem augers and will be converted into two-inch diameter monitoring wells. The wells will be located southwest downgradient of the existing monitoring wells. The newly installed monitoring wells will be used to evaluate the extent of fuel-related and solvent compounds in the groundwater. Figure 2 illustrates the proposed monitoring well locations.

4.0 DRILLING PROGRAM

Drilling permits will be obtained from the Alameda County Water Conservation and Flood Control District - Zone 7 and Alameda County prior to drilling and sampling activities. The locations of the proposed borings will be marked with white paint. Alameda County Health Care Services Agency and Underground Services Alert (USA) will be notified at least 48 hours prior to commencing work.

During drilling, undisturbed soil samples will be obtained for chemical analyses and geotechnical classification at five-foot intervals, distinct lithologic changes and at the soil/groundwater interface. Sampling will begin at five feet below grade and continue to the bottom of each boring, (Appendix A, "Soil Sampling in Boreholes and During Construction of Monitoring Wells").

A Photoionization detector (PID) will be used to prescreen the soil to be sampled.

Cuttings will be placed in capped drums, labeled and left on-site pending the analytical results.

one would be likely "OK" from capillary zone

Two soil samples per boring will be submitted to a CAL-EPA certified accredited analytical testing laboratory for analysis of Total Petroleum Hydrocarbons as gasoline oil using EPA Test Method 5030 and benzene, toluene, ethylbenzene and total xylenes (BTEX) by EPA Test Method 8020 and volatile organics by EPA Test Method 8240 & "Open Scan".

4.1 Monitoring Well Installation

The total depth of the monitoring wells will be contingent upon lithology and depth to groundwater. It is anticipated that the total depth of the wells will be approximately 40 feet below ground surface. The well installations will be conducted in a manner consistent with Regional Water Quality Control Board requirements (see Appendix B, Well Construction).

The borings for the monitoring wells will be drilled to a depth of 40 feet or the first aquitard below ground surface with a hollow stem auger as groundwater is estimated at 30 to 35 feet during seasonal low periods. The wells will be screened sealed as field conditions dictate, to best meet the Regional Water Quality Control Board guidance.

The two borings will be converted into two-inch monitoring wells. The monitoring wells will be screened with 0.020 slot Schedule 40 PVC from approximately 30 to 40 feet below the ground surface. Packing material consisting of # 2/12 sand will be used as annular fill and will be added from the bottom of the screened depth to at least two feet above the top of the screen. A surface seal consisting of bentonite/volclay grout will be added to the top of the sand pack. The wells will be completed with a traffic safe "Christy" box cemented over the top of each wells.

The specifics of the construction and development of the monitoring wells are discussed in detail in Appendix B, "Well Construction". Per Alameda County's Monitoring Well Guidelines, the wells will not be developed until at least 72 hours have elapsed after completion of construction. Additionally, as specified in Alameda County regulations, the wells will not be sampled until at least 72 hours have elapsed following completion of well development. After development of each well, water samples will be collected and analyzed for Total Petroleum Hydrocarbons as gasoline using EPA Test Method 5030 and benzene, toluene, ethylbenzene and total xylenes (BTEX) by EPA Test Method 602 and volatile organics by EPA Test Method 624 & Open Scan (see Appendix C, Water Sampling in Wells and Boreholes). All purge water generated during the sampling process will be contained on site in DOT-approved 55-gallon drums. Disposal of this purge water will be governed by the laboratory results for the associated water sample.

4.2 Groundwater Monitoring

Subsequent to the installation of the monitoring wells, the newly installed wells will be surveyed to an established benchmark, with an accuracy of 0.01 foot. Groundwater samples will be collected quarterly for a minimum of one year from the newly installed wells and the existing monitoring wells, and submitted to a CAL/EPA analytical laboratory for TPH as gasoline by EPA Test Method 5030 and BTEX by EPA Test Method 602 and volatile organics by EPA Test Method 624 & Open Scan.

Prior to each sampling event, the water level elevation in all the wells will be measured. Samples will be collected, stored, and transported in accordance with existing regulatory guidelines (see Appendix C, "Water Sampling in Wells and Boreholes").

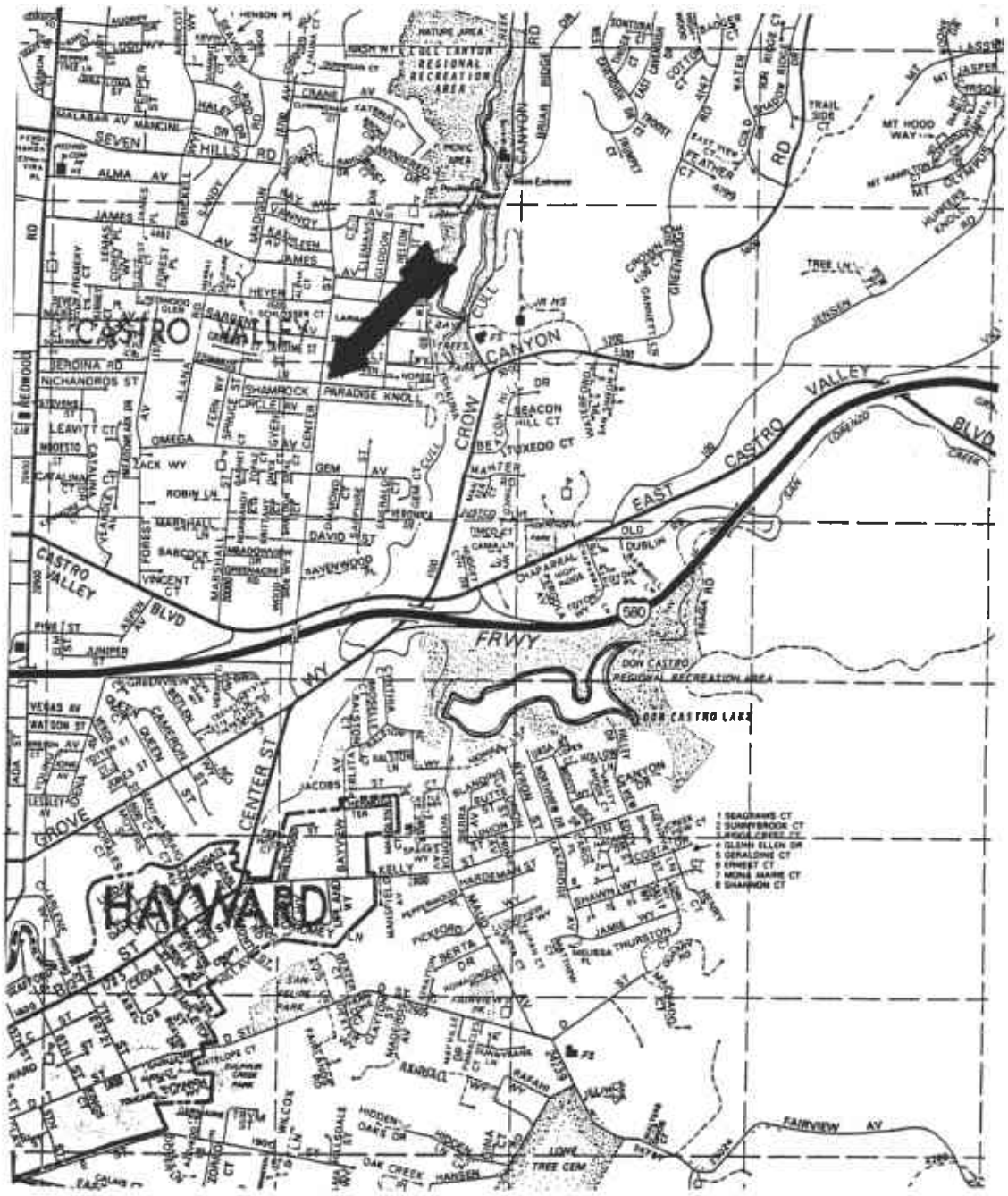
A report containing the analytical results will be submitted to Alameda County Health Care Services Agency and the Regional Water Quality Control Board on a quarterly basis. The quarterly report will also include maps showing the groundwater gradient and analytical findings.

5.0 HEALTH AND SAFETY PLAN

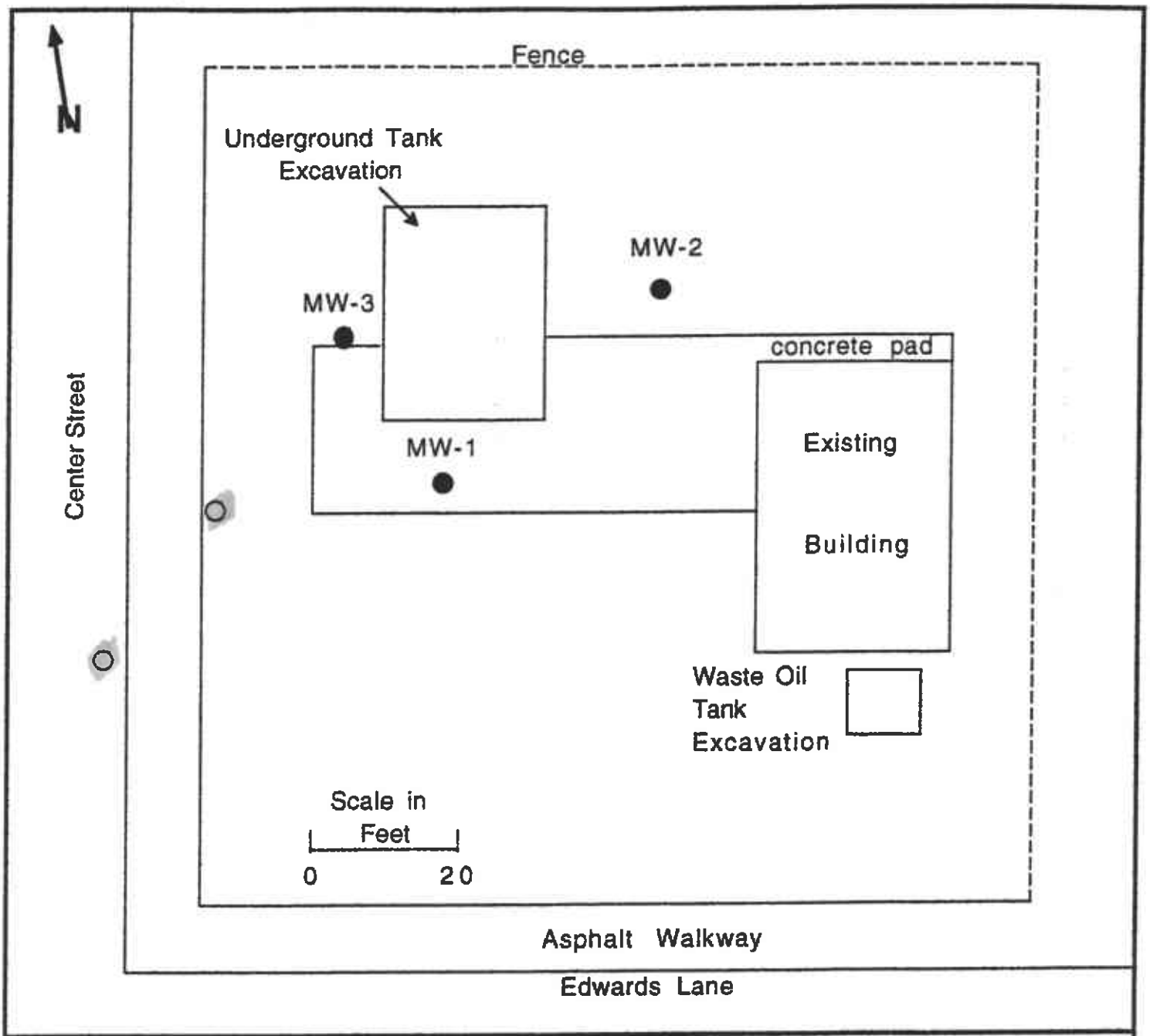
A site health and safety plan which encompasses the proposed work at the site and complies with the requirements of 29 CFR Part 1910.120 is presented in Appendix D.

6.0 TECHNICAL REPORTS

A technical report discussing the subsurface findings and the monitoring well installations and the initial groundwater sampling event at the site will be submitted to the client for review and acknowledgement prior to sending the report to Alameda County Health Care Services Agency and the Regional Water Quality Control Board. Additional reports detailing groundwater monitoring activities and results will be submitted on a quarterly basis thereafter.



ACC Environmental Consultants 1000 Atlantic Avenue, Suite 110 Alameda, CA 94501	Job No.: 6032-1	Location Map
	Date: 10/4/93	Figure No.: 1



LEGEND

MW-1 ● Existing Groundwater Monitoring Well

● Proposed Monitoring Well Location

ACC Environmental Consultants 1000 Atlantic Avenue, Suite 110 Alameda, CA 94501	Job No.: 6032-1	Site Plan Anthony's Auto Service
	Date: 10/4/93	Figure No.: 2

APPENDIX A

SOIL SAMPLING IN BOREHOLES AND DURING CONSTRUCTION OF MONITORING WELLS

SOIL SAMPLING IN BOREHOLES AND DURING CONSTRUCTION OF MONITORING WELLS

U.S. Environmental Protection Agency standards serve as the foundation for all field sampling operations performed by field personnel. EPA SW 846 is the primary publication from which procedures are derived. While some aspects of field and laboratory work may be delegated to the CAL EPA-Department of Toxic Substances Control (DTSC), the Bay Area Regional Water Quality Control Board, and the Health Services Agency - Department of Environmental Health establish the general and specific criteria for sampling.

SAMPLE INTERVALS

Undisturbed soil samples will be obtained for chemical analysis and geotechnical classification at five-foot intervals or at distinct lithologic changes, beginning at five feet below grade.

COLLECTION DEVICES

Samples will be collected using a 2-inch or 2.5-inch inside diameter Modified California Split Spoon Sampler containing three six-inch-long brass tubes or two three-inch-long tubes between two six-inch-long brass tubes. The sample collection device and tubes will be decontaminated before and after each use by steam cleaning or by an Alconox solution wash, tap water rinse and deionized water rinse. The sampler will be driven ahead of the auger using a 140-pound drop hammer. The average blow counts required to drive the sampler the last 18 inches will be recorded on the boring logs.

PRESERVATION AND HANDLING

After collection, sample tubes will be labeled, sealed at each end with Teflon sheeting and PVC end caps, placed in ziplock bags and stored in an ice filled cooler to be delivered under chain-of-custody to a State-certified laboratory by the next business day.

SOILS CLASSIFICATION

Soil exposed at the ends of each brass tube will be examined by a geologist for obvious signs of contamination and classified according to the Unified Soil Classification System. These observations will be recorded in the boring logs.

Selection of samples for laboratory analysis will be based primarily on headspace readings using a Photo ionization device (PID) and position within the boring. In general, samples with headspace readings over 50 ppm or that have visual or olfactory indications of contamination will be submitted for analysis. One sample will also be selected from one or two sampling intervals below the apparent lower limit of contamination to obtain a "zero line" value. In addition, the sample closest to the depth of the storage tank invert will be submitted for analysis. If the water table is above the tank invert, the sample closest to the water table will be selected.

SAMPLE LABELING AND CHAIN OF CUSTODY

Samples selected for analysis will be labeled with self-adhesive, pre-printed labels indicating project name (or number), sample number, boring/well number, sample depth, date and time of sample collection, and required analyses. The same information will be recorded on the chain of custody.

GENERAL PRACTICES

Each monitoring well will be designed to register the potentiometric surface, facilitate soil sampling, and permit water sampling. Enclosed standard procedures for well installation and soil/water sampling meet or exceed guidelines set forth by the EPA, California State Regional Water Quality Control Board, and the Alameda County Department of Environmental Health. Drilling, construction, and completion of all exploratory borings and monitoring well will be in conformance with procedures in this appendix.

DRILLING PROCEDURES

Monitoring wells will be drilled with a hollow-stem, continuous-flight auger. All boring and logging will be supervised by a geologist with special attention given to the avoidance of cross contamination of underlying aquifers. The following procedures used by field geologist prevent pollution of clean aquifers underlying contaminated zones:

1. Drilling will cease if five feet of saturated impermeable material is encountered. It will be assumed that any significant saturated, impermeable layer, such as a clay layer, is an aquitard separating the shallow and deep aquifers and should not be penetrated.

2. Drilling will be terminated 20 feet below any perched or unconfined water table.

3. Drilling will be terminated at 45 feet below ground surface if groundwater is not encountered. This is above nearly all deep aquifers currently supplying groundwater in the Bay Area.

The drill rig operator and field geologist will discuss significant changes in material penetrated by the drill, changes in drilling conditions, hydraulic pressure, and drilling action. The field geologist will be present during the drilling of exploratory borings and will observe and record changes by time and depth, evaluate the relative moisture and content of the samples, and note water producing zones. This record will be used later to prepare a detailed lithologic log. Lithologic descriptions will include soil or rock type, color, grain size, texture, hardness, degree of induration, carbonate content, presence of fossils or other materials (gypsum, hydrocarbons), and other pertinent information. A copy of the logs will be retained in the field file at the project site.

<u>Soil Cuttings</u>

Soil cuttings generated during drilling will be placed in steel, DOT-approved drums. Drums will be labeled as to contents, suspected contaminants, date container filled, expected removal date, company name and phone number of technical contact, and name of generator. Drums will be sealed and left on-site for subsequent disposal pending receipt of analytical results. Disposal of soil cuttings will be the responsibility of the owner/generator, although Consultant may arrange for disposal if so

requested.

SCREEN AND CASING

The monitoring well assembly will consist of new schedule-40 (minimum), flush-threaded, polyvinyl chloride (PVC) casing from the bottom of the boring to the ground surface. Casing will be shipped in protective wrappers.

From the base of the well to approximately five feet above the ground water surface, casing will consist of perforated casing (well screen); the remainder of the well will be solid PVC casing. Perforated casing (well screen) will be factory slotted. Screen sizes are intended to facilitate hydraulic connection between the monitoring well and the surrounding aquifer while retaining 70 to 90% of the filter pack material.

Upon completion of drilling, well casing will be assembled and lowered to the bottom of the boring. Since using glue to connect casing sections could cause false analytical interpretations of water quality, the casing will be connected with dry threads or slip joints. The bottom of the casing will be approximately flush with the bottom of the boring and will be capped with a threaded PVC cap or plug. Using the lithologic log for control, the field geologist will specify the exact depths of screened intervals so that the well screen is approximately opposite the water-bearing zone to be monitored.

Where possible, the casing will extend six inches above the ground surface. When monitoring wells are placed in traffic areas where the wells cannot extend above the surface, locking, pre-cast concrete or cast iron boxes and covers will be installed.

FILTER PACK

After the monitoring well assembly has been lowered to the specified depth, filter pack will be placed in the annular space between the well casing and borehole from the bottom of the well to approximately two feet above the top of the well screen. The depth to the top of the filter pack will be verified using the tremie pipe or a weighted steel tape. Filter pack will be at least 95% silica sand. Sand will be hard, durable, well-rounded, spherical grains that have been washed until free of dust and contamination.

American Society for Testing and Materials (ASTM) recommends the following guidelines for screen slot size and filter pack selection based on the anticipated underlying material:

Anticipated Soil Type	Recommended Well Screen Slot Size (inches)	Recommended Filter Pack Material (U.S. sieve sizes)
Sand & Gravel	0.030	20 to 4
Silt & Sand	0.020	30 to 8
Clay & Silt	0.010	50 to 16

Reference: Development Methods for Water Wells: An Anthology: NWWA Water Well Journal, June 1988.

GROUT SEAL

A layer of bentonite pellets approximately one foot thick will be placed above the filter pack and charged with water. The depth to the top of the bentonite pellets layer will be verified using the tremie pipe or a weighted steel tape.

A cement-bentonite grout mixture will be tremied into the annular space from the bentonite seal to the top of the well. The grout material will be a mixture of Portland Type I/II cement (94 lb.) to five gallons of clean water or a sand-cement slurry with a minimum of 11 sacks of portland Type I/II cement per cubic yard. Only clean water from a municipal supply shall be used to prepare the grout. Well development will not begin until the grout has set for a minimum of 72 hours.

CAPPING WELLS

Following well construction, a steel or pre-cast concrete wall vault (or valve box) will be installed below ground surface. A metal tag containing well number and construction data will be permanently attached to the well vault. A steel well cover clearly marked "monitoring well" will be bolted to the vault. A suitable watertight, locking well cap will be fitted to the riser casing to prevent the entry of surface runoff or foreign matter.

WELL DEVELOPMENT

When well installation is complete, the well will be developed by surging, and/or bailing, and/or pumping to remove fines from the formation and filter pack. Well development generally restores natural hydraulic properties to the adjacent soils and improves hydraulic properties near the borehole so the water flows more freely in the well. At least three well volumes casing volumes will be removed from the wells. There are at least two common methods for determining that water in casing storage has been removed and water is flowing freely from the aquifer: (1) Monitor water level while pumping. When the pumping water level has "stabilized," it is likely that little or no water from casing storage is being pumped. (2) Monitor the temperature, pH and conductivity of the water while pumping. When these parameters "stabilize," it is probable that little or no water from casing storage is being pumped and that most of the water is coming from the aquifer. Field personnel will use the latter method. During development, pH, specific conductance, and temperature of the return water from the water pump will be measured. Well development will proceed until these field-measured water quality parameters have stabilized and the water is, in the judgement of the geologist, at its greatest possible clarity.

Temperature, pH and specific conductance meters will be calibrated per manufacturer's guidelines. Calibration shall be documented in the field log book or data sheets and will include a description of the calibration method, identification number of equipment, and/or reagents used in calibration.

Temperature will be measured with a mercury-filled, Centigrade-scaled, bimetallic-element thermometer, or electronic thermistor. pH measurements will be made shortly after collection of the sample, preferably within a few minutes.

Conductivity will be measured by dipping the conductivity probe in the water source or sample. The probe must be immersed above the vent. The temperature of the sample will be used to calculate specific conductance from the conductivity measurement. Conductivity will be reported in units of micromhos per centimeter (mmho/cm) at 25°C.

WELL PURGING AND WATER SAMPLING

Purging and sampling will not begin for at least 72 hours following construction to allow grout to set. Purging and sampling will be in accordance with procedures in Appendix D, Water Sampling in Wells, and Boreholes.

DOCUMENTATION

A well construction diagram for each monitoring well will be completed by the geologist and submitted to the project manager when the work has been completed. In addition, the details of well installation, construction, development, and field measurements of water quality parameters will be summarized as daily entries in a field notebook or data sheets which will be submitted to the project manager when the work has been completed.

DRILLING EQUIPMENT DECONTAMINATION PROCEDURES

The sampler and liners will be decontaminated before and after each use by steam cleaning or washing in an Alconox solution, followed by tap water and deionized water rinses. Only clean water from a municipal supply will be used for decontamination of drilling equipment. Sampler and liners will be sealed in plastic bags or other sealed containers to prevent contact with solvents, dust or other contamination.

All rinsate used in the decontamination process will be stored on site in steel DOT approved drums. Drums will be labeled as to contents, suspected contaminants, date container was filled, expected removal date, company name, contact and phone number. These drums will be sealed and left on-site for subsequent disposal pending receipt of analytical results.

APPENDIX C

WATER SAMPLING IN WELLS AND BOREHOLES

GENERAL CONSIDERATIONS

In general, the composition of water within the well casing and in close proximity to the well is not representative of groundwater quality. This may be due to contamination by drilling fluids or equipment or disparities between the oxidation-reduction (redox) potential in the well and the redox potential in the aquifer. To obtain a representative sample of groundwater, the well should be pumped or bailed until the well is thoroughly flushed of standing water and contains fresh water from the aquifer. One common procedure is to pump or bail the well until a minimum of three boring volumes (or alternatively, 10 well volumes) have been removed.

At the least, pumping should continue until water in casing storage has been removed. There are at least two common methods for determining that water in casing storage has been removed and water is flowing freely from the aquifer: (1) Monitor water level while pumping. When the pumping water level has "stabilized," it is likely that little or no water from casing storage is being pumped. (2) Monitor the temperature, pH and conductivity of the water while pumping. When these parameters "stabilize," it is probable that little or no water from casing storage is being pumped and that most of the water is coming from the aquifer. Field personnel will utilize the latter method.

PURGING

During each round of sampling, static water level will be measured prior to purging using an electronic sounder. All water-level measurements will be recorded to the nearest 0.01 foot with respect to mean sea level.

A minimum of three bore volumes will be purged from the well prior to sampling. Bore and well volumes will be calculated using the table in this Appendix. To ensure that water in the well has been exchanged, pumping or bailing shall commence at the top and work downward. The well will be allowed to return to 80% of the original water level before sampling.

Temperature, pH and specific conductance will be measured for each boring volume pumped. Purging will continue until these field-measured water quality parameters have stabilized and the water is, in the judgment of the geologist, representative of water in the aquifer. Data obtained from field water quality measurements will be recorded in the field log book or data sheets. To ensure cross contamination does not occur, a separate allotment of groundwater collected from the purge water outlet stream will be used for field measurements; samples intended for laboratory analysis will not be used.

Temperature, pH and specific conductance meters will be calibrated per manufactures guidelines. Calibration will be documented in the field log book or data sheets and will include a description of the calibration method, identification number of equipment, and/or reagents used in calibration.

VOLUME OF WATER IN CASING OR HOLE

Diameter of Casing or Hole (inches)	Gallons per foot of Depth	Cubic Feet per foot of Depth	Liters per Meter of Depth	Cubic Meters per Meter of Depth
1	0.041	0.0055	0.509	0.509×10^{-3}
1.5	0.092	0.0123	1.142	1.142×10^{-3}
2	0.163	0.0218	2.024	2.024×10^{-3}
2.5	0.255	0.341	3.167	3.167×10^{-3}
3	0.367	0.0491	4.558	4.558×10^{-3}
3.5	0.500	0.0668	6.209	6.209×10^{-3}
4	0.653	0.0873	8.110	8.110×10^{-3}
4.5	0.826	0.1104	10.26	10.26×10^{-3}
5	1.020	0.1364	12.67	12.67×10^{-3}
5.5	1.234	0.1650	15.33	15.33×10^{-3}
6	1.469	0.1963	18.24	18.24×10^{-3}
7	2.000	0.2673	24.84	24.84×10^{-3}
8	2.611	0.3491	32.43	32.43×10^{-3}
9	3.305	0.4418	41.04	41.04×10^{-3}
10	4.080	0.5454	50.67	50.67×10^{-3}
11	4.937	0.6600	61.31	61.31×10^{-3}
12	5.875	0.7854	72.96	72.96×10^{-3}
14	8.000	1.069	99.35	99.35×10^{-3}
16	10.44	1.396	129.65	129.65×10^{-3}
18	13.22	1.767	164.18	164.18×10^{-3}
20	16.32	2.182	202.68	202.68×10^{-3}
22	19.75	2.640	245.28	245.28×10^{-3}
24	23.50	3.142	291.85	291.85×10^{-3}
26	27.58	3.687	342.52	342.52×10^{-3}
28	32.00	4.276	397.41	397.41×10^{-3}
30	36.72	4.909	456.02	456.02×10^{-3}
32	41.78	5.585	518.87	518.87×10^{-3}
34	47.16	6.305	585.68	585.68×10^{-3}
36	52.88	7.069	656.72	656.72×10^{-3}

1 Gallon = 3.785 Liters
1 Meter = 3.281 Feet
1 Gallon Water Weighs 8.33 lbs. = 3.785 Kilograms
1 Liter Water Weighs 1 Kilogram = 2.205 lbs.

Temperature will be measured with a mercury-filled, Centigrade-scaled, bimetallic-element thermometer, or electronic thermistor.

Acidity/alkalinity (pH) will be measured by dipping the pH probe in the water source or sample; pH will be measured soon after collection of the sample, preferably within a few minutes.

Conductivity will be measured by dipping the conductivity probe in the water source or sample. The temperature of the sample will be used to calculate specific conductance from the conductivity measurement. Measurements shall be reported in units of micromhos per centimeter at 25°C.

SAMPLE COLLECTION

Wells and borings will be sampled using a new, clean, disposable Teflon bailer attached to new, clean string. Sample vials and bottles will be filled to overflowing and sealed so that no air is trapped in the vial or bottle. Once filled, samples shall be inverted and tapped to test for air bubbles. Samples will be contained in vials and bottles approved by the US EPA and the Regional Water Quality Control Board. Some analyses may require separate sample containers in accordance with EPA methods described in 40 CFR Part 136 and SW-846.

Water samples intended for volatile hydrocarbon analysis (EPA Method 602) will be contained in 40 ml VOA vials and will contain a small amount of preservative (HCl) in the vial. Samples intended for analysis by EPA Method 601 and EPA 624 GCMS procedures will not be preserved. Water samples intended for low level diesel analysis will be stored in amber glass 1-liter bottles to reduce degradation by sunlight. Antimicrobial preservative (HCl) may be added to the sample if a prolonged holding time is expected prior to analysis.

Sample containers will be labeled with self-adhesive, pre-printed tags. Labels will contain the following information in waterproof ink:

- Project number (or name)
- Sample number (or name)
- Sample location (Well number, etc.)
- Date and time samples were collected
- Treatment (preservative added, filtered, etc.)
- Name of sample collector

All samples will stored in ice filled coolers to be delivered to an EPA/CAL accredited laboratory for analysis.

All purged water will be stored on site in steel, DOT-approved drums. Drums will be labeled as to contents, suspected contaminants, date container filled, expected removal date, company name, contact and phone number. The drums will be left on-site for subsequent disposal pending receipt of analytical results.

DOCUMENTATION

Sampling information will be recorded in ink in a bound notebook with consecutively numbered pages. Pages will not be removed for any reason. Alternatively, specially formatted field data sheets may be used to record the information collected during water quality sampling. Errata may be marked out with a single line and initialed by the person making the change. The log book and data sheets will be placed in the project file when sampling is completed.

FIELD EQUIPMENT DECONTAMINATION PROCEDURES

Bailers and string will be properly decontaminated and disposed of off-site. All other sampling equipment, such as buckets and stands, will be decontaminated after each use by washing in an Alconox solution, followed by tap water and deionized water rinses. Equipment will be sealed in plastic bags or sealed containers to prevent contact with solvents, dusts, or other types of contamination.

All rinsate used in the decontamination process will be stored on site in steel DOT-approved drums. Drums will be labeled as to contents, suspected contaminants, date container filled, expected removal date, company name, contact and phone number. These drums will be sealed and left on-site for subsequent disposal pending receipt of analytical results.

APPENDIX D

SITE SPECIFIC
HEALTH AND SAFETY PLAN

ACC

SITE SAFETY PLAN

A. GENERAL INFORMATION

Project Title: **Anthony's Auto Service**

Project No.: **6032-1**

Project Manager: **Misty Kaltreider**

Location: **19592 Center Street, Castro Valley, California**

Prepared by/date: **Misty Kaltreider**

Approved by/date: _____

Scope of
Work/Objective(s): **Soil Borings, installation of monitoring wells**

Proposed Date of Field Activities: _____

Documentation/Summary:

Overall Chemical Hazard:	Serious	[ ]	Moderate	[ ]
	Low	[X]	Unknown	[ ]
Overall Physical Hazard:	Serious	[ ]	Moderate	[X]
	Low	[ ]	Unknown	[ ]

- -

B. SITE/WASTE CHARACTERISTICS

Waste Types(s):

Liquid [X] Solid [X] Sludge [ ] Gas/Vapor [X]

Characteristics:

Flammable/ Ignitible	[X]	Volatile	[X]	Corrosive	[ ]	Acutely Toxic	[ ]
Explosive	[ ]	Reactive	[ ]	Carcinogen	[X]	Radio-active	[ ]

Other: _____

Physical Hazards:

Overhead [ ] Confined Space [ ] Below Grade [ ] Trip/ Fall [X]

Puncture [ ] Burn [ ] Cut [X] Splash [X] Noise [X]

Other: **Hazards with Drilling**

Site History/Description and Unusual Features:
Drilling and Sampling within the Vicinity of former Tank Excavation.

Locations of Chemicals/Waste: **In soil and water**

Estimated Volume of Chemicals/Waste: **Unknown**

Site Currently in Operation: Yes [X] No [ ]

- -

C. HAZARD EVALUATION

List and Evaluate Hazards By Task (ie. sampling/ drilling)

Physical Hazard Evaluation	Anticipated Level of Protection
Task 1. **Drilling**	**D**
Task 2. **Sampling**	**D**
Task 3. **Installing Monitoring Well**	**D**
Task 4. **Groundwater Sampling**	**D**

Modifications: _____

Chemical Hazard Evaluation:

Compound	PEL/TWA	Route of Exposure	Acute Symptoms	Odor Threshold/Desc.
gasoline Volatile Organics	**300 ppm**	**inhalation dermal, ingestion**	**skin blisters, nausea, central nervous system disorder**	**Characteristic odor**

D. SITE SAFETY AND WORK PLAN

Site Control: Attach map of the site.

Perimeter identified? [Y] Site secured? [Y] Work areas identified? [Y]

Zone(s) of contamination identified? [N]

Air Monitoring:

Contaminant of Interest	Type of Sample	Monitoring Equipment	Frequency of Sampling
Gasoline	**air**	**HNu**	**Continous - as needed**
VOC	**air**	**HNu**	**Continous - as needed**

Decontamination procedures and solutions:

Tri-sodium phosphate and water, triple rinsed

Special Site Equipment: (Sanitary facilities, lighting, etc)

None anticipated

Site Entry Procedures and Special Considerations

Underground Services Alert (USA) notified to avoid underground utilities

Work Limitations (time of day, weather conditions, etc.)

None anticipated

General Spill Control, if applicable: **N/A**

Investigation-Derived Material Disposal (expendables, cuttings, etc.)

Drum cuttings and rinsate water in covered, labeled 55-gallon DOT certified drums.

Sample Handling Procedures:

Soil samples collected in brass tubes, teflon tape and plastic end caps taped to each end. All samples will be placed in ice-filled coolers until pick-up by laboratory.

E. EMERGENCY INFORMATION

Ambulance **911**

Hospital Emergency Room **(510) 538-6464**

Directions to Hospital (attach map) **Laurel Grove Hospital - 19933 Lake Chabot Road**

Poison Control Center **911**

Police **911**

Fire Department **911**

Laboratory **ChromaLab Analytical**

UPS/Fed. Express **N/A**

Client Contact **Mr. Anthony Pettiti (510) 538-1288**

Site Contact **Mr. Anthony Pettiti (510) 538-1288**

SITE RESOURCES

Water Supply Source **On-site**

Telephone **On-site**

Cellular Phone, if available ---

Other ---

EQUIPMENT CHECKLIST

Protective Gear	Quantity	Instrumentation	Quantity
Respirator	[1]	O2/Explosimeter	[ ]
Cartridges(**organic**)	[2]	PID (HNu)	[1]
Protective Suit type: **Tyvek**	[1]	Draeger Pump (tubes)	[ ]
Gloves (pr) type: **Nitrile**	[1]	Heat Stress Monitor	[ ]
Steel Toed Boots	[1]	Personal Sampling Pumps	[ ]

Hard Hat	[1]
Safety Glasses	[1]
Ear Plugs	[1]

First Aid Equipment	Quantity
First Aid Kit	[X]
Portable eye wash	[ ]
Blood pressure monitor	[ ]
Fire extinguisher	[ ]

Miscellaneous	Quantity
Surveyor's tape	[1]
Fiberglass tape	[ ]
Rope/string (100')	[3]
Surveying Flags	[ ]
Camera/film	[1]
Banner tape (active site)	[X]
Coolers	[1]
Teflon tape (roll)	[1]
Bottle labels (set)	[1]
Baggies (set)	[1]
Custody seals	[ ]
Chain of custody forms	[1]
Federal Express forms	[ ]
Bubble wrap	[ ]
Trash bags	[1]
Paper towels (roll)	[1]
Detergent/TSP (box)	[1]
Buckets	[3]
Brushes	[2]

Sampling Equipment	Quantity
Liter bottles	[6]
Half gallon bottles	[ ]
VOA bottles	[6]
String	[ ]
Hand bailers	[3]
Spoons	[ ]
Personal sampling pump supplies	[ ]
Shovel	[ ]

SITE SAFETY REVIEW

General Information

Date _____ Time _____ Project No. **6122-1**

Site **Anthony's Auto Service**

Location **19592 Center Street, Castro Valley**

Client Contact **Mr. Anthony Pettiti (510) 538-1288**

Objectives **Soil Borings, installing monitoring wells**

Types of Chemicals Anticipated **Gasoline, Volatile Organics**

Topics Discussed

Physical Hazards **Typical Hazards associated with drilling**

Chemical Hazards **Gasoline, Volatile Organics**

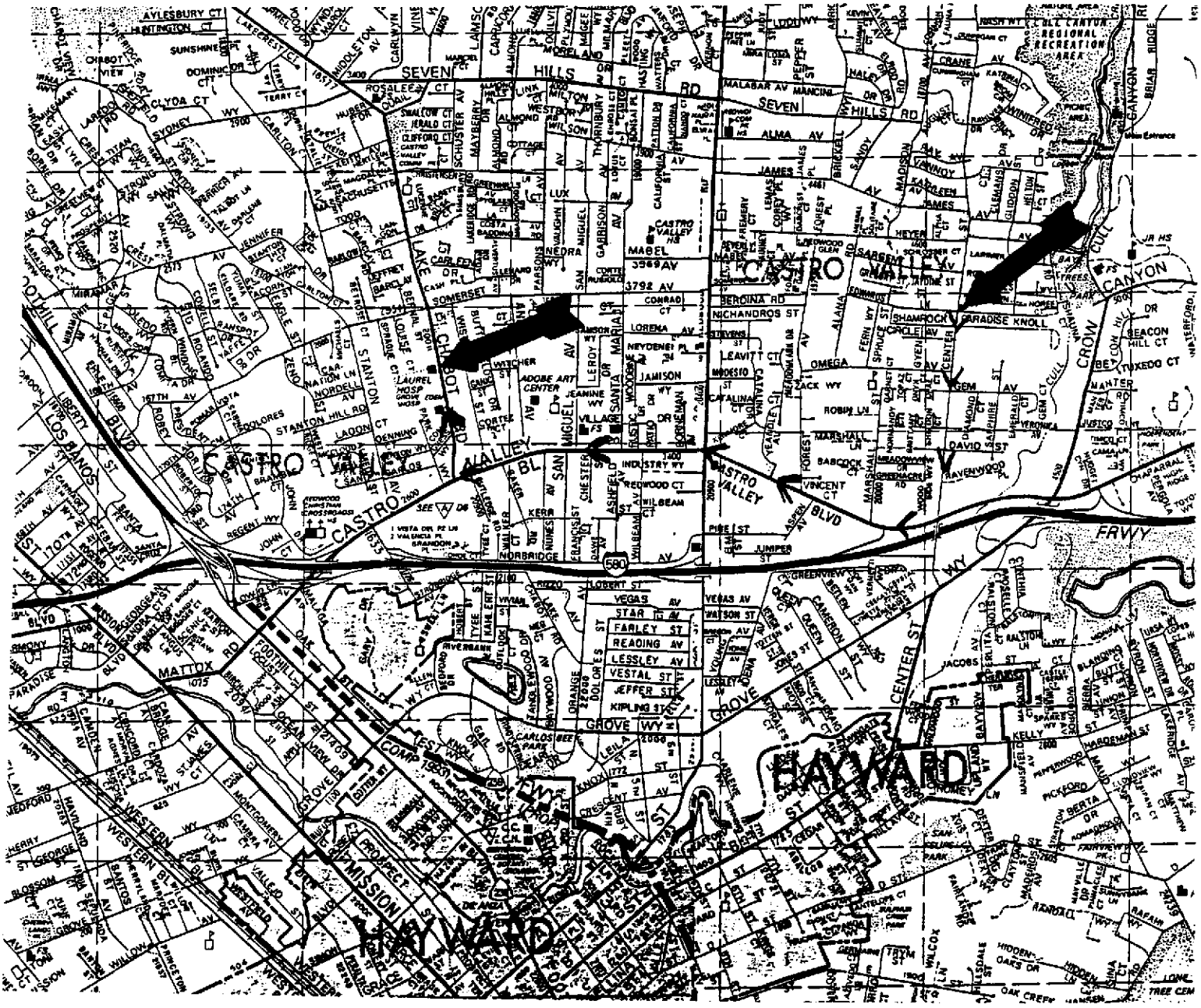
Personal Protection **Level D, modified as required**

Decontamination **Equipment to be decontaminated after each boring. Rinsate water will be drumed**

Special Site Considerations **None anticipated**

ATTENDEES

Name Printed	Signature



HOSPITAL LOCATION MAP