SITE CHARACTERIZATION WORK PLAN
FOR EXCAVATED FUEL TANK AREA
CARNATION'S DAIRY FACILITY
1310 14TH STREET
OAKLAND, ALAMEDA COUNTY, CALIFORNIA

AGE PROJECT No. 004-88-059

February 13, 1989

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Mr. Howard R. Shmuckler, Carnation Corporate Counsel, authorized Anania Geologic Engineering (AGE) to perform a site characterization to determine the lateral and vertical extent of contamination associated with the former fuel and waste oil tanks at the facility. Five underground storage tanks were removed in early January. Analytical results and conditions observed during the excavation indicate the presence of floating product on the groundwater and high levels of diesel and gasoline contamination in the soil. The purpose of the site characterization is to determine the extent of contamination and the aquifer characteristics of the uppermost aquifer on the Carnation facility. The Alameda County Health Department, Hazardous Materials Division is the lead regulatory agency.

1.1 PURPOSE

The site characterization described in this work plan has the following objectives:

1) Determine the lateral and vertical extent of fuel contamination in the soil and groundwater on the facility by sampling the soil and groundwater.

2) Determine the thickness and lateral extent of free product floating on the groundwater surrounding the former tank area.

3) Determine the lithology and lateral extent of stratigraphic units in the excavated tank area to a maximum depth of 20 feet.

4) Determine the aquifer characteristics in the area surrounding the tank excavation.

1.2 SCOPE OF WORK

The scope of services described in this work plan include:

1) Locate underground utilities on the facility.

2) Review Regional Water Quality Control Board (RWQCB) and local water planning district files for any available water depth, gradient, and tidal fluctuation information for the area.

3) Continuously core or sample two borings at the southern and eastern ends of the property (Figure 1) for subsurface stratigraphic information. Borings will be advanced to a depth of 20 feet or no more than two feet into a clay layer, whichever comes first. If the lithology for both borings are similar, no more stratigraphic borings will be drilled. If the stratigraphy varies greatly, a third stratigraphic boring will be drilled west of the former tank locations. The final decision will be made in the field.

4) Collect soil samples at five foot intervals and changes in lithology using correct sampling protocol and chain of custody procedures.

5) Analyze all soil samples for total petroleum hydrocarbons (TPH), benzene, toluene, ethyl benzene and xylenes (BTEX) using EPA methods 8015 Modified and 8020. Analyze all soil samples for TTLC lead by ICAP or total organic lead using an approved method. Analyze selected samples for fats, oil and grease.

6) Analyze selected samples for methylene blue active substances (MBAS) to determine presence and concentration of soaps. Analysis will be performed onsite because it is not a DOHS certified analysis.

7) Construct monitoring wells in the stratigraphic borings with schedule 40 PVC screen and casing as shown on Figures 2 and 3. Well screen size will be #20 slot and packed with #2-12 clean sand to two feet above the well screen if no floating product is encountered during drilling. If floating product is encountered, schedule 80 PVC well screen with hand cut vertical slots will be installed and packed with #3 clean Monterey sand to two feet above the well screen.

8) Advance up to thirteen more borings and convert to 4-inch monitoring wells to define lateral and vertical extent of contamination. A maximum of 15 wells will be drilled

in this investigation. Tentative monitoring well locations are shown on Figure 1.

9) Construct monitoring wells in additional borings as described for the stratigraphic borings in section 1.2.7.

10) Develop wells by blowing them out with nitrogen and/or surge block method to remove the fines and set the filter pack. Well development will not begin until the well seals have been allowed to set for at least 24 to 48 hours.

11) Allow monitoring wells to equilibrate for at least 48 hours prior to sampling.

12) Measure groundwater levels in all monitoring wells. A Datalogger with a downhole pressure transducer may be installed in some of the wells to record groundwater fluctuations and tidal influences.

13) Measure the thickness of the floating product, if present, in each of the wells. Measurements will be accomplished by one or more of the following devices: an optical probe, interface tape, or oil and gas indicator paste. A pilot test will be performed using each of the above methods to ensure that accurate measurements can be obtained. The test will be performed in a clear tube or sealed well section with a known thickness of floating product on the water column. If any method does not produce accurate and repeatable results, the method will not be used to measure floating product in the monitoring wells.

14) Collect groundwater samples from each of the wells using a teflon bailer a minimum of once a month for the first three months and at least quarterly for the period of one year. Three to five well volumes of water will be purged with a peristaltic pump or bailer prior to sampling. Temperature, pH and conductivity will be monitored during purging. The samples will be collected in appropriate containers provided by the analyzing laboratory. Water samples will be placed in a cooler with blue ice at a temperature of approximately 4 degrees Centigrade and transported to the laboratory at the end of each day under chain of custody.

15) Analyze the water samples for TPH and BTEX using EPA methods 8015 Modified and 8020 and TTLC lead or total organic lead by ICP or an approved method. Selected samples may be analyzed for total fats, oil and grease.

16) Survey the location and elevation of each of the monitoring wells to the nearest tenth of a foot for location and nearest hundredth of a foot for elevation. Elevations will be measured with respect to mean sea level using an established USGS marker or equivalent.

17) Determine aquifer characteristics onsite, including groundwater gradient and velocity.

18) Prepare a written report detailing the field procedures, monitoring well installation and construction, analytical results, site characteristics, interpretations, conclusions, and recommendations for the next phase of work.

1.3 SCHEDULE

AGE anticipates starting work described in this work plan in early March 1989 or sooner, if possible, pending approval from the County. The stratigraphic borings will be drilled first. If analytical results are not available within a few days, drilling may move to one or more of the four borings to be drilled in the boiler fuel tank area, providing approval for this work has been granted by the County. (Work plan for monitoring well installation for the boiler fuel tanks is being submitted as a separate document.) Drilling for the remaining monitoring wells will not begin until the stratigraphic borings have been completed, unless access to the stratigraphic holes is not available.

Well development and sampling of completed wells will be performed concurrently with the installation of the remaining wells. It is estimated that completion of the drilling, well installation, well development, and initial sampling will be completed four to six weeks after the initiation of work. Factors affecting this schedule include availability of the drilling rig, permitting and inspection requirements, turnaround time on the analytical results, access to drilling locations, and coordination with the plant manager to minimize the impact of field operations on plant operations.

A factual report of findings described in Item 18 of Section 1.2 above will be submitted within a month of receipt of analytical results for the soil and groundwater samples. This report will describe the drilling operations, well installation, well development, soil and groundwater sampling protocol, conclusions, and recommendations for the next phase of work, including future groundwater sampling and water level monitoring schedules. Also included will be the interpretation of hydrogeologic data within the constraints of the scope of work. Groundwater gradient, groundwater fluctuations, and free product thicknesses and elevations will be included. Plume definition as best as can be determined from this scope of work will be addressed. Geologic cross-sections across the site will be constructed based on data from the

borings. Boring logs for each of the borings, chain of custody forms, and analytical results will be incorporated in the report. If this initial phase of work is delayed, an interim status report may be submitted.

2.0 BACKGROUND

Carnation's dairy facility, shown on Figure 4, is located at 1310 14th Street in the City of Oakland and covers two square blocks south of 14th Street, north of 16th Street, east of Interstate 880, and west of Poplar Street.

2.1 FACILITY DESCRIPTION

The facility is an active ice cream and milk production plant with associated packaging, storage and distribution operations. Access onsite is often restricted due to the large volume of truck traffic. A large portion of the paved areas are occupied by delivery trucks beginning in the middle of the afternoon. Electrical outlets are located in each parking stall to connect to the refrigerated compartments for the delivery trucks. A large warehouse with several service bays occupies the northwest corner of the facility. The five underground storage tanks associated with this work plan were located south of the east wing of this building. Figure 1 shows the western half of the facility. The facility had seven underground fuel storage tanks. This work plan addresses the site characterization and extent of contamination in the area of the four fuel tanks and one waste oil tank. The two remaining tanks that contain boiler fuel in the eastern part of the facility are not addressed in this work plan.

2.2 FACILITY HISTORY

The dairy facility was originally owned by American Creamery and was constructed in 1915. Carnation purchased the facility in 1929. Several additions and improvements to the buildings were made between 1946 and 1973 to meet changing operation requirements. Carnation is currently negotiating the sale of the property and existing facilities with Foster Farms.

2.3 PROJECT HISTORY

Four fuel tanks and one waste oil tank, which were located in the northwestern part of the facility, were removed in January 1989. Free product was observed in the excavation pit of the fuel tanks. Two 10,000 gallon tanks stored gasoline and two 12,000 gallon tanks stored diesel fuel. The tanks were steel and did not have any visible holes upon removal. The soil under the product lines

was stained and strongly suggest leaking pipelines as the source of the contamination. The waste oil tank had a capacity of 1,000 gallons and had visible holes.

Excavated, contaminated soil has been stockpiled on-site and covered with plastic. Detergent from sodium nitroltriaceate (a biodegradable type) from truck-washing operations at the Facility entered the soil and groundwater through the leaky and plugged trench drain, shown on Figure 1. The drain crosses the product lines, which leaked, dissolving the spilled gasoline and diesel into the groundwater. As part of the emergency spill containment measures, bench tests and field performance tests of bioremediation techniques have revealed that the detergent will biodegrade. Twelve-inch PVC recovery wells/sumps with 1/8-inch vertical slots have been installed in rock drain recovery trenches in the tank and waste oil excavations. Product has been recovered from the well/sumps with a product skimmer system and carbon polishers on the vents.

3.0 WORK PLAN

AGE proposes to characterize the site in the vicinity of the excavated underground tanks and determine the lateral and vertical extent of the contamination. The proposed area of investigation for this scope of work is the western half of the facility. The northern, western and southern property boundaries will be the limits of the investigation on three sides. The eastern limit will be the north-south trending utility lines which bisect the property. These utilities used to be located in the middle of a City street which has since been closed and incorporated in the facility.

The lithology in the area will be determined by two to three continuously cored stratigraphic test borings advanced to depths of approximately 20 feet. Soil samples will be collected at five foot intervals and at any changes in lithology. The samples will be analyzed for TPH, BTEX and TTLC lead or total organic lead. Selected samples may be analyzed for total fats, oil and grease. The stratigraphic borings will be converted to 4-inch monitoring wells. Up to fourteen 4-inch monitoring wells will then be installed for a total of fifteen monitoring wells in this phase of work. Each well will be sampled, and the water will be analyzed for TPH, BTEX, and TTLC lead or total organic lead. Total fats, oil and grease may be analyzed for selected wells. Water levels will be measured at least once a month for the first three months. A Datalogger equipped with a transducer may be installed in some of the wells to keep a continuous record of water levels and to determine tidal fluctuations.

3.1 SOIL BORINGS DEPTH AND LOCATIONS

Soil borings will be drilled to depths of approximately 20 feet or no greater than 2 feet into a clay layer, if clay is encountered prior to reaching 20 feet. Soil samples will be collected at 5-foot intervals in each boring. Additional samples will collected in the stratigraphic test borings at changes in lithology. Soil samples for analyses will not be collected at depths below the water table. However, an attempt will be made to obtain a soil sample just above the soil-water interface.

The proposed boring locations are shown on Figure 1. These locations are subject to revisions based on access, degree of contamination encountered in previous borings, impact from concurrent removal of free product as an emergency measure, and restrictions to work areas due to plant operations. The locations have been selected to provide what are hoped to be upgradient and downgradient sampling points as well as plume definition on the property. The borehole drilling sequence is designed to utilize the information from previous borings to gain the most information in this initial phase of work. Preliminary assumptions used in preparing this work plan are the following; groundwater flows to the west, a clay layer is present between 13 and 15 feet below ground surface, water level is between 9 and 12 feet below ground surface, and the water level fluctuates due to tidal influences. The purpose of the stratigraphic borings is to provide background levels in the soil (if one of the borings is "clean") and to give accurate depths, thicknesses, and lateral extent of the stratigraphic units in the uppermost 20 feet.

The first stratigraphic test hole is hoped to be a "clean" boring and will provide background levels in addition to the stratigraphic information. It will be drilled at the southern edge of the facility, west of the former street and associated utilities. The boring will not be advanced through the clay layer anticipated at approximately 13 feet below ground surface until analytical results can confirm the soil is not contaminated. The soil samples will be submitted on a 24-hour rush in order to keep the drilling down time to a minimum. If this boring is not "clean", the boring will not be advanced any further and a monitoring well will be installed. If analytical results show the soil to be "clean," the boring will be advanced to a total depth of 20 feet to determine the thickness of the clay unit.

The second stratigraphic boring will be continuously cored in the area east of the former fuel tanks, but west of the utility trenches in the former street. If the lithology varies greatly between these first two borings, a third stratigraphic test boring will be drilled to the west or northwest of the tank excavation. The same procedures described above with respect to extending the boring through the clay layer will be followed for all stratigraphic borings.

The remaining borings will be drilled with a continuous flight, hollow stem auger. The drilling sequence of the remaining borings/wells will be determined in the field based on analytical results from previous borings, access, and limitations or restrictions from plant operations. The borings will be drilled in an order such that the plume can be defined and still not impede the facility's operation to the greatest extent possible. If necessary, drilling may shift to the boiler fuel tank area if progress on the site characterization is delayed for some reason. Although the site characterization and drilling borings and sampling for the boiler fuel tanks are considered separate projects and are described under separate work plans, the work may be completed concurrently rather than subsequently. Additionally, work for the boiler fuel tanks will not begin until a work plan has been approved.

3.2 MONITORING WELL INSTALLATION AND CONSTRUCTION

Groundwater monitoring wells will be installed in all fifteen of the borings. The borings will be completed as four-inch monitoring wells. The well design is based on the following assumptions; groundwater level is between nine and twelve feet, groundwater flow direction is to the west, groundwater levels fluctuate from tidal influences, and a confining or semi-confining layer is expected at approximately 15 feet below ground surface. Additionally, floating product is expected to be encountered in some and possibly all of the wells.

The monitoring wells will be completed to depths of between 15 and 20 feet. Based on the assumption of the presence of a clay layer, the wells will most likely be only 15 feet deep. The well will be screened to one or two feet above the highest water level. For planning purposes, this level is estimated to seven or eight feet below ground surface. The filter pack will extend to one to two feet above the well screen. A bentonite seal two feet thick will be placed above the filter pack. A bentonite-cement slurry will be placed as the surface seal. The wells will be flush mounted and capped with a water tight cap and covered with a locking well case. The surface will be finished to allow drainage away from the well head. Construction details are shown on Figures 2 and 3. If floating product is encountered in the boring, the well will be completed as shown in Figure 2 with vertical slots cut into schedule 80 PVC and packed with clean #3 sand. If floating product was not encountered during drilling, the well will be constructed as shown in Figure 3. These wells will have schedule 40 PVC with #20 slot screen set with clean #2-12 Monterey sand. All monitoring wells will have a PVC bottom cap.

3.3 WATER LEVEL MEASUREMENTS

Water level measurements will be taken in all of the monitoring wells at least once a month. In one or several of the monitoring wells, a Datalogger with a transducer may be installed to measure water levels. The continuous monitoring of water levels can provide the information to determine the tidal influences. Additionally, the tidal fluctuation data can be used to determine the aquifer characteristics necessary to design a remediation system. Recommendations for the frequency of taking water level measurements at the site will be included in the final or an interim status report. This scope of work covers only the well installation and initial sampling.

4.0 METHODS

The methods employed to implement the above scope of work are described in this section.

4.1 BORING METHODS

The stratigraphic test holes will be continuously cored using an appropriate rig. After coring, the hole will be reamed with a continuous-flight auger to a diameter of 10 inches. Continuous soil samples will be collected in a 2-inch core barrel in accordance with ASTM Method D 1587-83, Standard Practice for Thin-walled Tube Sampling of Soils. The core barrel and drillpipe will be steam cleaned prior to each boring. No soap will be used for steam cleaning so as not to introduce additional soaps or phosphates into the soil or groundwater. The lithology, soil classification and other pertinent data will be recorded on a field boring log and in a bound numbered notebook in accordance with ASTM Method D 2488-84 for visual description and identification of soils. The core will be wrapped in plastic and stored onsite for future reference. Once it has been determined that the core is no longer needed, it will be placed in the stockpiled soil pile and later treated onsite if contaminated.

The remaining twelve to fourteen soil borings will be advanced using an appropriate rig with a 10-inch or larger hollow-stem continuous-flight auger in accordance with ASTM Method D 1452-80, Standard Practice for Soil Investigations and Sampling by Auger Borings. The auger and associated drilling equipment will be steam cleaned prior to drilling each boring. The lithology, soil classification and other pertinent data will be recorded on a field log and in a field notebook as described above. Cuttings and spoils from the borings will be placed in barrels or stockpiled onsite for later onsite bioremediation treatment. If it is necessary to backfill any boring, this will be accomplished by pouring a bentonite cement slurry into the hole.

4.2 SOIL SAMPLING

Soil samples will be collected using a split spoon sampler lined with three 2-inch-diameter brass sleeves driven by a 140-pound hammer with a 30-inch drop. The sampling will be done in accordance with ASTM Methods D 1586-84, Standard Method for Penetration Test and Split-Barrel Sampling of Soil and D 1587-83, Standard Practice for Thin-Walled Tube Sampling of Soils. The brass sleeves and sampler will be steam cleaned prior to each use.

Soil samples will be collected at depths of 5, 10, 15, and 20 feet in each boring unless groundwater is encountered or the onsite geologist selects different sampling depths based on field observations. No soil samples shall be taken below the water table. If possible, a soil sample will be taken at the soil-water interface if the water level is above 20 feet. The blow counts, recovery and lithology will be recorded on the field boring logs and in bound notebooks with numbered pages. Lithology will be described in accordance with ASTM procedure D 2488-84 (Standard Practice for Description and Identification of Soils). The bottom brass sleeve of the three in the sampler will be sent for analyses. The middle brass tube will be used for logging the boring and taking a headspace reading. The top brass sleeve is intended to catch the soil falling back into the borehole.

The bottom brass tube, to be sent to the laboratory for analyses, will be capped with a tight fitting plastic cap and sealed with duct tape. A sample tag with a unique sample number, project number, date, time, sampler number, sample location and depth will be attached to each soil sample. The sample will then be put in a ziplock bag and immediately placed in a cooler with blue ice at a temperature of approximately 4 degrees Centigrade or less. Each sample will be recorded on chain of custody form and in the field notebook. All samples will be transported to Precision Analytical Laboratories, a California DHS certified laboratory, at the end of each work day for analyses.

4.3 FIELD SCREENING OF SOIL SAMPLES

Soil samples will be collected using three 6-inch brass tubes installed inside a split spoon sampler. The bottom tube will be immediately capped and sealed as described above in preparation for transport to the laboratory for analyses. The middle tube will be used for lithologic description and field screening. The top tube will be used for backup if necessary. A vapor reading in parts per million will be taken with the Bacharach TLV Sniffer which is calibrated to hexane. The reading will be noted on the boring log and in the field notebook.

4.4 SOIL ANALYSES

The soil samples will be analyzed by Precision Analytical Laboratories in Richmond, a California State certified laboratory, in accordance with DOHS guidelines and EPA protocols. All samples will be analyzed for TPH, BTEX, and TTLC lead (or total organic lead) by methods 8015 Modified, 8020 and ICAP. Selected samples will be analyzed for fats, oil and grease.

Selected soil samples will be analyzed onsite for methylene blue active substances (MBAS). Samples analyzed for MBAS will be taken from the middle brass sleeve and not from any of the samples sent to the laboratory. The MBAS analyses will performed by AGE personnel using a Hatch kit. The analysis is not a method which the DOHS certifies.

4.5 WELL INSTALLATION

The monitoring wells will be flush mounted and installed immediately after the borings have been advanced to total depth. The PVC well screen and casing will be placed inside the auger. Using the auger, the filter pack will be poured slowly between the outside of the well casing and the inside of the auger to a height of one to two feet above the well screen. The bentonite seal will be constructed by pouring bentonite pellets over the filter pack and then charging the bentonite with distilled water. A bentonite cement slurry with approximately 4% bentonite will be used for the surface seal. The surface seals will be placed in each of the completed wells at the end of the day. The Alameda County Flood Control District will be notified when the surface seals will be placed so an inspector can witness the seal if necessary. The surface will be finished such that the ground slopes away from the well casing to prevent surface runoff into the well. The top of the casing will be capped, and a water-tight locking well box will be installed. A padlock will be placed on the well box to prevent tampering with the well. The well will be labeled and a Water Well Drillers Report will be filed with both the California Department of Water Resources and Alameda County.

4.6 WELL DEVELOPMENT

The wells will be developed after the seals have been allowed to set for at least 48 hours. Well development will be accomplished by blowing out the wells with nitrogen. This method should be the most efficient way to remove the fines and set the filter pack. If this method does not prove to be efficient, the wells will be developed by removing four to ten well volumes of water using the surge block method. All water and materials brought to the surface during the well development will be placed in barrels and later treated in the onsite bioremediation treatment area.

4.7 WATER LEVEL MEASUREMENTS

The well will be allowed to sit and equilibrate for at least 48 hours before the water level will be measured. Water level will be measured with a Soliquest water meter prior to sampling the groundwater in each well. Water level measurements including the date, time, equipment used and the person(s) performing the measurement will be recorded in the bound field notebook.

A Datalogger with a transducer may be installed at one or more of the monitoring wells to continuously record water level measurements. The continuous record will provide a record of the tidal influences as well provide data necessary to calculate the aquifer characteristics.

4.8 WATER SAMPLING

An initial water sample will be collected through the auger after drilling in each of the borings for visual inspection. Another water sample will be collected after each monitoring well has been installed. Groundwater will be sampled for a minimum of three consecutive months after well installation and then quarterly for the remainder of the year. Sampling frequency beyond this scope will be addressed in the final report for this scope of work.

If present, the free product floating on the groundwater surface will be measured using one or more of the following devices: an optical probe, interface tape, or oil and gas indicator paste. A pilot test will be performed using each of the above methods to ensure accurate measurements can be obtained. The test will be performed in a clear tube or sealed well section with a known thickness of floating product on the water column. If any method does not produce accurate and repeatable results, the method will not be used to measure floating product in the monitoring wells. The free product level and thickness will be measured after allowing the well to equilibrate at least 48 hours after well development.

A groundwater sample will be collected from each of the wells using a dedicated teflon bailer. The well will be purged a minimum of three to five well volumes using a peristaltic pump or bailer. The field parameters (pH, conductivity, and temperature) will be monitored and recorded in the field notebook. If possible, the sample will be collected when the field parameters have stabilized. If the well recovery is very slow, the sample will be collected as soon as the water level is sufficient to recover a representative sample. Dedicated bailers will be used to reduce the risk of cross-contamination.

The samples will be collected in appropriate containers supplied by the analyzing laboratory. Samples to be analyzed for volatiles will be collected in VOA vials and filled completely so there is no headspace. The samples will be sealed, labeled with a sample tag stating the unique sample number, project number, date, time, sampler number, and sample location. The sample will be placed in a cooler with blue ice at a temperature of approximately 4 degrees Centigrade or less. Caution will be taken to prevent the coolers from becoming too cold and breaking the glass sample containers. All samples will be recorded on a chain of custody form and in the field notebook. All samples will be transported to Precision Laboratories, a California certified laboratory, for analyses at the end of each work day.

4.9 WATER ANALYSES

The water samples will be analyzed by Precision Analytical Laboratories in Richmond, a California State certified laboratory, in accordance with DOHS guidelines and EPA protocols. All samples will be analyzed for TPH and BTEX using methods 8015 Modified and 8020. Selected samples will be analyzed for TTLC lead by ICAP and fats, oil and grease.

Selected water samples will be analyzed onsite for methylene blue active substances (MBAS). Additional sample containers will be filled for samples analyzed for MBAS rather than using portions of the samples to be sent to the laboratory. The MBAS analyses will performed by AGE personnel onsite using a Hatch kit. It should be noted that the analysis is not a method which the DOHS certifies.

5.0 QUALITY ASSURANCE PLAN

This section describes field and analytical quality assurance procedures to be followed during the investigation and remediation.

5.1 SAMPLE COLLECTION AND HANDLING PROTOCOL

Proper sample collection and handling are essential to assure quality of data obtained from a sample. Therefore, each sample will be collected in an appropriate container, preserved correctly for the intended analysis, and stored for no longer than the permissible holding time prior to analysis. Protocol to be applied in this project is described in section 4.

5.2 SAMPLE IDENTIFICATION AND CHAIN OF CUSTODY PROTOCOL

Sample identification and chain of custody procedures are designed to assure sample quality and to document sample possession from the

time it is collected to the time of its ultimate disposal. The container for each sample submitted for analysis will have a label affixed with the identifying number or the number will be inscribed directly on the container if feasible. The analytical laboratory will assign a separate sample number unique to that sample for internal sample coordination and identification. A description of the sample, including the sample number and other pertinent information regarding its collection and/or geologic significance, will be written in field notes and on the geologic boring log being prepared by the site geologist. These field documents will be kept in a permanent project file. All samples will be analyzed by a state certified laboratory for the analyses requested.

A properly completed chain of custody form will be submitted to the analytical laboratory along with the samples. The laboratory's assigned number will be properly entered on the form. A quality control officer at the lab will verify the integrity of samples submitted, proper sample volume, correctness of containers used, and properly executed chain of custody form. Pertinent information will be entered into a log book kept by the laboratory.

5.3 ANALYTICAL QUALITY ASSURANCE

In addition to routine calibration of analytical instruments with standards and blanks, the analyst is required to run duplicates and spikes on 10 percent of analyses to assure an added measure of reliability and precision. Accuracy is verified through the following:

1) U.S. EPA and State certification of results;

2) Participation in inter-laboratory round robin program;

3) "Blind" samples are submitted for analysis by the quality control officer on a weekly basis. These are prepared from National Bureau of Standards specifications or EPA reference standards; and

4) Verification of results with an alternative method.

6.0 REMARKS AND SIGNATURES

This work plan was prepared in accordance with current industry standards and practice. The work described herein will be performed under the supervision of a California Registered Geologist.

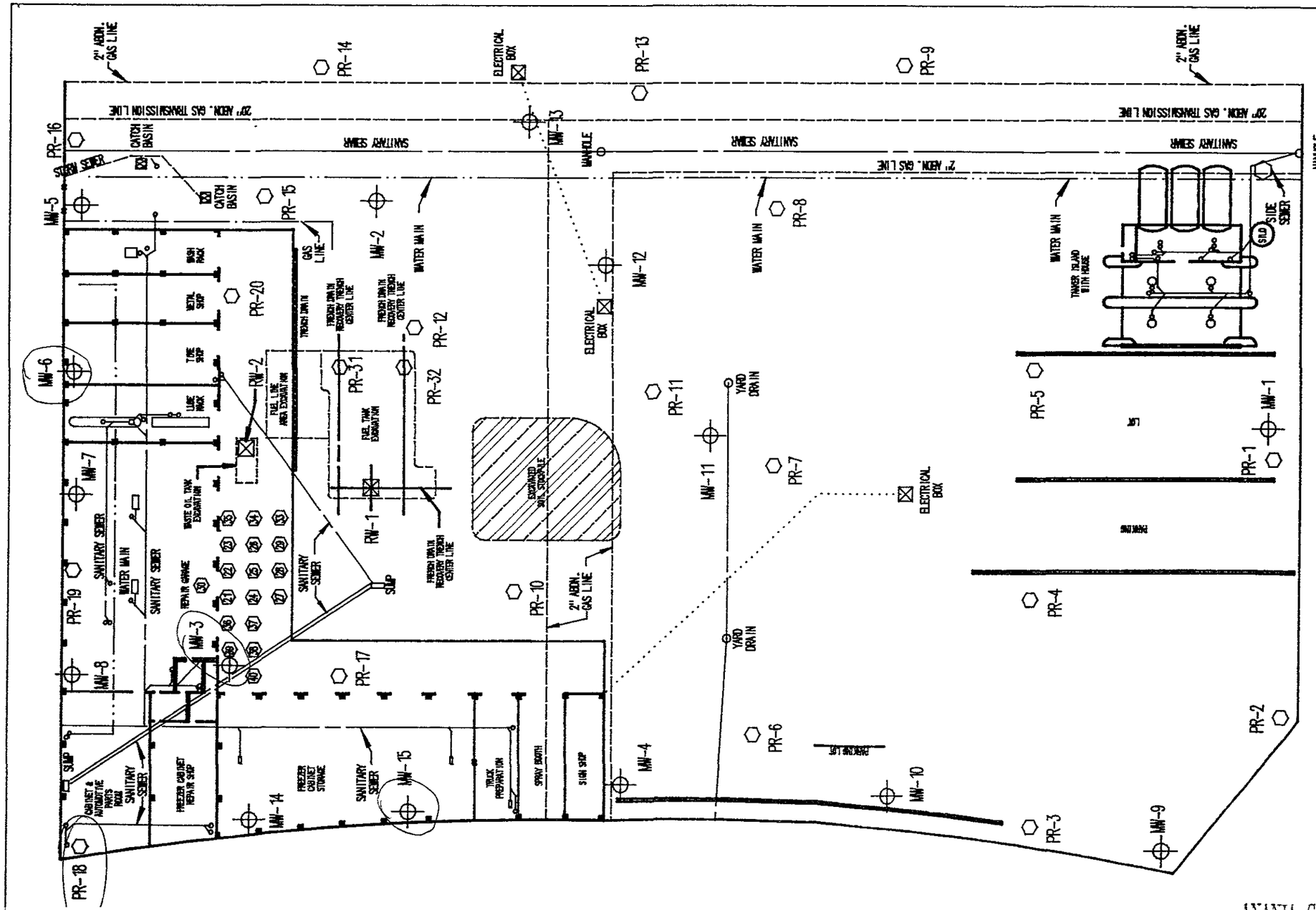
Prepared by: Mary L. Scruggs — Date: 2/13/89

Mary L. Scruggs
Project Manager

Approved by: Karl J. Anania — Date: 2-13-89

Karl J. Anania
California Registered Geologist
No. 4306

FIGURE 1



N

0 21 42

LEGEND

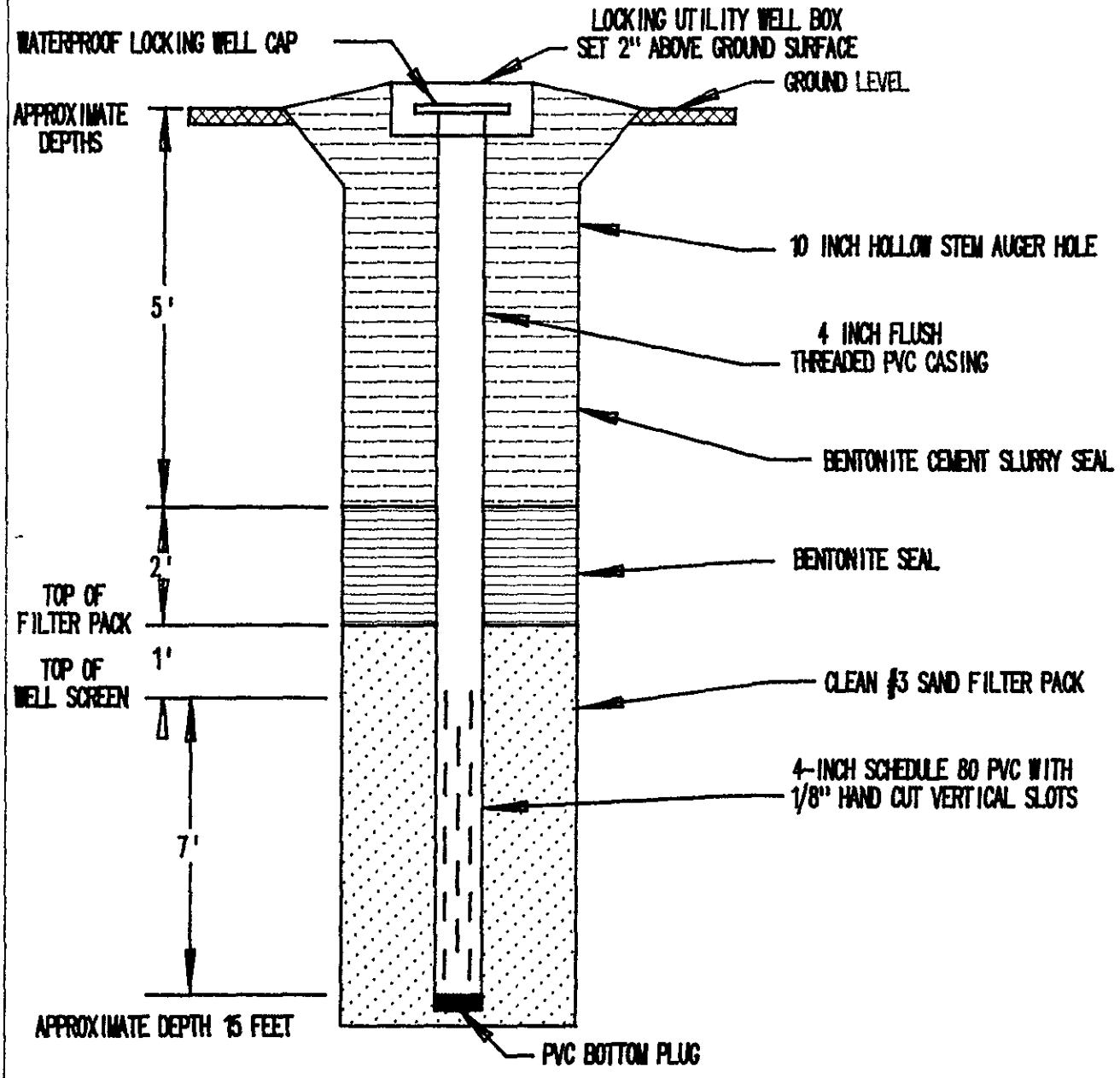
RECOVERY WELL	⊠ RW-1
PRODUCT RECOVERY POINT	⬡ PR-1
PROPOSED MONITORING WELL	⊕ MW-1

AGE

ANANIA GEOLOGIC ENGINEERING

TITLE: PROJECT BORING LOCATIONS					
PROJECT NAME: CARNATION/OAKLAND				PROJECT NO:	004-88-059
SITE LOCATION: 1310 14TH ST. AT POPLAR OAKLAND, CA.					
REV.	DATE	DRAWING BY	CHECKED BY	APPROVED BY	SCALE
	3-14-89	C.DIDIO			

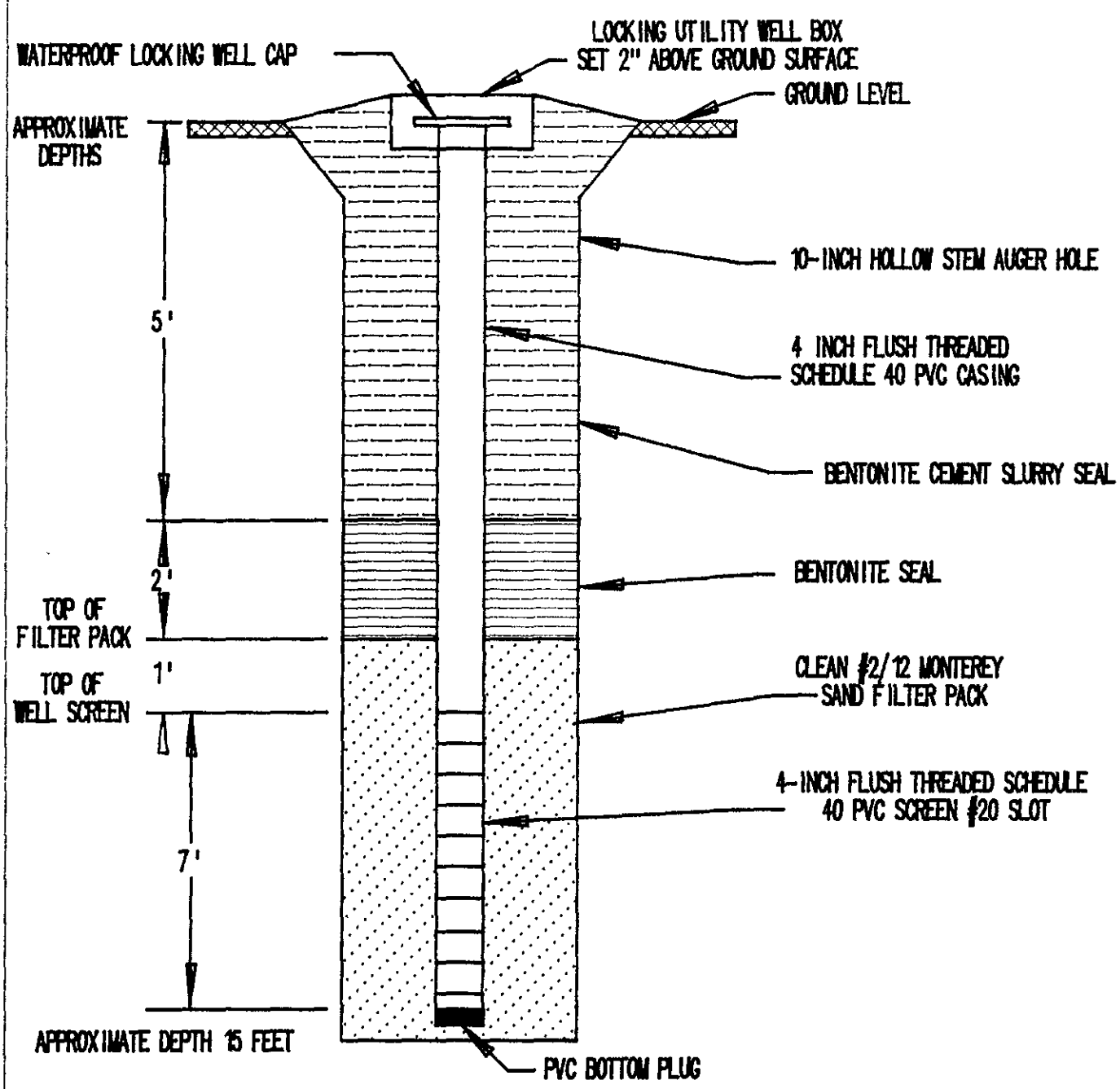
FIGURE 2



AGE
ANANIA GEOLOGIC ENGINEERING

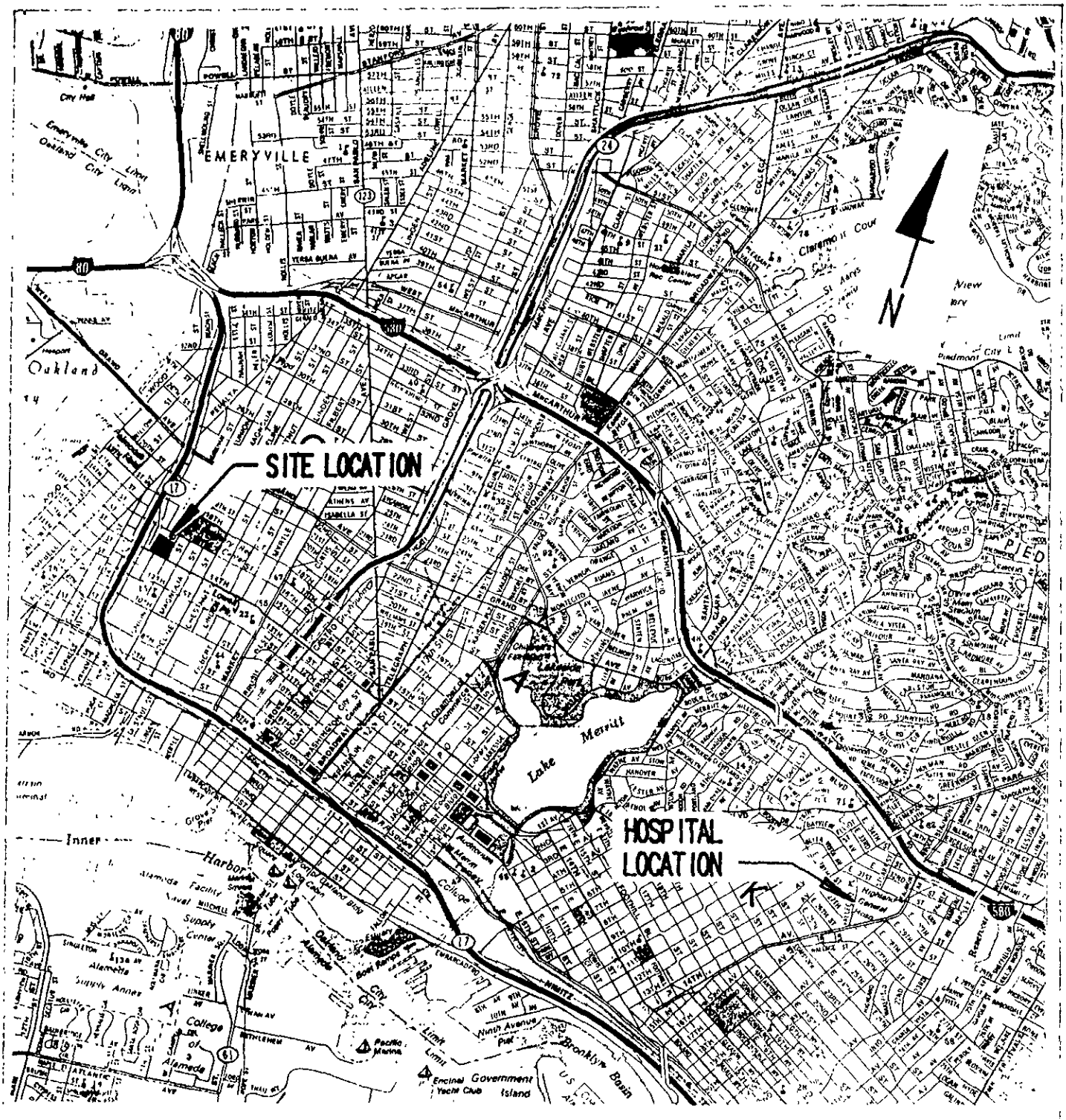
TITLE: MONITORING WELL CONSTRUCTION DETAIL- WELL WITH FLOATING PRODUCT					
PROJECT NAME: CARNATION/OAKLAND				PROJECT NO: 004-88-059	
SITE LOCATION: 1310 14th ST. AT POPLAR ST. OAKLAND					
REV.	DATE	DRAWING BY	CHECKED BY	APPROVED BY	SCALE
	1-30-89	CHRIS DIDIO			NONE

FIGURE 3



AGE
ANANIA GEOLOGIC ENGINEERING

TITLE: MONITORING WELL CONSTRUCTION DETAIL- WELL WITHOUT FLOATING PRODUCT					
PROJECT NAME: CARNATION/OAKLAND				PROJECT NO: 004-88-059	
SITE LOCATION: 1310 14th ST. AT POPLAR ST. OAKLAND					
REV. NO.	DATE	DRAWING BY	CHECKED BY	APPROVED BY	SCALE
	1-30-89	CHRIS DIDIO			NONE



AGE
ANANIA GEOLOGIC ENGINEERING

TITLE: SITE LOCATION MAP					
PROJECT NAME: CARNATION/OAKLAND				PROJECT NO: 004-88-059	
SITE LOCATION: 1310 14th ST. AT POPLAR ST. OAKLAND					
FIG. NO.	DATE	DRAWING BY	CHECKED BY	APPROVED BY	SCALE
4	2-13-89	CHRIS DIDIO			NONE

APPENDIX A

Site Safety Plan

APPENDIX A

**SITE SAFETY PLAN
FOR REMEDIATION/INVESTIGATION
AT THE OAKLAND DAIRIES FACILITY
LOCATED AT 1310 14TH STREET
OAKLAND, CALIFORNIA**

AGE Project No. 004-88-059/060

February 13, 1989

INTRODUCTION

Anania Geologic Engineering (AGE) is performing work at the Oakland Dairies Facility (Facility), at the above address, for the purpose of recovering and remediating the spilled fuel (gasoline and diesel) and investigating the horizontal and vertical extent of fuel contaminants beneath the Facility.

Fuel leaks associated with the former gasoline and diesel underground storage tanks at the Oakland Dairies Facility (Facility) at the above address resulted in free floating gasoline and diesel accumulating on the shallow groundwater in the vicinity of the former tanks. The fuel mixture is very flammable. **FAILURE TO SAFEGUARD AGAINST STATIC SPARK, OPEN FLAME, HEAT OR IMPROPER VENTILATION COULD RESULT IN EXPLOSION AND/OR FIRE, CAUSING SEVERE PERSONAL INJURY OR DEATH AND/OR PROPERTY DAMAGE.**

This Site Safety Plan (SSP) has been written to address safety provisions needed to conduct assessment and remediation work at the Facility. Its purpose is to alert all workers to the hazards and provide established procedures to protect all on-site personnel from:

1) Direct skin contact, inhalation, or ingestion of potentially hazardous materials that may be encountered at the Facility including lead and volatile fuel constituents such as benzene (a known carcinogen)

2) Fire and/or explosion

3) Biological hazards associated with rancid fat, oil and grease

This SSP establishes personnel responsibilities, personal protective equipment standards, decontamination procedures, and emergency

action plans. The means for protecting all on-site personnel from deleterious contamination or personal injury while conducting on-site activities are described below.

SITE BACKGROUND

This Facility is an ice cream production plant, refrigerated storage facility, and truck distribution center located at 1310 14th Street, Oakland, California. In 1989, the four fuel tanks and one waste oil tank were excavated and removed. Free fuel product in the form of mixed gas and diesel has been detected in the soil and on and in the groundwater. Up to 2 feet of free floating fuel product has been measured floating on the shallow groundwater at a depth of less than 10 feet. Analysis of groundwater samples revealed presence of (1) detergents which emulsified the gas and diesel into the groundwater and (2) chelated lead. Fat, oil and grease (FOG) and ammonia from plant operations are also present in the soil and groundwater from an old sewer crossing the Facility.

RESPONSIBILITIES OF KEY PERSONNEL

All personnel on-site will have assigned responsibilities. Karl J. Anania, a California Registered Geologist, will act as Responsible Professional. Mary L. Scruggs will act as Quality Assurance and Quality Control (QA/QC) Officer. Thomas E. Edwards will serve as Senior Project Manager, Site Safety Officer (SSO), and Site Safety Inspector (SSI). Should Mr. Edwards be absent, Eric J. Holm will be the alternate SSO and Jim Perry will be the alternate SSI. In the absence of all the above-named individuals, the senior AGE employee present will act as SSO and SSI.

The SSO will assure that all on-site personnel have received a copy of the SSP and understand it. Before anyone begins work at the site, the SSO will conduct a training session to assure that all are aware of safe work practices. In the training session, personnel will especially be made aware of those site hazards concerning fire and explosion associated with gasoline and diesel vapors/fumes and will utilize Material Safety Data Sheets for information on compounds to be encountered. All on-site workers will be required to document their full understanding of the SSP before admission to the site or starting work by signing they have read the SSP and/or understand it. Worker compliance with the SSP will be monitored at all times by the SSO.

The SSO will ensure proper care is exercised and safe procedures are practiced by all on-site personnel. The appropriate personnel protective equipment listed below will be available and it will be utilized as described below by all on-site personnel.

The SSI will inspect and document all equipment is properly installed and working prior to its operation. Special care will be taken to insure there are no leaks in lines used to pump fuel. All equipment will be checked for proper grounding to prevent static discharge and explosion, and vapors will not improperly be released to the air or allowed to accumulate. Operational procedures used by on-site personnel will be regularly checked and evaluated to prevent potentially hazardous situations from occurring.

All on-site employees will take reasonable precautions to avoid fire and explosion or unforeseen hazards. After documenting full understanding of the SSP, each on-site employee will be responsible for strict adherence to all points contained herein. Any deviation observed or unsafe practice will be reported to the SSO and corrected. On-site employees are held responsible to perform only those tasks for which they believe they are qualified and in their opinion are safe.

The QA/QC Officer will be responsible for regularly evaluating site safety procedures and ensuring the SSO and SSI (or their alternates) are properly performing their duties. In any situation where an unsafe practice or failure to perform is noted by the QA/QC Officer, the circumstances will be immediately reported to the Responsible Professional for corrective action.

Provisions of this SSP are mandatory. All personnel associated with on-site activities will adhere strictly to these provisions, or disciplinary action will be taken. The primary responsibility for safety lies with each individual.

EMERGENCY RESPONSE

Prior to starting any significant or potentially hazardous activities the SSO will notify the Fire Department and Police, and provide them with any information requested. In the event of an emergency or in any situation of potential endangerment to the public, the SSO or ranking person on-site will immediately notify the proper civil authorities. This includes both the Fire Department and Police. The SSO will relinquish his or her authority to the situation commander designated by the Fire Department or the Police. Upon request by that authority, the SSO will then stand by to assist the civil authorities in whatever way possible.

An emergency or potential danger to the public could include but is not limited to any situation described as follows:

1) A death or serious personal injury such as profuse bleeding, asphyxiation, unconscious personnel, third degree burns, extensive second degree burns, or broken bones.

2) A person down in a confined space. (NOTE: Under no circumstances is anyone to enter the confined space to render assistance until properly equipped qualified personnel arrive.)

3) Any fires or uncontrolled flames within 100 feet of any above-ground storage tanks containing recovered fuel or any part of the recovery system with flowing fuel such as suction or discharge lines and pumps.

4) A spill of flammable liquid in excess of 25 gallons in the immediate vicinity of any above ground fuel storage tanks, or lines or equipment used to pump whether or not it is contained.

5) Leaks in any transporting lines or in any tank containing product that can not immediately be shut off and repaired.

6) Any flammable product spill that can not easily be contained or could potentially migrate off-site.

In certain cases where it is deemed prudent, injured personnel should be placed in a vehicle and immediately transported to the nearest emergency hospital.

DESIGNATED AREAS

The SSO will designate certain areas as safe, hazardous, or for special uses. Safe areas will be strategically located around the site. They will be free of any possible combustion sources and have emergency supplies such as fire extinguishers, fire blankets, first aid kits, extra vapor mask filter, clean protective gear, and other rescue equipment. Hazardous areas are described below as Exclusion Zones. Special use zones will be designated for personal cleanup, conferring, eating, and smoking. Smoking outside an area designated for smoking will result in disciplinary action. Smoking within 50 feet of any part of the free fuel product recovery system, especially above-ground storage tanks containing gasoline and diesel, will result in the individual being barred from the site.

EXCLUSION ZONES

Exclusion zones are usually cordoned off with tape, a fence, a line painted on the ground, etc., and no one other than designated personnel may enter without the specific permission of the SSO. Exclusion zones include but are not limited to excavations, confined spaces, areas where backhoes and trucks or other heavy

equipment need to operate, and within 100 feet of fuel recovery equipment -- especially above-ground storage tanks containing fuel. The Site Safety Officer may establish an exclusion zone at any time, for any reason, controlling areal extent of the zone and access. The SSO may even establish special rules for entry, such as wearing special protective clothing and respiratory protection.

JOB HAZARD ANALYSES

Fire and/or explosion, due to the presence of combustible vapors from the large volumes of gasoline and diesel present, are the hazards most likely to be encountered on-site. In addition, gasoline and diesel have low vaporizing pressures and vapors will accumulate in confined spaces on-site. If enough vapors are present to displace the breathable air, any worker entering the confined area will be asphyxiated (defined as passing out or dying as a result of a lack of oxygen). The fuel vapors also contain volatile hydrocarbons that can be absorbed into the body. This includes benzene, a known carcinogen. Elevated concentrations of lead have been detected in some soil samples and could pose a health risk if ingested.

Other hazards include those commonly encountered when operating any mechanical equipment, such as the danger of falling objects or moving machinery.

SAFE OPERATION OF EQUIPMENT

The following simple precautions will reduce or eliminate risks associated with operating such equipment as backhoes, cranes, drilling rigs, recovery pumps, recovered fuel storage tanks, water treatment systems, dump trucks, motors, and vacuum trucks.

1) Only qualified personnel will have any contact with this equipment,

2) All on-site personnel, including contractors and their employees, are required to wear hard hats and steel-toed boots when in close proximity to any heavy equipment.

3) All on-site personnel working with flammable materials such as recovered fuel will wear, under their disposable rain gear, nonabsorbent clothes that do not ignite easily, heavy sol-vex gloves, and a properly fitted respirator with fresh organic vapor cartridges. This includes personnel involved in investigative drilling when free fuel is encountered.

4) Organic vapors will be continually measured 1 to 2 feet below the breathing space with a Bacharach TLV Sniffer calibrated to 500 parts per million (ppm) hexane. If the vapor concentrations exceed 100 ppm for longer than 1 minute or 250 ppm at any time all on-site personnel working in the vicinity will use respiratory protection. In the event vapor levels exceed 1,000 ppm work will stop immediately and workers leave the area.

5) Organic vapors will be measured in the vicinity of all motorized equipment and operations will cease if vapors are determined to be in excess of 10% of the Lower Explosive Limit (LEL).

6) On-site personnel will periodically stop working to change and dispose of outer protective clothing and gloves to prevent accumulation or build up of flammable fuel products and materials.

7) In the event a worker's clothes become contaminated with flammable material, the worker will immediately stop work, leave the area, and go to an designated area to change clothes.

8) Only designated personnel will enter "exclusion" zones when equipment is operating.

9) Smoking will be allowed only in designated areas, and on-site personnel will be forbidden to even have in their possession cigarettes, matches, lighters, or other flame-producing objects.

10) All equipment associated with the recovery system, particularly pumps, tanks, etc., should be properly grounded. The grounds should be checked regularly.

PERSONAL PROTECTION

Every on-site worker is responsible for his or her own personal safety and the safety of others. When working in hazardous areas, personnel will work in pairs -- always working with and watching out for their assigned "buddy." Common sense must be used at all times, and it is the obligation of each individual to comply with all local, state and federal laws and regulations.

All personnel on-site will have access to respirators with organic vapor cartridges, and replacement cartridges will be available. They will wear protective clothing, including heavy gloves, when handling contaminated materials, and hard hats when in proximity

to overhead equipment. Steel-toed boots will be worn when lifting anything weighing 50 pounds or more.

Proper respiratory equipment will be worn if vapor concentrations exceed levels established in this Site Safety Plan, or as determined by the SSO. Latex sampling gloves and plastic rain suits will be worn by persons collecting or handling contaminated materials to prevent exposure to contaminants such as soil, groundwater or free product. Gloves will be changed regularly and used ones discarded to avoid accumulation on their safety equipment. Furthermore, to prevent accidental ignition of flammable materials, no smoking (except in designated areas), open flame, sparks, or static discharge will be permitted.

PERSONAL HYGIENE

On-site personal are responsible for keeping themselves and their personal clothing clean. They should properly clean themselves prior to eating or leaving the site. Any contaminated material must either be cleaned on-site or disposed of in the proper and legal manner. On-site personnel who work in hazardous areas must be clean-shaven for proper fitting and wearing of respiratory protective equipment.

RESPIRATORY PROTECTION

On-site personnel must have their own half-mask respirator for which they been properly fitted. Fresh organic vapor filters should be used on a daily basis or when breakthrough occurs. When vapor concentrations exceed 1,000 ppm in the breathing space, workers with filtered air respirators will stop work and immediately leave the area.

In areas with vapor concentration in excess of 1,000 ppm where work must continue, self-contained breathing apparatus will be used by on-site personnel trained to do so.

CONFINED AREAS

On-site personnel working in confined spaces or areas with restricted ventilation such as buildings, low areas, excavations, or fenced-in remediation equipment will continuously measure vapor levels, oxygen levels, and have on hand a five-minute self-contained emergency escape pack.

RISK ASSESSMENT SUMMARY

Exposure to chemicals anticipated on-site include lead, benzene, toluene and xylene (BTX). These chemicals represent a hazard because they are moderately to extremely toxic and most are highly flammable. Threshold Limit Values (TLV's), Short Term Exposure Limits (STEL's), Toxicity levels (LD50, oral-rat), and Total Threshold Limit Concentration (TTLC), all in mg/kg (ppm) with the exception of Lead TLV which is in mg/m^3 (milligrams per cubic meter of air), are listed below:

Compound	TLV	STEL	Toxicity	TTLC
Benzene	1	10	4894	-
Toluene	100	150	5000	-
Xylene	100	150	4300	-
Lead	0.15	-	-	1,000

Applicable MSDS forms are attached.

Exposure Monitoring Plan

A Bacharach TLV Sniffer, calibrated to 500 ppm hexane, will be used to monitor vapor concentrations around the Facility. Should concentrations exceed TLV's, protective measures will be taken.

A carbon monoxide detector, an oxygen meter, and a combustible gas monitor will be used to monitor ambient air whenever on-site personnel are working with equipment in enclosed or confined areas.

Decontamination Measures

Avoidance of contamination is the best method for protection. Common sense dictates that on-site personnel avoid sitting, leaning, or placing equipment on possibly contaminated soil.

All personnel will be advised to wash their hands, neck, and face with soap and water before taking a break or leaving the site. Respirators will be washed with soap and water following each day's use.

Machinery, tools, drilling and sampling equipment used will be decontaminated by steam-cleaning. Sampling equipment will be decontaminated before each sample is taken, and drilling equipment will be decontaminated before each boring is commenced as well as before coming onto or leaving the site.

General Safety Work Practices

Personal safety and hygiene should be of utmost consideration while on-site. To prevent ingestion of contaminants, no person shall be allowed to eat, drink, or smoke on the site. The SSO will designate an appropriate area.

Standard Operating Procedures

On-site personnel will be briefed each day in "tailgate" meetings as to the day's goals and equipment to be used. Anticipated contaminants and emergency procedures will be reviewed. Appropriate personal protective equipment will be put on and verified correct by the SSO, including respirator fit.

Training Requirements

The SSO will conduct a pre-site training session which will cover all points of MSDS forms, including contaminant properties, warning signs, health hazard data, risks from exposure, and emergency first aid. The SSO will assure that everyone fully understands site hazards.

Medical Surveillance Program

According to Code of Federal Regulations (CFR) 29, 1910.120, Paragraph (f), employees who wear respirators 30 days or more during one year or who have been exposed to hazardous substances or health hazards above established permissible exposure limits are required to be monitored medically. All site personnel will be required to have had a complete chemical physical within the past year.

Recordkeeping

Documentation will be kept on all personnel exposed to contaminant hazards on the job site according to CFR 29 regulations. These will include documentation that employees have received training on the SSP, respiratory protection, MSDS forms, and all emergency procedures. These will be reviewed during the pre-site training meeting.

Exposure records on each job will be kept for 30 years to meet CFR 29 requirements. Included will be names and Social Security numbers of employees, medical evaluations, on-the-job logs from entry to exit, first aid administered, visits on-site by outside persons, and personal air monitoring records.

Contingency Plans

In the event of accident, injury, or other emergency, the Project Director, Senior Project Manager, or other person will notify appropriate government agencies or individuals as follows:

1) Police, Fire, or Ambulance emergency: 911

2) Nearest Emergency Hospital:

   Highland Hospital
   1411 E. 31st Street
   Oakland, California
   (415) 534-8055
   Map attached.

3) Alameda County Department of Health
   Hazardous Materials Division
   80 Swan Way, Room 200
   Oakland, CA 94621

Prepared by: James A. Perry Date: 2·13·89
James A. Perry
Hazard Materials Specialist

Approved by: Karl J. Anania Date: 2-13-89
Karl J. Anania
Registered Geologist

Read by: (Sign) _____ Date: _____

(Print) _____

SSP2-7.059

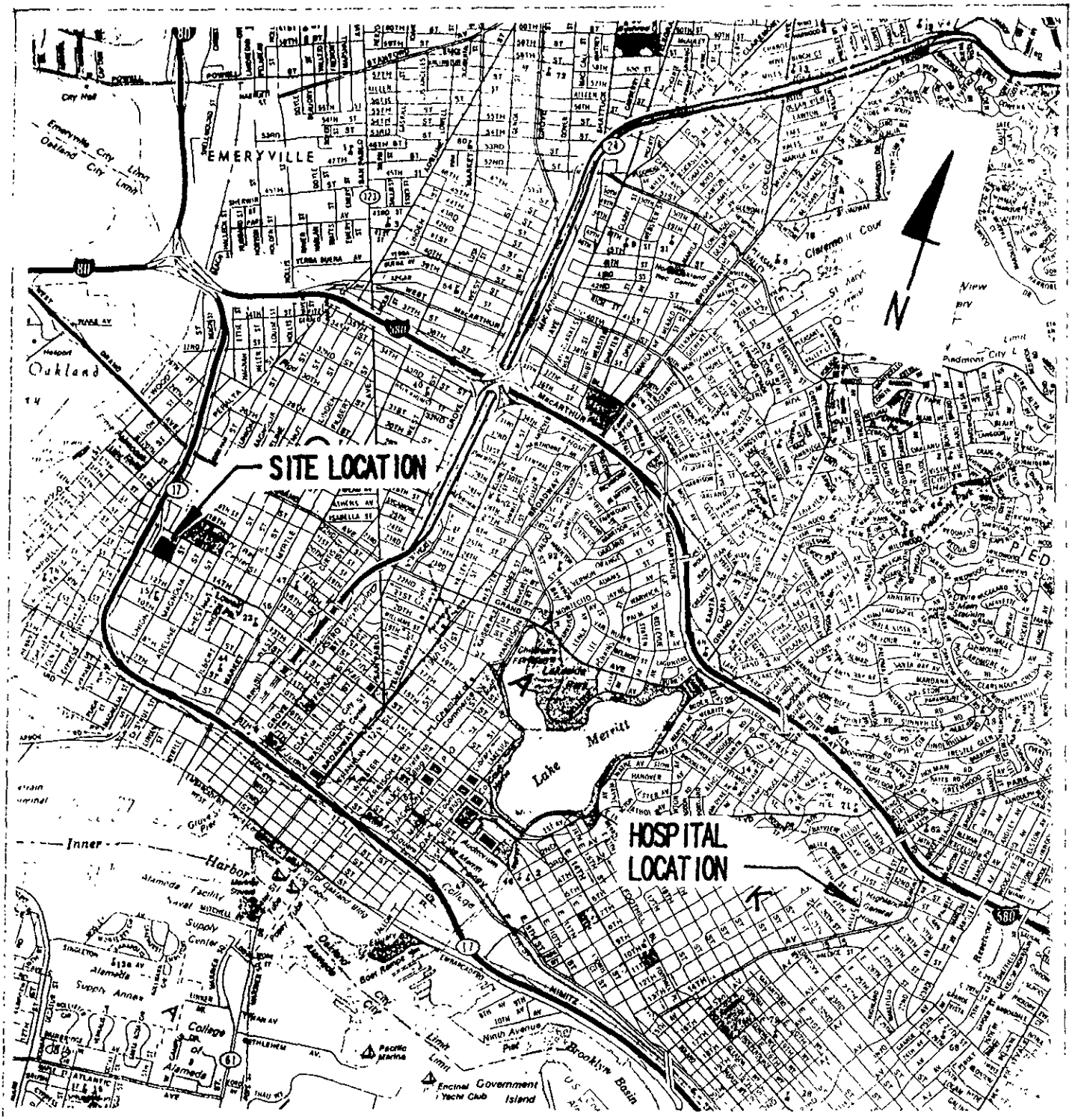
Directions from Carnation Site to Highland Hospital

1. Turn right out of the gate from the site.
2. Turn right on Poplar.
3. Turn left on 14th Street.
4. Turn right on Brush, go a few blocks.
5. Take I-980 West. I-980 turns into 880 South to San Jose. Go 3 or 4 exits.
6. Take 16th Avenue exit - go about 1 block.
7. Turn left on Embarcadero.
8. Turn left on 16th Avenue overpass.
9. Turn left on East 12th Avenue.
10. Turn right on 14th Avenue; go approximately 1-1/2 miles.
11. Turn left on East 31st Avenue.

The Emergency room is down East 31st at Stuart Street.

2/22/89
emergncy.059

AGE
11330 SUNRISE PARK DR., SUITE C • RANCHO CORDOVA, CA 95742
P.O. BOX 161148 • SACRAMENTO, CA 95816 • PHONE (916) 631-0154 FAX (916) 631-0528



AGE
ANANIA GEOLOGIC ENGINEERING

TITLE: SITE LOCATION MAP					
PROJECT NAME: CARNATION/OAKLAND				PROJECT NO: 004-88-059	
SITE LOCATION: 1310 14th ST. AT POPLAR ST. OAKLAND					
FIG. NO.	DATE	DRAWING BY	CHECKED BY	APPROVED BY	SCALE
4	2-13-89	CHRIS DIDIO			NONE

Dear Customer: This MSDS contains important environmental, health and toxicology information for your employees who recently ordered this product. Please make sure this information is given to them. If you resell this product, this MSDS should be given to the Buyer. This Form may be reproduced without permission.

Chevron U S A Inc

Material Safety Data Sheet

Prepared According to the OSHA Hazard Communication Standard (29 CFR 1910.1200). (Formerly Called MATERIAL INFORMATION BULLETIN)

CHEVRON Regular Gasoline **CPS 201305**

DANGER! **HARMFUL OR FATAL IF SWALLOWED. VAPOR HARMFUL**
LONG-TERM EXPOSURE TO VAPOR HAS CAUSED CANCER IN LABORATORY ANIMALS
MAY CAUSE EYE AND SKIN IRRITATION. EXTREMELY FLAMMABLE
CONTAINS LEAD. KEEP OUT OF REACH OF CHILDREN

TYPICAL COMPOSITION

Blend of paraffins, naphthenes, aromatics and olefins including less than the percentages indicated for the following: 20% toluene (CAS 108-88-3), 20% xylenes (CAS 1330-20-7), 10% methyl tert butyl ether (MTBE) (CAS 1634-04-4), 5% benzene (CAS 71-43-2), 3% n-hexane (CAS 110-54-3), 5% cyclohexane (CAS 110-82-7), 3% ethyl benzene (CAS 100-41-4) and 0.2 g/gal lead (as lead alkyl)

EXPOSURE STANDARD

The ACGIH (1987-88) TLV for gasoline is 300 ppm for a daily 8-hour exposure. No Federal OSHA exposure standard has been established for this material. The Federal OSHA exposure standard for benzene is 1 ppm for a daily 8-hour exposure with a 15 minute STEL of 5 ppm. The ACGIH (1987-88) TLV is 10 ppm for a daily 8-hour exposure. See Additional Health Data for discussion of benzene exposure limits.

PHYSIOLOGICAL & HEALTH EFFECTS	EMERGENCY & FIRST AID PROCEDURES
Eyes	
Eye irritation may result from contact with the liquid or exposure to the vapor. The scientific literature warns that vapor concentrations above 500 ppm are irritating.	Flush eyes immediately with fresh water for at least 15 minutes while holding the eyelids open. If irritation persists, see a doctor.
Skin	
Prolonged or frequently repeated liquid contact may cause skin irritation or may cause the skin to become cracked or dry from the defatting action of this material. See Additional Health Data.	Wash skin thoroughly with soap and water. See a doctor if any signs or symptoms described in this MSDS develop or if any skin irritation occurs. Launder contaminated clothing.
Inhalation	
Prolonged or repeated breathing of gasoline vapor may be harmful. See Additional Health Data.	Move exposed person to fresh air. If breathing has stopped, apply artificial respiration. Call a doctor immediately. See Respiratory Protection, Page 2.
Ingestion	
This material is expected to be only slightly toxic by ingestion. **Note to Physician:** See Additional Health Data.	If swallowed, DO NOT make person vomit. Call a doctor immediately.

ADDITIONAL HEALTH DATA
See following pages

SPECIAL PROTECTIVE INFORMATION
Eye Protection: Keep away from eyes. Eye contact can be avoided by wearing chemical safety goggles.
Skin Protection: Keep away from skin. Skin contact can be minimized by wearing impervious protective clothing including gloves.
Respiratory Protection: Avoid prolonged breathing of vapor by using approved respiratory protection. Refer to the OSHA Benzene Standard to determine what type of respirator is required based on exposure levels. In open areas, such as outdoor gasoline transfer areas, ventilation is usually adequate to prevent prolonged breathing of high gasoline vapor concentrations. See Additional Health Data.
Ventilation: Use this material only in well ventilated areas.
Comment: If you experience any of the signs or symptoms described in this MSDS, you may be exposed to harmful gasoline levels. Your exposure can be minimized if you follow the protective measures presented above.

FIRE PROTECTION
This product presents an extreme fire hazard. Liquid very quickly evaporates, even at low temperatures, and forms vapor (fumes) which can catch fire and burn with explosive violence. Invisible vapor spreads easily and can be set on fire by many sources such as pilot lights, welding equipment, and electrical motors and switches.
Flash Point: (P-M)<-49°F(-45°C)
Autoignition Temp.: NDA
Flammability Limits: 1.4-7.6%
Extinguishing Media: CO_2, Dry Chemical, Foam, Water Fog.
Special Fire Fighting Procedures: For fires involving this material, do not enter any enclosed or confined fire space without proper protective equipment. This may include self-contained breathing apparatus to protect against the hazardous effects of normal products of combustion or oxygen deficiency. Read the entire MSDS.

SPECIAL PRECAUTIONS
See last page of this MSDS.

ENVIRONMENTAL PROTECTION
Environmental Impact: Certain geographical areas have air pollution restrictions concerning the use of materials in work situations which may release volatile components to the atmosphere. Air pollution regulations should be studied to determine if this material is regulated in the area where it is to be used. This material is considered to be a water pollutant and releases of this product should be prevented from contaminating soil and water and from entering drainage and sewer systems.
Precautions if Material is Released or Spilled: Eliminate all sources of ignition in vicinity of spill or released vapor. Clean up small spills using appropriate techniques such as sorbent materials or pumping. Where feasible and appropriate, remove contaminated soil. Follow prescribed procedures for reporting and responding to larger releases.
Waste Disposal Methods: Place contaminated materials in disposable containers and dispose of in a manner consistent with applicable regulations. Contact local environmental or health authorities for approved disposal of this material.

REACTIVITY DATA
Stability (Thermal, Light, etc.): Stable.
Incompatibility (Materials to Avoid): May react with strong oxidizing materials.
Hazardous Decomposition Products: Normal combustion forms carbon dioxide and water vapor; incomplete combustion can produce carbon monoxide.
Hazardous Polymerization: Will not occur.

PHYSICAL PROPERTIES
Solubility: Soluble in hydrocarbons; insoluble in water.
Appearance (Color, Odor, etc.): Orange to bronze liquid.
Boiling Point: 25-225°C (Range)*
Melting Point: n/a
Specific Gravity: 0.7-0.8 (Range)
Vapor Pressure: 5-15 psi (max.) @ 100°F (Range)*
Vapor Density (Air=1): 3-4(Range)
Percent Volatile (Volume %): 99+
Evaporation: NDA
*Variable with season and location.

n/a = Not Applicable
NDA = No Data Available

Material Safety Data Sheet

CHEVRON Regular Gasoline **CPS 201305**

ADDITIONAL HEALTH DATA

Ingestion of gasoline or inhalation of gasoline vapor at airborne concentrations exceeding 1000 ppm may cause signs and symptoms of central nervous system depression such as headache, dizziness, loss of appetite, weakness and loss of coordination. Vapor concentrations in excess of 5000 ppm may cause loss of consciousness, coma and death. Intentional exposures to excessively high concentrations (e.g., when used as a drug of abuse) have been reported to result in clinical manifestations that may include convulsions, delirium, and hallucinations. These manifestations are not known to occur following accidental inhalation of vapor or skin contact with gasolines during normal operations. Brief exposures to high vapor concentrations may also cause pulmonary edema and bronchitis. **Note to Physician:** Ingestion of this product or subsequent vomiting can result in aspiration of light hydrocarbon liquid which can cause pneumonitis.

This product may contain up to 4.9% benzene. The OSHA Benzene Standard (29 CFR 1910.1028) contains detailed requirements for training, exposure monitoring, respiratory protection and medical surveillance triggered by the exposure level. Refer to the OSHA Standard before using this product. Repeated or prolonged breathing of benzene vapors has been associated with the development of chromosomal damage in experimental animals and various blood diseases in humans ranging from aplastic anemia to leukemia (a form of cancer). All of these diseases can be fatal. Following a two-year cancer bioassay sponsored by the National Toxicology Program, NTP concluded that benzene is a carcinogen for rats and mice of both sexes. In its Monograph Supplement 4, the International Agency for Research on Cancer (IARC) listed benzene in Group 1, chemicals carcinogenic to humans. No teratogenic effects have been shown to occur in pregnant laboratory animals exposed to doses not acutely toxic to the mother. However, some evidence of fetotoxicity such as delayed physical development has been seen at such levels. The available information on the effects of benzene on human pregnancies is inadequate but it has been established that benzene can cross the human placenta.**Note:** Limiting the total hydrocarbon exposure to 300 ppm, the ACGIH TLV for gasoline, may not keep the benzene concentration below the 1 ppm Federal OSHA exposure standard and ACGIH TLV for benzene.

This product contains n-hexane. Prolonged or repeated contact with n-hexane may produce peripheral neuropathy characterized by progressive weakness and numbness in the extremities, loss of deep tendon reflexes and reduction of motor nerve conduction velocity. Recovery ranges from no recovery to complete recovery depending upon the duration of exposure and the severity of the nerve damage.

This product contains toluene. Toluene has been reported to decrease immunological responses in test animals. It has also been reported that when young rats were exposed to 1000 ppm toluene for 14 hours daily, for two weeks, irreversible hearing loss was detected. The same daily exposure to 700 ppm for as long as 16 weeks was without effect. Since the level necessary to produce hearing loss is greater than 7 times the 1987-88 ACGIH TLV for toluene, worker exposures at or below 100 ppm is not expected to cause any adverse effect. There are also reports that chronic abusers (glue sniffers, solvent huffers) of solvents containing toluene have suffered liver, kidney and brain damage. Scientific studies on toluene have failed to demonstrate teratogenicity in rats and mice. However, toluene has been shown to cause delayed growth and extra ribs in the offspring

of rats and mice at inhaled doses (266-399 ppm) that were non-toxic to the mother. Toluene has not conclusively been shown to cause adverse reproductive effects in humans.

This product contains xylene which has been reported to be embryotoxic and to cause developmental disturbances in rats and mice exposed before birth. Xylene has given negative results in several mutagen testing assays including the Ames assay. In a carcinogenicity bioassay sponsored by the National Toxicology Program (NTP), technical grade xylene gave no evidence of carcinogenicity in rats or mice dosed daily for two years.

The American Petroleum Institute (API) sponsored a study where laboratory animals were exposed to 67, 292 and 2056 ppm unleaded gasoline vapor six hours/day, five days/week for approximately two years. Each exposure group consisted of 200 rats and 200 mice. During the course of the study, male rats had an increased incidence of kidney damage followed by repair and enlargement of kidney tubules. At the end of the study, a dose-related incidence of microscopic kidney tumors was detected in the male rats; two tumors were found in the low exposure group, and five were found in the high exposure group. Female rats and both male and female mice did not show this type of lesion. It was noted in the study that the animals that were exposed to gasoline vapors lived longer than the control. Thus, the significance of the tumor findings is difficult to evaluate at this time. Additional findings in the API - sponsored study, which were observed only at the highest does tested (2065 ppm), included (1) failure to gain body weight, (2) increased incidence of hepatocellular carcinomas (liver cancer) in female mice, and (3) lung inflammation in male and female rats. Subsequent testing has shown that 6 to 10-carbon isoparaffinic compounds in gasoline may be responsible for the early kidney damage observed in male rats in the API study. Information collected by the API and others indicates that the damage occurs only in the male rat, does not occur in female rats or mice and monkeys of either sex and may not occur in man. Although the larger isoparaffins have not been tested, 2,2,4-trimethyl pentane (TMP), an 8-carbon isoparaffinic compound of unleaded gasoline, has been shown to cause kidney damage. A metabolite of TMP has been shown to combine with alpha-2-microglobulin, a protein found only in male rats. The relevance of this reversible binding to the causation of the kidney damage is being studied. How this early kidney injury relates to the development of kidney tumors seen in the API study is currently unknown.

The significance to man of the results of the studies discussed above is not known. While we believe that low level or infrequent exposure to gasoline vapor is not likely to cause cancer or other serious disease, in light of the above information, the precautions outlined in this MSDS should be carefully observed. If strong odor of gasoline is present or if any irritation occurs, individuals should leave the area or institute suitable protective measures (see - Special Protective Information).

SPECIAL PRECAUTIONS

NEVER siphon gasoline by mouth. READ AND OBSERVE ALL PRECAUTIONS ON PRODUCT LABEL.

Use only as a motor fuel. Do not use for cleaning, pressure appliance fuel, or any other such use. DO NOT USE OR STORE near flame, sparks or hot surfaces. USE AND STORE ONLY IN COOL, WELL VENTILATED AREA. Keep container closed. DO NOT TRANSFER LIQUID TO AN UNLABELED CONTAINER. DO NOT weld, heat or drill container. Replace cap or bung. Emptied container still contains hazardous or explosive vapor or liquid.

NFPA RATINGS: Health 1; Flammability 3; Reactivity 0.

HMIS Hazard Ratings: Health 2; Flammability 3; Reactivity 0.

This product contains a toxic chemical or chemicals listed below which are subject to the reporting requirements of section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR Part 372.

Chemical	CAS #	% Composition
Benzene	71-43-2	1.2-1.4
Methylbenzene (Toluene)	108-88-3	4.3-6.5
Ethylbenzene	100-41-4	0.9-1.4
O-Dimethyl benzene (Xylene)	95-47-6	1.4-2.2
p-Dimethyl benzene (Xylene)	106-42-3	0.7-0.9
m-Dimethyl benzene (Xylene)	108-38-3	3.0-4.6
Cyclohexane (Hexahydrobenzene)	110-82-7	0.5-2.4
Methyl tert-butyl ether	1634-04-4	10.0 Max.

Dear Customer: This MSDS contains important environmental, health and toxicology information for your employees who recently ordered this product. Please make sure this information is given to them. If you resell this product, this MSDS should be given to the Buyer. This Form may be reproduced without permission.

Chevron U S A Inc

Material Safety Data Sheet

Prepared According to the OSHA Hazard Communication Standard (29 CFR 1910.1200).
(Formerly Called MATERIAL INFORMATION BULLETIN)

CHEVRON Unleaded Gasoline

CPS 201110

DANGER! HARMFUL OR FATAL IF SWALLOWED. VAPOR HARMFUL
LONG-TERM EXPOSURE TO VAPOR HAS CAUSED CANCER IN LABORATORY ANIMALS
MAY CAUSE EYE AND SKIN IRRITATION. EXTREMELY FLAMMABLE
KEEP OUT OF REACH OF CHILDREN

TYPICAL COMPOSITION

Blend of paraffins, naphthenes, aromatics and olefins including less than the percentages indicated for the following: 20% toluene (CAS 108-88-3), 20% xylenes (CAS 1330-20-7), 10% methyl tert butyl ether (MTBE) (CAS 1634-04-4), 5% benzene (CAS 71-43-2), 3% n-hexane (CAS 110-54-3), 5% cyclohexane (CAS 110-82-7) and 3% ethyl benzene (CAS 100-41-4)

EXPOSURE STANDARD

The ACGIH (1987-88) TLV for gasoline is 300 ppm for a daily 8-hour exposure. No Federal OSHA exposure standard has been established for this material. The Federal OSHA exposure standard for benzene is 1 ppm for a daily 8-hour exposure with a 15 minute STEL of 5 ppm. The ACGIH (1987-88) TLV is 10 ppm for a daily 8-hour exposure. See Additional Health Data for discussion of benzene exposure limits.

PHYSIOLOGICAL & HEALTH EFFECTS

Eyes

Eye irritation may result from contact with the liquid or exposure to the vapor. The scientific literature warns that vapor concentrations above 500 ppm are irritating.

Skin

Prolonged or frequently repeated liquid contact may cause skin irritation or may cause the skin to become cracked or dry from the defatting action of this material. See Additional Health Data.

Inhalation

Prolonged or repeated breathing of gasoline vapor may be harmful. See Additional Health Data.

Ingestion

This material is expected to be only slightly toxic by ingestion. Note to Physician: See Additional Health Data.

EMERGENCY & FIRST AID PROCEDURES

Eyes

Flush eyes immediately with fresh water for at least 15 minutes while holding the eyelids open. If irritation persists, see a doctor.

Skin

Wash skin thoroughly with soap and water. See a doctor if any signs or symptoms described in this MSDS develop or if any skin irritation occurs. Launder contaminated clothing.

Inhalation

Move exposed person to fresh air. If breathing has stopped, apply artificial respiration. Call a doctor immediately. See Respiratory Protection, Page 2.

Ingestion

If swallowed, DO NOT make person vomit. Call a doctor immediately.

ADDITIONAL HEALTH DATA

See following pages

SPECIAL PROTECTIVE INFORMATION

Eye Protection: Keep away from eyes. Eye contact can be avoided by wearing chemical safety goggles.

Skin Protection: Keep away from skin. Skin contact can be minimized by wearing impervious protective clothing including gloves.

Respiratory Protection: Avoid prolonged breathing of vapor by using approved respiratory protection. Refer to the OSHA Benzene Standard to determine what type of respirator is required based on exposure levels. In open areas, such as outdoor gasoline transfer areas, ventilation is usually adequate to prevent prolonged breathing of high gasoline vapor concentrations. See Additional Health Data.

Ventilation: Use this material only in well ventilated areas.

Comment: If you experience any of the signs or symptoms described in this MSDS, you may be exposed to harmful gasoline levels. Your exposure can be minimized if you follow the protective measures presented above.

FIRE PROTECTION

This product presents an extreme fire hazard. Liquid very quickly evaporates, even at low temperatures, and forms vapor (fumes) which can catch fire and burn with explosive violence. Invisible vapor spreads easily and can be set on fire by many sources such as pilot lights, welding equipment, and electrical motors and switches.

Flash Point: (P-M)<-49°F(-45°C)

Autoignition Temp.: NDA

Flammability Limits: 1.4-7.6%

Extinguishing Media: CO_2, Dry Chemical, Foam, Water Fog.

Special Fire Fighting Procedures: For fires involving this material, do not enter any enclosed or confined fire space without proper protective equipment. This may include self-contained breathing apparatus to protect against the hazardous effects of normal products of combustion or oxygen deficiency. Read the entire MSDS.

SPECIAL PRECAUTIONS

See last page of this MSDS.

ENVIRONMENTAL PROTECTION

Environmental Impact: Certain geographical areas have air pollution restrictions concerning the use of materials in work situations which may release volatile components to the atmosphere. Air pollution regulations should be studied to determine if this material is regulated in the area where it is to be used. This material is considered to be a water pollutant and releases of this product should be prevented from contaminating soil and water and from entering drainage and sewer systems.

Precautions if Material is Released or Spilled: Eliminate all sources of ignition in vicinity of spill or released vapor. Clean up small spills using appropriate techniques such as sorbent materials or pumping. Where feasible and appropriate, remove contaminated soil. Follow prescribed procedures for reporting and responding to larger releases.

Waste Disposal Methods: Place contaminated materials in disposable containers and dispose of in a manner consistent with applicable regulations. Contact local environmental or health authorities for approved disposal of this material.

REACTIVITY DATA

Stability (Thermal, Light, etc.): Stable

Incompatibility (Materials to Avoid): May react with strong oxidizing materials.

Hazardous Decomposition Products: Normal combustion forms carbon dioxide and water vapor; incomplete combustion can produce carbon monoxide.

Hazardous Polymerization: Will not occur.

PHYSICAL PROPERTIES

Solubility: Soluble in hydrocarbons; insoluble in water.

Appearance (Color, Odor, etc.): Clear to yellow liquid.

Boiling Point: 25-225°C (Range)*

Melting Point: n/a

Specific Gravity: 0.7-0.8 (Range)

Vapor Pressure: 5-15 psi (max) @ 100°F (Range)*

Vapor Density (Air=1): 3-4(Range)

Percent Volatile (Volume %): 99+

Evaporation: NDA

*Variable with season and location.

n/a = Not Applicable

NDA = No Data Available

Material Safety Data Sheet

CHEVRON Unleaded Gasoline CPS 201110

ADDITIONAL HEALTH DATA

Ingestion of gasoline or inhalation of gasoline vapor at airborne concentrations exceeding 1000 ppm may cause signs and symptoms of central nervous system depression such as headache, dizziness, loss of appetite, weakness and loss of coordination. Vapor concentrations in excess of 5000 ppm may cause loss of consciousness, coma and death. Intentional exposures to excessively high concentrations (e.g., when used as a drug of abuse) have been reported to result in clinical manifestations that may include convulsions, delirium, and hallucinations. These manifestations are not known to occur following accidental inhalation of vapor or skin contact with gasolines during normal operations. Brief exposures to high vapor concentrations may also cause pulmonary edema and bronchitis. **Note to Physician:** Ingestion of this product or subsequent vomiting can result in aspiration of light hydrocarbon liquid which can cause pneumonitis.

This product may contain up to 4.9% benzene. The OSHA Benzene Standard (29 CFR 1910.1028) contains detailed requirements for training, exposure monitoring, respiratory protection and medical surveillance triggered by the exposure level. Refer to the OSHA Standard before using this product. Repeated or prolonged breathing of benzene vapors has been associated with the development of chromosomal damage in experimental animals and various blood diseases in humans ranging from aplastic anemia to leukemia (a form of cancer). All of these diseases can be fatal. Following a two-year cancer bioassay sponsored by the National Toxicology Program, NTP concluded that benzene is a carcinogen for rats and mice of both sexes. In its Monograph Supplement 4, the International Agency for Research on Cancer (IARC) listed benzene in Group 1, chemicals carcinogenic to humans. No teratogenic effects have been shown to occur in pregnant laboratory animals exposed to doses not acutely toxic to the mother. However, some evidence of fetotoxicity such as delayed physical development has been seen at such levels. The available information on the effects of benzene on human pregnancies is inadequate but it has been established that benzene can cross the human placenta. **Note:** Limiting the total hydrocarbon exposure to 300 ppm, the ACGIH TLV for gasoline, may not keep the benzene concentration below the 1 ppm Federal OSHA exposure standard and ACGIH TLV for benzene.

This product contains n-hexane. Prolonged or repeated contact with n-hexane may produce peripheral neuropathy characterized by progressive weakness and numbness in the extremities, loss of deep tendon reflexes and reduction of motor nerve conduction velocity. Recovery ranges from no recovery to complete recovery depending upon the duration of exposure and the severity of the nerve damage.

This product contains toluene. Toluene has been reported to decrease immunological responses in test animals. It has also been reported that when young rats were exposed to 1000 ppm toluene for 14 hours daily, for two weeks, irreversible hearing loss was detected. The same daily exposure to 700 ppm for as long as 16 weeks was without effect. Since the level necessary to produce hearing loss is greater than 7 times the 1987-88 ACGIH TLV for toluene, worker exposures at or below 100 ppm is not expected to cause any adverse effect. There are also reports that chronic abusers (glue sniffers, solvent huffers) of solvents containing toluene have suffered liver, kidney and brain damage. Scientific studies on toluene have failed to demonstrate teratogenicity in rats and mice. However, toluene has been shown to cause delayed growth and extra ribs in the offspring

of rats and mice at inhaled doses (266-399 ppm) that were non-toxic to the mother. Toluene has not conclusively been shown to cause adverse reproductive effects in humans.

This product contains xylene which has been reported to be embryotoxic and to cause developmental disturbances in rats and mice exposed before birth. Xylene has given negative results in several mutagen testing assays including the Ames assay. In a carcinogenicity bioassay sponsored by the National Toxicology Program (NTP), technical grade xylene gave no evidence of carcinogenicity in rats or mice dosed daily for two years.

The American Petroleum Institute (API) sponsored a study where laboratory animals were exposed to 67, 292 and 2056 ppm unleaded gasoline vapor six hours/day, five days/week for approximately two years. Each exposure group consisted of 200 rats and 200 mice. During the course of the study, male rats had an increased incidence of kidney damage followed by repair and enlargement of kidney tubules. At the end of the study, a dose-related incidence of microscopic kidney tumors was detected in the male rats; two tumors were found in the low exposure group, and five were found in the high exposure group. Female rats and both male and female mice did not show this type of lesion. It was noted in the study that the animals that were exposed to gasoline vapors lived longer than the control. Thus, the significance of the tumor findings is difficult to evaluate at this time. Additional findings in the API - sponsored study, which were observed only at the highest does tested (2065 ppm), included (1) failure to gain body weight, (2) increased incidence of hepatocellular carcinomas (liver cancer) in female mice, and (3) lung inflammation in male and female rats. Subsequent testing has shown that 6 to 10-carbon isoparaffinic compounds in gasoline may be responsible for the early kidney damage observed in male rats in the API study. Information collected by the API and others indicates that the damage occurs only in the male rat, does not occur in female rats or mice and monkeys of either sex and may not occur in man. Although the larger isoparaffins have not been tested, 2,2,4-trimethyl pentane (TMP), an 8-carbon isoparaffinic compound of unleaded gasoline, has been shown to cause kidney damage. A metabolite of TMP has been shown to combine with alpha-2-microglobulin, a protein found only in male rats. The relevance of this reversible binding to the causation of the kidney damage is being studied. How this early kidney injury relates to the development of kidney tumors seen in the API study is currently unknown.

The significance to man of the results of the studies discussed above is not known. While we believe that low level or infrequent exposure to gasoline vapor is not likely to cause cancer or other serious disease, in light of the above information, the precautions outlined in this MSDS should be carefully observed. If strong odor of gasoline is present or if any irritation occurs, individuals should leave the area or institute suitable protective measures (see - Special Protective Information).

SPECIAL PRECAUTIONS

NEVER siphon gasoline by mouth. READ AND OBSERVE ALL PRECAUTIONS ON PRODUCT LABEL.

Use only as a motor fuel. Do not use for cleaning, pressure appliance fuel, or any other such use. DO NOT USE OR STORE near flame, sparks or hot surfaces. USE AND STORE ONLY IN COOL, WELL VENTILATED AREA. Keep container closed. DO NOT TRANSFER LIQUID TO AN UNLABELED CONTAINER. DO NOT weld, heat or drill container. Replace cap or bung. Emptied container still contains hazardous or explosive vapor or liquid.

NFPA RATINGS: Health 1; Flammability 3; Reactivity 0.

HMIS Hazard Ratings: Health 2; Flammability 3; Reactivity 0.

This product contains a toxic chemical or chemicals listed below which are subject to the reporting requirements of section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR Part 372.

Chemical	CAS #	% Composition
Benzene	71-43-2	1.2-1.4
Methylbenzene (Toluene)	108-88-3	4.3-6.5
Ethylbenzene	100-41-4	0.9-1.4
O-Dimethyl benzene (Xylene)	95-47-6	1.4-2.2
p-Dimethyl benzene (Xylene)	106-42-3	0.7-0.9
m-Dimethyl benzene (Xylene)	108-38-3	3.0-4.6
Cyclohexane (Hexahydrobenzene)	110-82-7	0.5-2.4
Methyl tert-butyl ether	1634-04-4	10.0 Max.

Material Safety Data Sheet

Prepared According to the OSHA Hazard Communication Standard (29 CFR 1910.1200).
(Formerly Called MATERIAL INFORMATION BULLETIN)

CHEVRON Supreme Unleaded Gasoline CPS 201060

DANGER! **HARMFUL OR FATAL IF SWALLOWED. VAPOR HARMFUL**
LONG-TERM EXPOSURE TO VAPOR HAS CAUSED CANCER IN LABORATORY ANIMALS
MAY CAUSE EYE AND SKIN IRRITATION. EXTREMELY FLAMMABLE
KEEP OUT OF REACH OF CHILDREN

TYPICAL COMPOSITION

Blend of paraffins, naphthenes, aromatics and olefins including less than the percentages indicated for the following: 20% toluene (CAS 108-88-3), 20% xylenes (CAS 1330-20-7), 10% methyl tert butyl ether (MTBE) (CAS 1634-04-4), 5% benzene (CAS 71-43-2), 5% n-hexane (CAS 110-54-3), 5% cyclohexane (CAS 110-82-7) and 5% ethyl benzene (CAS 100-41-4)

EXPOSURE STANDARD

The ACGIH (1987-88) TLV for gasoline is 300 ppm for a daily 8-hour exposure. No Federal OSHA exposure standard has been established for this material. The Federal OSHA exposure standard for benzene is 1 ppm for a daily 8-hour exposure with a 15 minute STEL of 5 ppm. The ACGIH (1987-88) TLV is 10 ppm for a daily 8-hour exposure. See Additional Health Data for discussion of benzene exposure limits.

PHYSIOLOGICAL & HEALTH EFFECTS	EMERGENCY & FIRST AID PROCEDURES
Eyes	
Eye irritation may result from contact with the liquid or exposure to the vapor. The scientific literature warns that vapor concentrations above 500 ppm are irritating.	Flush eyes immediately with fresh water for at least 15 minutes while holding the eyelids open. If irritation persists, see a doctor.
Skin	
Prolonged or frequently repeated liquid contact may cause skin irritation or may cause the skin to become cracked or dry from the defatting action of this material. See Additional Health Data.	Wash skin thoroughly with soap and water. See a doctor if any signs or symptoms described in this MSDS develop or if any skin irritation occurs. Launder contaminated clothing.
Inhalation	
Prolonged or repeated breathing of gasoline vapor may be harmful. See Additional Health Data.	Move exposed person to fresh air. If breathing has stopped, apply artificial respiration. Call a doctor immediately. See Respiratory Protection, Page 2.
Ingestion	
This material is expected to be only slightly toxic by ingestion. **Note to Physician:** See Additional Health Data.	If swallowed, DO NOT make person vomit. Call a doctor immediately.

ADDITIONAL HEALTH DATA

See following pages

SPECIAL PROTECTIVE INFORMATION

Eye Protection: Keep away from eyes. Eye contact can be avoided by wearing chemical safety goggles.

Skin Protection: Keep away from skin. Skin contact can be minimized by wearing impervious protective clothing including gloves.

Respiratory Protection: Avoid prolonged breathing of vapor by using approved respiratory protection. Refer to the OSHA Benzene Standard to determine what type of respirator is required based on exposure levels. In open areas, such as outdoor gasoline transfer areas, ventilation is usually adequate to prevent prolonged breathing of high gasoline vapor concentrations. See Additional Health Data.

Ventilation: Use this material only in well ventilated areas.

Comment: If you experience any of the signs or symptoms described in this MSDS, you may be exposed to harmful gasoline levels. Your exposure can be minimized if you follow the protective measures presented above.

FIRE PROTECTION

This product presents an extreme fire hazard. Liquid very quickly evaporates, even at low temperatures, and forms vapor (fumes) which can catch fire and burn with explosive violence. Invisible vapor spreads easily and can be set on fire by many sources such as pilot lights, welding equipment, and electrical motors and switches.

Flash Point: (P-M)<-49°F(-45°C)

Autoignition Temp.: NDA

Flammability Limits: 1.4-7.6%

Extinguishing Media: CO_2, Dry Chemical, Foam, Water Fog.

Special Fire Fighting Procedures: For fires involving this material, do not enter any enclosed or confined fire space without proper protective equipment. This may include self-contained breathing apparatus to protect against the hazardous effects of normal products of combustion or oxygen deficiency. Read the entire MSDS.

SPECIAL PRECAUTIONS

See last page of this MSDS.

ENVIRONMENTAL PROTECTION

Environmental Impact: Certain geographical areas have air pollution restrictions concerning the use of materials in work situations which may release volatile components to the atmosphere. Air pollution regulations should be studied to determine if this material is regulated in the area where it is to be used. This material is considered to be a water pollutant and releases of this product should be prevented from contaminating soil and water and from entering drainage and sewer systems.

Precautions if Material is Released or Spilled: Eliminate all sources of ignition in vicinity of spill or released vapor. Clean up small spills using appropriate techniques such as sorbent materials or pumping. Where feasible and appropriate, remove contaminated soil. Follow prescribed procedures for reporting and responding to larger releases.

Waste Disposal Methods: Place contaminated materials in disposable containers and dispose of in a manner consistent with applicable regulations. Contact local environmental or health authorities for approved disposal of this material.

REACTIVITY DATA

Stability (Thermal, Light, etc.): Stable

Incompatibility (Materials to Avoid): May react with strong oxidizing materials.

Hazardous Decomposition Products: Normal combustion forms carbon dioxide and water vapor; incomplete combustion can produce carbon monoxide.

Hazardous Polymerization: Will not occur.

PHYSICAL PROPERTIES

Solubility: Soluble in hydrocarbons; insoluble in water.

Appearance (Color, Odor, etc.): Red liquid.

Boiling Point: 25-225°C (Range)*

Melting Point: n/a

Specific Gravity: 0.7-0.8 (Range)

Vapor Pressure: 5-15 psi (max.) @ 100°F (Range)*

Vapor Density (Air=1): 3-4(Range)

Percent Volatile (Volume %): 99+

Evaporation: NDA

* Variable with season and location.

n/a = Not Applicable

NDA = No Data Available

Material Safety Data Sheet

CHEVRON Supreme Unleaded Gasoline **CPS 201060**

ADDITIONAL HEALTH DATA

Ingestion of gasoline or inhalation of gasoline vapor at airborne concentrations exceeding 1000 ppm may cause signs and symptoms of central nervous system depression such as headache, dizziness, loss of appetite, weakness and loss of coordination. Vapor concentrations in excess of 5000 ppm may cause loss of consciousness, coma and death. Intentional exposures to excessively high concentrations (e.g., when used as a drug of abuse) have been reported to result in clinical manifestations that may include convulsions, delirium, and hallucinations. These manifestations are not known to occur following accidental inhalation of vapor or skin contact with gasolines during normal operations. Brief exposures to high vapor concentrations may also cause pulmonary edema and bronchitis. **Note to Physician:** Ingestion of this product or subsequent vomiting can result in aspiration of light hydrocarbon liquid which can cause pneumonitis.

This product may contain up to 4.9% benzene. The OSHA Benzene Standard (29 CFR 1910.1028) contains detailed requirements for training, exposure monitoring, respiratory protection and medical surveillance triggered by the exposure level. Refer to the OSHA Standard before using this product. Repeated or prolonged breathing of benzene vapors has been associated with the development of chromosomal damage in experimental animals and various blood diseases in humans ranging from aplastic anemia to leukemia (a form of cancer). All of these diseases can be fatal. Following a two-year cancer bioassay sponsored by the National Toxicology Program, NTP concluded that benzene is a carcinogen for rats and mice of both sexes. In its Monograph Supplement 4, the International Agency for Research on Cancer (IARC) listed benzene in Group 1, chemicals carcinogenic to humans. No teratogenic effects have been shown to occur in pregnant laboratory animals exposed to doses not acutely toxic to the mother. However, some evidence of fetotoxicity such as delayed physical development has been seen at such levels. The available information on the effects of benzene on human pregnancies is inadequate but it has been established that benzene can cross the human placenta. **Note:** Limiting the total hydrocarbon exposure to 300 ppm, the ACGIH TLV for gasoline, may not keep the benzene concentration below the 1 ppm Federal OSHA exposure standard and ACGIH TLV for benzene.

This product contains n-hexane. Prolonged or repeated contact with n-hexane may produce peripheral neuropathy characterized by progressive weakness and numbness in the extremities, loss of deep tendon reflexes and reduction of motor nerve conduction velocity. Recovery ranges from no recovery to complete recovery depending upon the duration of exposure and the severity of the nerve damage.

This product contains toluene. Toluene has been reported to decrease immunological responses in test animals. It has also been reported that when young rats were exposed to 1000 ppm toluene for 14 hours daily, for two weeks, irreversible hearing loss was detected. The same daily exposure to 700 ppm for as long as 16 weeks was without effect. Since the level necessary to produce hearing loss is greater than 7 times the 1987-88 ACGIH TLV for toluene, worker exposures at or below 100 ppm is not expected to cause any adverse effect. There are also reports that chronic abusers (glue sniffers, solvent huffers) of solvents containing toluene have suffered liver, kidney and brain damage. Scientific studies on toluene have failed to demonstrate teratogenicity in rats and mice. However, toluene has been shown to cause delayed growth and extra ribs in the offspring

of rats and mice at inhaled doses (266-399 ppm) that were non-toxic to the mother. Toluene has not conclusively been shown to cause adverse reproductive effects in humans.

This product contains xylene which has been reported to be embryotoxic and to cause developmental disturbances in rats and mice exposed before birth. Xylene has given negative results in several mutagen testing assays including the Ames assay. In a carcinogenicity bioassay sponsored by the National Toxicology Program (NTP), technical grade xylene gave no evidence of carcinogenicity in rats or mice dosed daily for two years.

The American Petroleum Institute (API) sponsored a study where laboratory animals were exposed to 67, 292 and 2056 ppm unleaded gasoline vapor six hours/day, five days/week for approximately two years. Each exposure group consisted of 200 rats and 200 mice. During the course of the study, male rats had an increased incidence of kidney damage followed by repair and enlargement of kidney tubules. At the end of the study, a dose-related incidence of microscopic kidney tumors was detected in the male rats; two tumors were found in the low exposure group, and five were found in the high exposure group. Female rats and both male and female mice did not show this type of lesion. It was noted in the study that the animals that were exposed to gasoline vapors lived longer than the control. Thus, the significance of the tumor findings is difficult to evaluate at this time. Additional findings in the API - sponsored study, which were observed only at the highest does tested (2065 ppm), included (1) failure to gain body weight, (2) increased incidence of hepatocellular carcinomas (liver cancer) in female mice, and (3) lung inflammation in male and female rats. Subsequent testing has shown that 6 to 10-carbon isoparaffinic compounds in gasoline may be responsible for the early kidney damage observed in male rats in the API study. Information collected by the API and others indicates that the damage occurs only in the male rat, does not occur in female rats or mice and monkeys of either sex and may not occur in man. Although the larger isoparaffins have not been tested, 2,2,4-trimethyl pentane (TMP), an 8-carbon isoparaffinic compound of unleaded gasoline, has been shown to cause kidney damage. A metabolite of TMP has been shown to combine with alpha-2-microglobulin, a protein found only in male rats. The relevance of this reversible binding to the causation of the kidney damage is being studied. How this early kidney injury relates to the development of kidney tumors seen in the API study is currently unknown.

The significance to man of the results of the studies discussed above is not known. While we believe that low level or infrequent exposure to gasoline vapor is not likely to cause cancer or other serious disease, in light of the above information, the precautions outlined in this MSDS should be carefully observed. If strong odor of gasoline is present or if any irritation occurs, individuals should leave the area or institute suitable protective measures (see - Special Protective Information).

SPECIAL PRECAUTIONS

NEVER siphon gasoline by mouth. READ AND OBSERVE ALL PRECAUTIONS ON PRODUCT LABEL.

Use only as a motor fuel. Do not use for cleaning, pressure appliance fuel, or any other such use. DO NOT USE OR STORE near flame, sparks or hot surfaces. USE AND STORE ONLY IN COOL, WELL VENTILATED AREA. Keep container closed. DO NOT TRANSFER LIQUID TO AN UNLABELED CONTAINER. DO NOT weld, heat or drill container. Replace cap or bung. Emptied container still contains hazardous or explosive vapor or liquid.

NFPA RATINGS: Health 1; Flammability 3; Reactivity 0.

HMIS Hazard Ratings: Health 2; Flammability 3; Reactivity 0.

This product contains a toxic chemical or chemicals listed below which are subject to the reporting requirements of section 313 of Title III of the Superfund Amendments and

Reauthorization Act of 1986 and 40 CFR Part 372.

Chemical	CAS #	% Composition
Benzene	71-43-2	0.2-3.6
Methylbenzene (Toluene)	108-88-3	2.9-14.0
Ethylbenzene	100-41-4	0.3-4.0
O-Dimethyl benzene (Xylene)	95-47-6	0.3-4.3
p-Dimethyl benzene (Xylene)	106-42-3	0.3-4.3
m-Dimethyl benzene (Xylene)	108-38-3	0.9-8.8
Cyclohexane (Hexahydrobenzene)	110-82-7	0.5-2.4
Methyl tert-butyl ether	1634-04-4	10.0 Max.

Material Safety Data Sheet

Prepared According to the OSHA Hazard Communication Standard (29 CFR 1910.1200). (Formerly Called MATERIAL INFORMATION BULLETIN)

CHEVRON Diesel Fuel No. 1 CPS 270003

DANGER! HARMFUL OR FATAL IF SWALLOWED
PROLONGED OR REPEATED CONTACT WITH SKIN CAN BE HARMFUL
MAY CAUSE SKIN IRRITATION
COMBUSTIBLE
KEEP OUT OF REACH OF CHILDREN

TYPICAL COMPOSITION

Petroleum mid-distillate (CAS 8008-20-6) 100%

EXPOSURE STANDARD

No Federal OSHA exposure standard or ACGIH TLV has been established for this material.

PHYSIOLOGICAL & HEALTH EFFECTS

Eyes

Expected to cause no more than minor eye irritation.

Skin

May cause skin irritation. Application of similar materials onto the skin of rabbits produced moderate to severe skin irritation. Prolonged or repeated skin contact may be harmful. See Additional Health Data.

Inhalation

Prolonged breathing of the vapor can cause central nervous system effects. See Additional Health Data.

Ingestion

Not expected to have acute systemic toxicity by ingestion. **Note to Physician:** Ingestion of this product or subsequent vomiting can result in aspiration of light hydrocarbon liquid which can cause pneumonitis.

EMERGENCY & FIRST AID PROCEDURES

Eyes

Flush eyes immediately with fresh water for at least 15 minutes while holding the eyelids open. If irritation persists, see a doctor.

Skin

Remove contaminated clothing. Wash skin thoroughly with soap and water. See a doctor if irritation occurs. Launder contaminated clothing.

Inhalation

If there are signs or symptoms due to breathing this material as described in this MSDS, move the person to fresh air. If any of these effects continue, see a doctor.

Ingestion

If swallowed, give water or milk to drink and telephone for medical advice. DO NOT make person vomit unless directed to do so by medical personnel. If medical advice cannot be obtained, then take the person and product container to the nearest medical emergency treatment center or hospital.

ADDITIONAL HEALTH DATA

See Page 3.

SPECIAL PROTECTIVE INFORMATION

Eye Protection: Do not get in eyes. Eye contact can be avoided by wearing chemical safety goggles.
Skin Protection: Avoid contact with skin or clothing. Skin contact can be minimized by wearing impervious protective clothing including gloves.
Respiratory Protection: This material may be an inhalation hazard and, unless ventilation is adequate, the use of an approved respirator is recommended.
Ventilation: Use this material only in well ventilated areas.
Comment: If you experience any of the signs or symptoms described in this MSDS, you may be exposed to harmful levels of this product. Your exposure can be minimized if you follow the protective measures presented above.

FIRE PROTECTION

Liquid evaporates and forms vapor (fumes) which can catch fire and burn with explosive violence. Invisible vapor spreads easily and can be set on fire by many sources such as pilot lights, welding equipment, and electrical motors and switches. Fire hazard is greater as liquid temperature rises above 85°F.
Flash Point: (TCC)100°F(38°C (Min.)
Autoignition Temp.: NDA
Flammability Limits: NDA
Extinguishing Media: CO_2, Dry Chemical, Foam, Water Fog
Special Fire Fighting Procedures: For fires involving this material, do not enter any enclosed or confined fire space without proper protective equipment. This may include self-contained breathing apparatus to protect against the hazardous effects of normal products of combustion or oxygen deficiency. Read the entire MSDS.

SPECIAL PRECAUTIONS

See Page 3.

ENVIRONMENTAL PROTECTION

Environmental Impact: This material is not expected to present any environmental problems other than those associated with oil spills.
Precautions if Material is Released or Spilled: Eliminate all open flame in vicinity of spill or released vapor. Stop the source of the leak or release. Clean up releases as soon as possible, observing precautions in Special Protective Information. Contain liquid to prevent further contamination of soil, surface water or groundwater. Clean up small spills using appropriate techniques such as sorbent materials or pumping. Where feasible and appropriate, remove contaminated soil. Follow prescribed procedures for reporting and responding to larger releases.
Waste Disposal Methods: Place contaminated materials in disposable containers and dispose of in a manner consistent with applicable regulations. Contact local environmental or health authorities for approved disposal of this material.

REACTIVITY DATA

Stability (Thermal, Light, etc.): Stable.
Incompatibility (Materials to Avoid): May react with strong oxidizing materials.
Hazardous Decomposition Products: Normal combustion forms carbon dioxide and water vapor; incomplete combustion can produce carbon monoxide.
Hazardous Polymerization: Will not occur.

PHYSICAL PROPERTIES

Solubility: Insoluble in water; miscible with hydrocarbons.
Appearance (Color, Odor, etc.): Pale yellow liquid.
Boiling Point: 215-288°C (Range)
Melting Point: n/a
Specific Gravity: 0.85 @ 15.6/15.6°C (Min.)
Vapor Pressure: NDA
Vapor Density (Air=1): NDA
Percent Volatile (Volume %): NDA
Evaporation: NDA
Viscosity: 1.3 cSt @ 40°C (Min.)

n/a = Not Applicable
NDA = No Data Available

Material Safety Data Sheet

CHEVRON Diesel Fuel No. 1 CPS 270003

ADDITIONAL HEALTH DATA

Signs and symptoms of central nervous system effects may include one or more of the following: headache, dizziness, loss of appetite, weakness and loss of coordination. Affected persons usually experience complete recovery when removed from the exposure area.

This product contains a petroleum mid-distillate. Toxicology data from studies on similar hydrocarbon mid-distillates indicate that lifetime application to the skin of mice resulted in a low-level skin carcinogenicity response characterized by low tumor incidence and long latency.

Brief or intermittent skin contact with this product is not expected to produce any serious effects if it is washed from the skin. While normal handling of this product is not likely to cause cancer in humans, skin contact and breathing of mists, fumes or vapors should be reduced to a minimum. We strongly recommend that the precautions outlined in this MSDS be followed when handling this material.

This product is similar to some jet fuels. Reports in the literature conclude that long-term exposure to jet fuels may result in changes in 1) the incidence and prevalence of psychiatric symptoms 2) psychological tests and 3) EEGs. These studies were conducted in specific work situations where there were exposures to jet fuels. We have reviewed these studies and it is our opinion that the work situations are too complex and the analytical methods that define brain damage are too imprecise to state with scientific certainty that either the condition occurs or that it was due to the type of material discussed in this MSDS. Since this product contains chemicals which are similar to those used in the work situations discussed above, it should be handled strictly in accordance with the instructions on the product label and in this MSDS in order to minimize the occurrence of any adverse health effects.

SPECIAL PRECAUTIONS

READ AND OBSERVE ALL PRECAUTIONS ON PRODUCT LABEL.

DO NOT USE OR STORE near flame, sparks or hot surfaces. USE ONLY IN WELL VENTILATED AREA. Keep container closed.

DO NOT weld, heat or drill container. Replace cap or bung. Emptied container still contains hazardous or explosive vapor or liquid.

CAUTION! Do not use pressure to empty drum or explosion may result.

WARNING! Not for use as portable heater or appliance fuel. Toxic fumes may accumulate and cause death.

Material Safety Data Sheet

Prepared According to the OSHA Hazard Communication Standard (29 CFR 1910.1200).
(Formerly Called MATERIAL INFORMATION BULLETIN)

CHEVRON Diesel Fuel No. 2 **CPS 272102**

DANGER! HARMFUL OR FATAL IF SWALLOWED
PROLONGED OR REPEATED CONTACT WITH SKIN MAY BE HARMFUL
MAY CAUSE SKIN IRRITATION
COMBUSTIBLE
KEEP OUT OF REACH OF CHILDREN

TYPICAL COMPOSITION

Fuels, Diesel No. 2 (CAS 68476-34-6) 100%

EXPOSURE STANDARD

No Federal OSHA exposure standard or ACGIH TLV has been established for this material.

PHYSIOLOGICAL & HEALTH EFFECTS

Eyes

Expected to cause no more than minor eye irritation.

Skin

May cause skin irritation. Application of a similar material onto the skin of rabbits produced moderate to severe skin irritation. Prolonged or repeated skin contact may be harmful. See Additional Health Data.

Inhalation

Prolonged breathing of high vapor concentrations can cause central nervous system effects. See Additional Health Data.

Ingestion

Not expected to have acute systemic toxicity by ingestion. **Note to Physician:** Ingestion of this product or subsequent vomiting can result in aspiration of light hydrocarbon liquid which can cause pneumonitis.

EMERGENCY & FIRST AID PROCEDURES

Eyes

Flush eyes immediately with fresh water for at least 15 minutes while holding the eyelids open. If irritation persists, see a doctor.

Skin

Remove contaminated clothing. Wash skin thoroughly with soap and water. See a doctor if irritation occurs. Launder contaminated clothing.

Inhalation

If there are signs or symptoms due to breathing this material as described in this MSDS, move the person to fresh air. If any of these effects continue, see a doctor.

Ingestion

If swallowed, give water or milk to drink and telephone for medical advice. DO NOT make person vomit unless directed to do so by medical personnel. If medical advice cannot be obtained, then take the person and product container to the nearest medical emergency treatment center or hospital.

ADDITIONAL HEALTH DATA
See following pages

SPECIAL PROTECTIVE INFORMATION
Eye Protection: Do not get in eyes. Eye contact can be avoided by wearing chemical safety goggles.
Skin Protection: Avoid contact with skin or clothing. Skin contact can be minimized by wearing impervious protective clothing including gloves.
Respiratory Protection: This material may be an inhalation hazard, and unless ventilation is adequate, the use of an approved respirator is recommended.
Ventilation: Use this material only in well ventilated areas.

FIRE PROTECTION
Liquid evaporates and forms vapor (fumes) which can catch fire and burn with explosive violence. Invisible vapor spreads easily and can be set on fire by many sources such as pilot lights, welding equipment, and electrical motors and switches. Fire hazard is greater as liquid temperature rises above 85°F.
Flash Point: (P-M)125°F(52°C)
Autoignition Temp.: NDA
Flammability Limits: n/a
Extinguishing Media: CO_2, Dry Chemical, Foam, Water Fog.
Special Fire Fighting Procedures: For fires involving this material, do not enter any enclosed or confined fire space without proper protective equipment. This may include self-contained breathing apparatus to protect against the hazardous effects of normal products of combustion or oxygen deficiency. Read the entire MSDS.

SPECIAL PRECAUTIONS
See following pages

ENVIRONMENTAL PROTECTION
Environmental Impact: This material is not expected to present any environmental problems other than those associated with oil spills.
Precautions if Material is Released or Spilled: Eliminate all open flame in vicinity of spill or released vapor. Stop the source of the leak or release. Clean up releases as soon as possible, observing precautions in Special Protective Information. Contain liquid to prevent further contamination of soil, surface water or groundwater. Clean up small spills using appropriate techniques such as sorbent materials or pumping. Where feasible and appropriate, remove contaminated soil. Follow prescribed procedures for reporting and responding to larger releases.
Waste Disposal Methods: Place contaminated materials in disposable containers and dispose of in a manner consistent with applicable regulations. Contact local environmental or health authorities for approved disposal of this material.

REACTIVITY DATA
Stability (Thermal, Light, etc.): Stable.
Incompatibility (Materials to Avoid): May react with strong oxidizing materials.
Hazardous Decomposition Products: Normal combustion forms carbon dioxide and water vapor; incomplete combustion can produce carbon monoxide.

PHYSICAL PROPERTIES
Solubility: Miscible with hydrocarbons; insoluble in water.
Appearance (Color, Odor, etc.): Pale yellow liquid
Boiling Point: 157-371°C (315-700°F)
Melting Point: n/a
Specific Gravity: 0.82 @ 15.6/15.6°C (Typical)
Vapor Pressure: 0.04 psia @ 40°C
Vapor Density (Air=1): NDA
Percent Volatile (Volume %): NDA
Evaporation: NDA
Viscosity: 1.9 cSt @ 40°C (Min.)

n/a = Not Applicable
NDA = No Data Available

Material Safety Data Sheet

CHEVRON Diesel Fuel No. 2 CPS 272102

ADDITIONAL HEALTH DATA

Signs and symptoms of central nervous system effects may include one or more of the following: headache, dizziness, loss of appetite, weakness and loss of coordination. Affected persons usually experience complete recovery when removed from the exposure area.

This product contains a petroleum mid-distillate. Toxicology data from studies on similar hydrocarbon mid-distillates indicate that lifetime application to the skin of mice resulted in a low-level skin carcinogenicity response characterized by low tumor incidence and long latency. Other similar materials caused gene mutations in the Mouse Lymphoma Assay and in the Rat Bone Marrow Assay.

SPECIAL PRECAUTIONS

READ AND OBSERVE ALL PRECAUTIONS ON PRODUCT LABEL.

Contains Petroleum Distillate.

DO NOT USE OR STORE near flame, sparks or hot surfaces. USE ONLY IN WELL VENTILATED AREA. Keep container closed.

DO NOT weld, heat or drill container. Replace cap or bung. Emptied container still contains hazardous or explosive vapor or liquid.

CAUTION! Do not use pressure to empty drum or explosion may result.

WARNING! Not for use as portable heater or appliance fuel. Toxic fumes may accumulate and cause death.

NFPA RATINGS:

Health 1; Flammability 2; Reactivity 0.

HMIS Hazard Ratings:

Health 2; Flammability 2; Reactivity 0.

This product contains a toxic chemical or chemicals listed below which are subject to the reporting requirements of section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR Part 372.

Chemical	CAS #	% Composition
Benzene	71-43-2	0.002-0.011

March 14, 1989

Ms. Katherine Chesick
Alameda County Health Department
Hazardous Materials Division
80 Swan Way, Room 200
Oakland, California 94621

RE: Modifications to the Site Characterization of the Excavated Fuel Tanks Area Work Plan for the Carnation Dairy Facility located at 1310 14th Street in Oakland, California

AGE Project No. 004-88-059

Dear Ms. Chesick:

AGE has received the letter dated March 6, 1989 approving the Site Characterization Work Plan for the Excavated Fuel Tank Area at the Carnation Dairy Facility in Oakland. At the time the Work Plan was prepared, not all of the information now known concerning the site was available. This letter addresses the revisions to the Work Plan based on findings to date.

Based on drilling the 37 product recovery points, the soil in the area is a silty sand. The clay layer originally anticipated at approximately 15 feet below ground surface was not encountered. The clay in the tank excavation does not appear to be laterally continuous and may have been placed at the time the tanks were originally put into service. The absence of the clay and the presence of the sand requires deepening the monitoring wells.

Three stratigraphic borings (MW-1, MW-2, and MW-4) will be continuously cored to a maximum depth of 50 feet or no more than three feet into any competent clay layer. Figure 1 is a revised site plan with the tentative monitoring well locations. Two more borings are planned in the area with floating product (MW-3 and MW-8) and will be continuously cored. Total depth for these borings will not exceed 25 feet below ground surface in order to prevent creating a conduit for the downward migration of the contamination. MW-8 is located inside the building and depending on conditions encountered in the field this boring may be continuously cored.

The monitoring well construction has been revised to reflect the sandy soil and the constraints caused by drilling inside the building. The ten monitoring wells located outside the building will be four-inch diameter wells. The remaining five wells to be installed inside the building will be two-inch diameter wells. The well diameter was reduced because the maximum auger size of the drill rig which can operate inside the building is 3.75 inches (inside diameter).

The well screen and filter pack size have been designed as a result of the silty sands encountered at the site. A washed sieve analysis was performed on a representative soil sample from the product recovery points. The engineered well design requires a #30 slot screen and #3 Monterey sand. This well design will be used for all of the monitoring wells. The screen and sand size will allow free product to enter the well. Figure 2 shows the revised monitoring well construction design.

As agreed in our telephone of March 13, 1989, the monitoring wells will be developed by swabbing and pumping at least five well volumes. The wells will be allowed to equilibrate for 24 to 48 hours prior to measuring the water level and any product thickness. In this initial sampling round, the wells will be sampled as they are completed. In future sampling events, the water levels and product thicknesses will be measured prior to obtaining any groundwater samples.

AGE will submit selected samples in the vicinity of the waste oil tank for analyses for oil and grease, volatile organics, and semi-volatile organics by methods 503D and E, 8240, and 8270. The 8240 and 8270 analyses will be submitted through Precision Analytical Laboratory to a laboratory certified to perform these analyses. In addition, the total petroleum hydrocarbons analyses will be performed using both diesel and gasoline standards.

The site safety plan will be revised. A map to the nearest hospital and written directions are included in the document. A copy has been been enclosed for your information and files. Full face respirators will be available onsite in a convenient location. During drilling operations, continuous air monitoring will be conducted using a Bacharach TLV Sniffer.

As discussed, drilling will begin on the monitoring wells located outside the building on Wednesday, March 15, 1989. Drilling inside the building is tentatively scheduled to begin on Friday, March 17, 1989. Two different drill rigs will be used to install the 15 monitoring wells. A smaller rig is required for the five wells located in the building due to limited access inside the building.

AGE appreciates your prompt response and cooperation in reviewing and approving this Work Plan. In addition, your advice, comments

and observations concerning this project have been very helpful. If you have any questions please contact Mary Scruggs at (916) 631-0154.

Prepared By:

Mary L. Scruggs
Project Manager

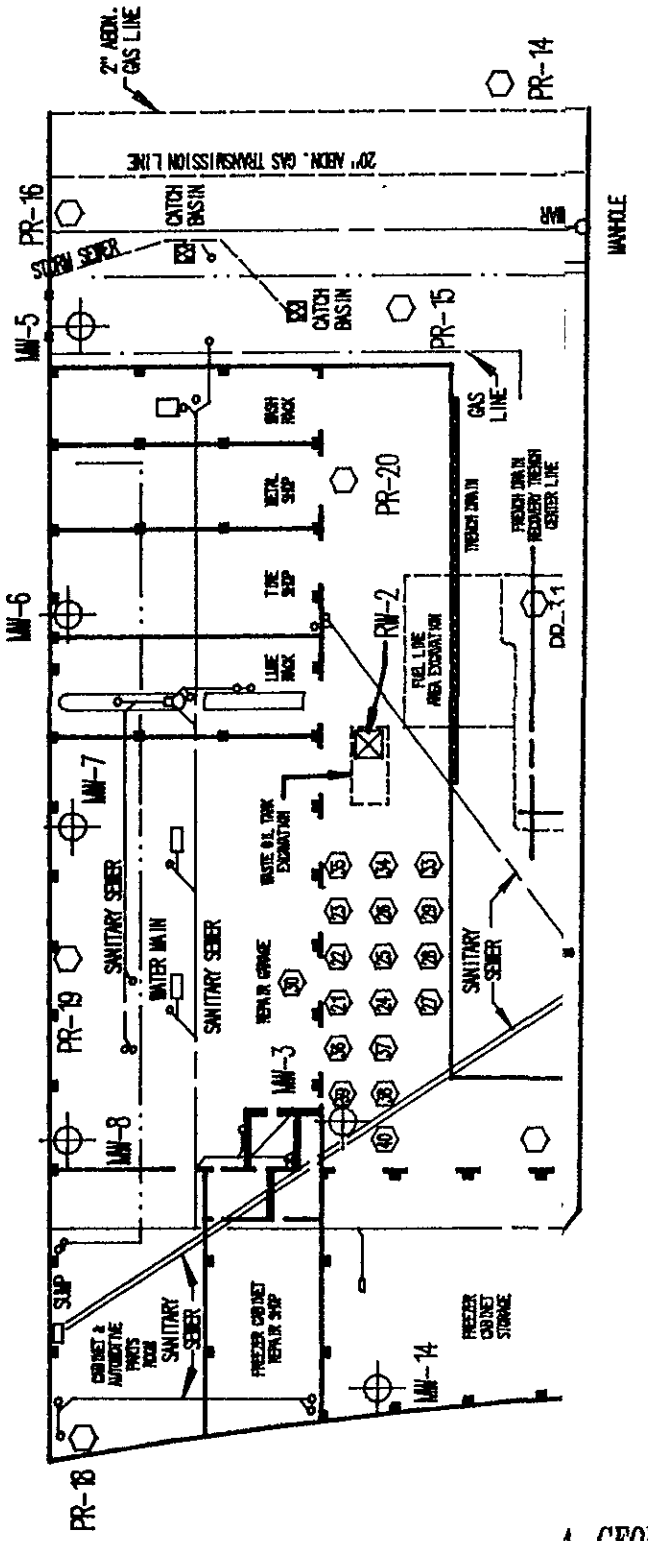
Reviewed By:

Karl J Anania
California Registered Geologist No. 4306

cc: Howard Shmuckler, Carnation
Jim Person, Carnation
Don Dalke, RWQCB
Lisa McCann, RWQCB

MLS/KJA/jc

FIGURE 1



N

0 21 42

LEGEND

RECOVERY WELL	⊠ RW-1
PRODUCT RECOVERY POINT	⬡ PR-1
PROPOSED MONITORING WELL	⊕ MW-1

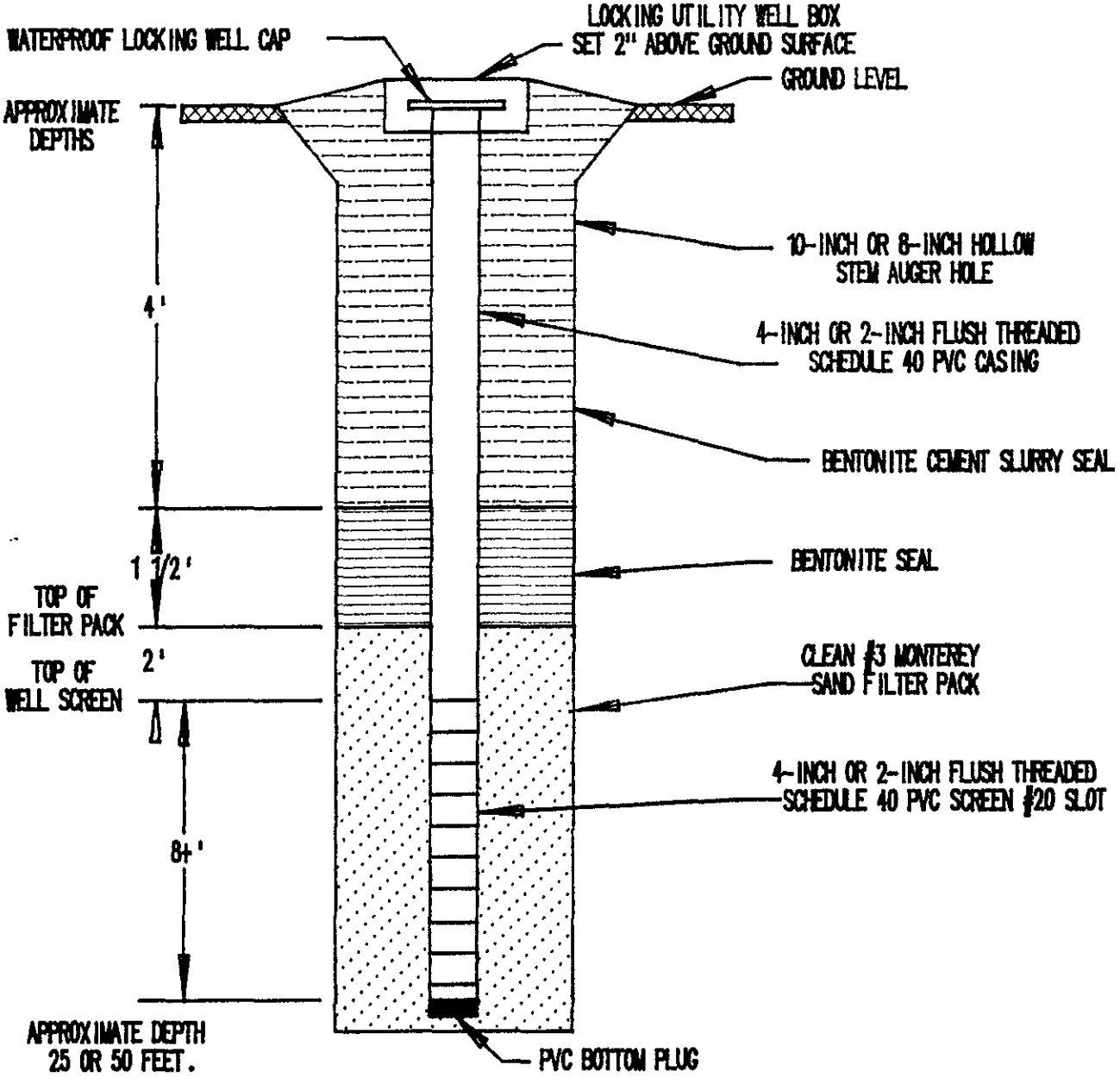
AGE
A GEOLOGIC ENGINEERING

PROJECT NO: 004-88-059

T POPLAR OAKLAND, CA.

/	CHECKED BY	APPROVED BY	SCALE

FIGURE 2



AGE
ANANIA GEOLOGIC ENGINEERING

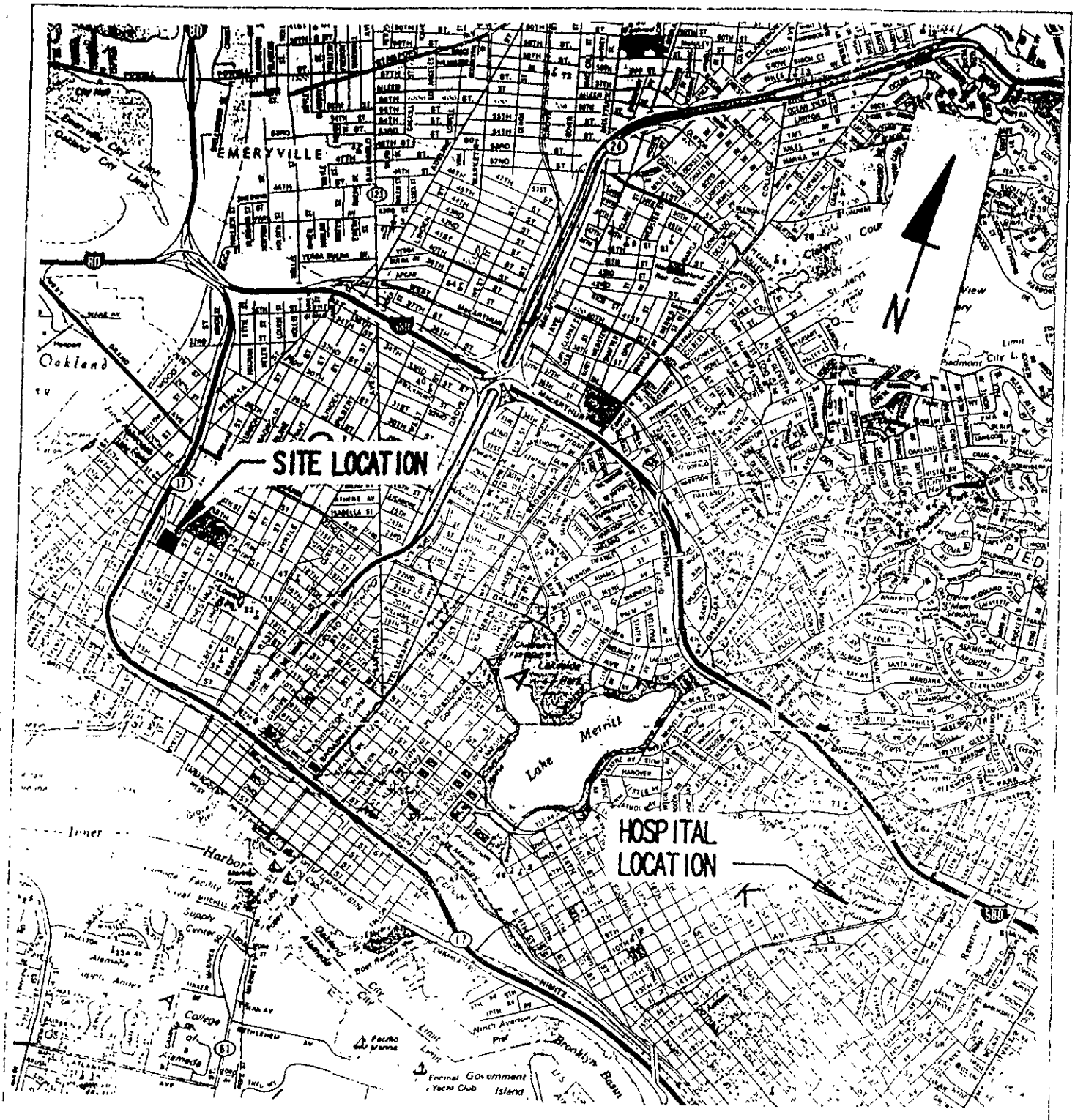
TITLE: MONITORING WELL CONSTRUCTION DETAIL					
PROJECT NAME: CARNATION/OAKLAND				PROJECT NO: 004-88-059	
SITE LOCATION: 1310 14th ST. AT POPLAR ST. OAKLAND					
REV. NO.	DATE	DRAWING BY	CHECKED BY	APPROVED BY	SCALE
	3-14-89	CHRIS DIDIO			NONE

Directions from Carnation Site to Highland Hospital

1. Turn right out of the gate from the site.
2. Turn right on Poplar.
3. Turn left on 14th Street.
4. Turn right on Brush, go a few blocks.
5. Take I-980 West. I-980 turns into 880 South to San Jose. Go 3 or 4 exits.
6. Take 16th Avenue exit - go about 1 block.
7. Turn left on Embarcadero.
8. Turn left on 16th Avenue overpass.
9. Turn left on East 12th Avenue.
10. Turn right on 14th Avenue; go approximately 1-1/2 miles.
11. Turn left on East 31st Avenue.

The Emergency room is down East 31st at Stuart Street.

2/22/89
emergncy.059



AGE
ANANIA GEOLOGIC ENGINEERING

TITLE: SITE LOCATION MAP					
PROJECT NAME: CARNATION/OAKLAND				PROJECT NO: 004-88-059	
SITE LOCATION: 1310 14th ST. AT POPLAR ST. OAKLAND					
FIG. NO.	DATE	DRAWING BY	CHECKED BY	APPROVED BY	SCALE
4	2-13-89	CHRIS DIDIO			NONE

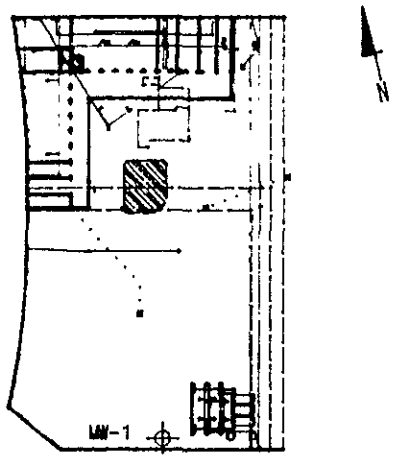
APPENDIX B

Boring Logs

ANANIA GEOLOGIC ENGINEERING

BORING LOG

LOCATION OF BORING

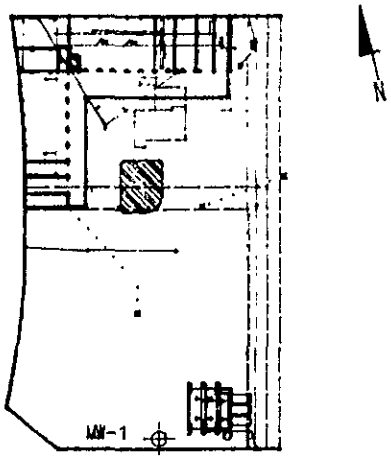


SITE/LOCATION	CARNATION/OAKLAND				BORING NO. MW-1
PROJECT NO.	004-88-059				
WATER LEVEL					SHEET 1 OF 3
TIME					DRILLER
DATE					START / FINISH
CASING DEPTH ESTIMATED					TIME 8:50 / TIME 11:50
DRILLING CONTRACTOR	PC EXPLORATION				DATE 3-15-89 / DATE 3-15-89
DRILLER	MIKE MOORE				
DRILLING METHOD	HOLLOW STEM AUGER				
SAMPLING METHOD	MPS				
LOGGER	ERIC HOLM				
N/S N 2227.7	E/W E 3067.1			ELEV. 16.82	
BORING DIAMETER: 10 INCHES				WELL CASING DIAMETER: 4 INCHES	
REVIEWED BY:				DATE	

DIST. FROM SURF.	WELL CONST. CASING	WELL CONST. ANNULUS	LEGEND	TLV READING	SAMPLE NO.	RECOVERY	BLOWS PER 6 IN.	USCS	LOG OF MATERIAL
						X	5		ASPHALT
		4# BENTONITE CEMENT SLURRY				X	5	GP	GRAVELY SAND- BLACKISH BROWN, CLASTS ARE ANGULAR 3/4" GRAY, QUARTZ,
1				0		X	5		MAFICS, SLIGHTLY MOIST, SLIGHTLY PLASTIC, MEDIUM DENSE,
						X	5		NO ODOR.
2						X	6		
				0		X	7		
3						X	6		
						X	8		SILTY SAND- REDDISH BROWN, AREAS OF OXIDATION, QUARTZ, MAFICS,
4						X	8		SLIGHTLY MOIST, SLIGHTLY PLASTIC, MEDIUM DENSE,
	BLANK	3/8" BENT. PELLETS		0	3649	X	5		NO ODOR.
5						X	7		
						X	7		
6				0		X	7		
						X	6		
7						X	10		
						X	5		
8				0		X	5		
						X	10		
9						X	7		SILTY SAND- REDDISH BROWN, AREAS OF OXIDATION, QUARTZ, MAFICS,
				0	3650	X	8	SM	SLIGHTLY MOIST, SLIGHTLY PLASTIC, MEDIUM DENSE,
10						X	10		NO ODOR.
						X	10		
11						X	10		
						X	15		SILTY SAND- REDDISH BROWN, AREAS OF OXIDATION, QUARTZ, MAFICS,
12						X	9		WET, MEDIUM DENSE, NO ODOR.
	0.030 INCH SLOT	COURSE AQUARIUM SAND				X	11		
13						X	14		
						X	6		
14						X	7		
						X	7		
15						X	5		
						X	5		
16						X	7		
						X	6		
17						X	6		
						X	7		
18						X	7		
						X	88		
19							8		
20									

ANANIA GEOLOGIC ENGINEERING — BORING LOG

LOCATION OF BORING

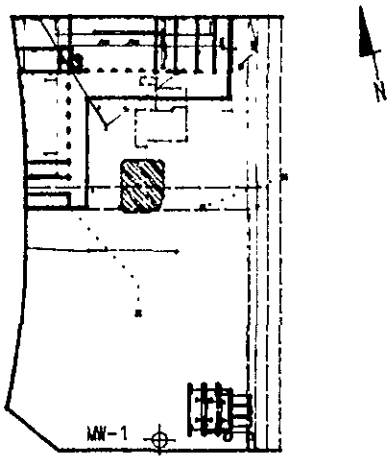


SITE/LOCATION	CARNATION/OAKLAND				BORING NO. MW-1
PROJECT NO.	004-88-059				SHEET 2 OF 3
WATER LEVEL					DRILLER
TIME					START TIME 8:50 / FINISH TIME 11:50
DATE					
CASING DEPTH ESTIMATED					
DRILLING CONTRACTOR	PC EXPLORATION				DATE 3-15-89 / DATE 3-15-89
DRILLER	MIKE MOORE				
DRILLING METHOD	HOLLOW STEM AUGER				
SAMPLING METHOD	MPS				
LOGGER	ERIC HOLM				
N/S	N 2227.7	E/W	E 3057.1	ELEV.	16.82
BORING DIAMETER:	10 INCHES			WELL CASING DIAMETER:	4 INCHES
REVIEWED BY:				DATE	

DIST. FROM SURF.	WELL CONST. CASING	WELL CONST. ANNULUS	LEGEND	TLV READING	SAMPLE NO.	RECOVERY	BLOWS PER 6 IN.	USCS	LOG OF MATERIAL
						X	18	SP	MEDIUM/COARSE SAND- TRACE OF SILT, GREENISH BROWN, AREAS OF
						X	19		OXIDATION, QUARTZ, MAFICS, WET, NON-PLASTIC,
21							20		DENSE, NO ODOR.
						X	20	SM	
22						X	25		SILTY SAND- LIGHT BROWN, AREAS OF OXIDATION, QUARTZ, MAFICS,
						X	20		WET, NON-PLASTIC, DENSE, NO ODOR.
23						X	21		
						X	27		
24						X	20		
						X	20		
25						X	20		
						X	20		
26						X	21		
						X	23		
27						X	25		
						X	30		
28						X	30		
						X	32		
29	0.020 INCH SLOT	#3 SAND				X	33		
						X	33		
30						X	32	SP	MEDIUM SAND- BROWN, SOME SILT, QUARTZ, MAFICS, WET, NON-PLASTIC,
						X	33		VERY DENSE, NO ODOR.
31						X	30	SM	
						X	30		
32						X	33		
						X	35		SILTY SAND- LIGHT BROWN, QUARTZ, MAFICS, WET, NON-PLASTIC,
33						X	30		VERY DENSE, NO ODOR.
						X	31		
34							32		
							28		
35						X	32	SM	
						X	34		
36						X	29		
						X	22		
37						X	29		
						X	30		
38						X	30		
						X	31		
39						X	32		SILTY SAND- LIGHT BROWN, QUARTZ, MAFICS, WET, NON-PLASTIC,
40						X	30		VERY DENSE, NO ODOR.

ANANIA GEOLOGIC ENGINEERING — BORING LOG

LOCATION OF BORING



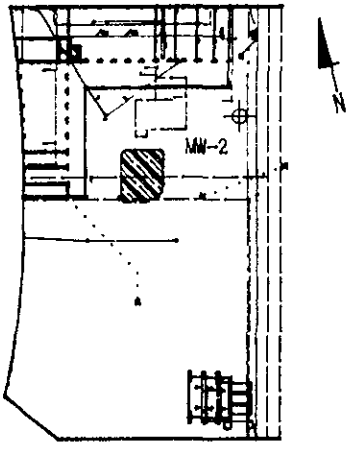
SITE/LOCATION	CARNATION/OAKLAND				BORING NO. MW-1
PROJECT NO.	004-88-059				SHEET 3 OF 3
WATER LEVEL					DRILLER
TIME					START TIME 8:50 / FINISH TIME 11:50
DATE					
CASING DEPTH ESTIMATED					DATE 3-15-89 / DATE 3-15-89
DRILLING CONTRACTOR	PC EXPLORATION				
DRILLER	MIKE MOORE				
DRILLING METHOD	HOLLOW STEM AUGER				
SAMPLING METHOD	MPS				
LOGGER	ERIC HOLM				
N/S N 2227.7	E/W E 3057.1			ELEV. 16.82	
BORING DIAMETER: 10 INCHES				WELL CASING DIAMETER: 4 INCHES	
REVIEWED BY:				DATE	

DIST. FROM SURF.	WELL CONST. CASING	WELL CONST. ANNULUS	LEGEND	TLV READING	SAMPLE NO.	RECOVERY	BLOWS PER 6 IN.	USCS	LOG OF MATERIAL
						X	29		
							33		
41							31		
						X	32		
42						X	31		
	0.030 INCH SLOT					X	31		
43		#3 SAND				X	28		
						X	29		
44							31		
							34		SILTY SAND- LIGHT BROWN, QUARTZ, MAFICS, WET, NON-PLASTIC,
45						X	27	SM	VERY DENSE ,NO ODOR.
						X	29		
46						X	30		
						X	33		SILTY SAND- LIGHT BROWN, QUARTZ, MAFICS, WET, NON-PLASTIC,
47								TD	VERY DENSE ,NO ODOR.
									SAMPLE COULD NOT BE RETAINED AFTER 4 ATTEMPTS WITH SAND CATCHER.
									2 BAGS OF CEMENT
									1-5 GAL. BUCKET OF BENTONITE PELLETS.
									14 1/2 BAGS OF #3 SAND.

ANANIA GEOLOGIC ENGINEERING

BORING LOG

LOCATION OF BORING



SITE/LOCATION	CARNATION/OAKLAND
PROJECT NO.	004-68-059
WATER LEVEL	
TIME	
DATE	
CASING DEPTH	
DRILLING CONTRACTOR	PC EXPLORATION
DRILLER	MIKE MOORE
DRILLING METHOD	HOLLOW STEM AUGER
SAMPLING METHOD	MPS
LOGGER	ERIC HOLM
N/S	N 2500.9
E/W	E 3233.9
ELEV.	15.52
BORING DIAMETER:	10 INCHES
WELL CASING DIAMETER:	4 INCHES
REVIEWED BY:	DATE

BORING NO. MW-2

SHEET 1 OF 2

DRILLER

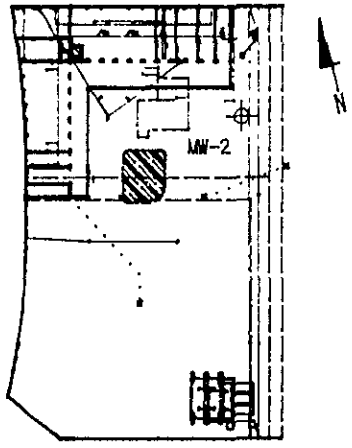
START	FINISH
TIME 7:30	TIME 12:00
DATE 3-17-89	DATE 3-17-89

DIST. FROM SURF.	WELL CONST. CASING	WELL CONST. ANNULUS	LEGEND	TLV READING	SAMPLE NO.	RECOVERY	BLOWS PER 6 IN.	USCS	LOG OF MATERIAL
									ASPHALT
1								GM	
									GRAVEL
2		4% BENTONITE CEMENT SLURRY		120		X	5		FINE SAND- GREENISH GRAY, QUARTZ, MAFICS, SLIGHTLY MOIST, NON-
						X	5		PLASTIC, LOOSE, SLIGHT ODOR.
3						X	4		
	BLANK					X	5		
4						X	5		
		3/8" BENT. PELL.		320	3838	X	6		SILTY SAND- VEINS OF GRAY CLAY, ORGANICS (?) CENTER OF VEINS,
5						X	7		CLAY VEINS ARE VERTICAL, QUARTZ, MAFICS, MOIST, SLIGHTLY
						X	10		PLASTIC, MEDIUM DENSE, ODOR.
6						X	11		
				140		X	14		SILTY SAND- REDDISH BROWN, QUARTZ, MAFICS, SLIGHTLY MOIST, NON-
7						X	8		PLASTIC, MEDIUM DENSE, ODOR.
						X	9		
				190		X	9		
8					3839	X	10		
						X	11		
9				70		X	12		
						X	8	SM	
10						X	9		
		#3 SAND		50		X	9		SILTY SAND- TRACES OF CLAY, REDDISH BROWN, QUARTZ, MAFICS,
11						X	8		SLIGHTLY MOIST, NON-PLASTIC, MEDIUM DENSE, ODOR.
						X	8		
12				50		X	7		SILTY SAND- REDDISH BROWN, AREAS OF GRAY SAND, AREAS OF OXIDATION,
						X	7		QUARTZ, MAFICS, WET, SLIGHTLY PLASTIC, MEDIUM DENSE,
13	0.030 INCH SLOT					X	7		NO ODOR.
14				150		X	7		
						X	8		
						X	7		
15				20		X	8		SILTY SAND- REDDISH BROWN, AREAS OF GRAY SAND, AREAS OF OXIDATION,
						X	6		SOME SMALL AREAS OF GRAY CLAY, QUARTZ, MAFICS, WET,
16						X	8		SLIGHTLY PLASTIC, MEDIUM DENSE, NO ODOR.
				20		X	5		
17						X	7		
						X	8		
18				25		X	9		
						X	7		
19						X	9		
20						X	9		

ANANIA GEOLOGIC ENGINEERING

BORING LOG

LOCATION OF BORING



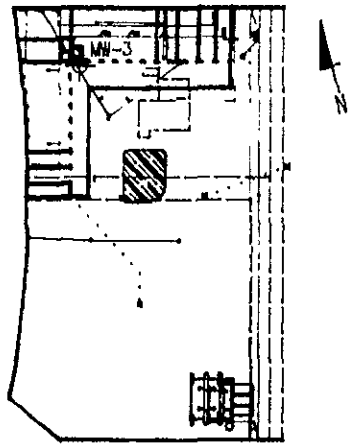
SITE/LOCATION	CARNATION/OAKLAND
PROJECT NO.	004-66-059
BORING NO.	MW-2
SHEET	2 OF 2
WATER LEVEL	
TIME	
DATE	
CASING DEPTH	
DRILLER	START / FINISH
START TIME	7:30
FINISH TIME	12:00
DRILLING CONTRACTOR	PC EXPLORATION
DRILLER	MIKE MOORE
START DATE	3-22-89
FINISH DATE	3-22-89
DRILLING METHOD	HOLLOW STEM AUGER
SAMPLING METHOD	MPS
LOGGER	ERIC HOLM
N/S	N 2500.9
E/W	E 3233.9
ELEV.	15.52
BORING DIAMETER:	10 INCHES
WELL CASING DIAMETER:	4 INCHES
REVIEWED BY:	DATE

DIST. FROM SURF.	WELL CONST. CASING	WELL CONST. SCREEN	LEGEND	TLV READING	SAMPLE NO.	RECOVERY	BLOWS PER 6 IN.	USCS	LOG OF MATERIAL
							9		
						X	9		
21						X	9		
							8		
22							9	SM	
	0.020 INCH SLOT	#3 SAND		10		X	10		MEDIUM SAND- TRACE OF SILT, REDDISH BROWN, AREAS OF GRAY SAND,
23						X	11		AREAS OF OXIDATION, QUARTZ, MAFICS, WET, NON-
						X	8		PLASTIC, MEDIUM DENSE, NO ODOR.
24				12		X	8		
						X	9		
25								TD	
									7 BAGS OF #3 SAND
									2 BAGS OF CEMENT
									1-5 GALLON BUCKET OF BENTONITE

ANANIA GEOLOGIC ENGINEERING

BORING LOG

LOCATION OF BORING



SITE/LOCATION	CARNATION/OAKLAND				BORING NO. MW-3
PROJECT NO.	004-88-059				SHEET 1 OF 2
WATER LEVEL					DRILLER
TIME					START TIME 1:15 / FINISH TIME 4:20
DATE					START DATE 3-21-89 / FINISH DATE 3-21-89
CASING DEPTH					

DRILLING CONTRACTOR: PC EXPLORATION

DRILLER: MIKE MOORE

DRILLING METHOD: HOLLOW STEM AUGER

SAMPLING METHOD: MPS

LOGGER: ERIC HOLM

N/S: N2613.2 E/W: E3114.7 ELEV.: 14.66

BORING DIAMETER: 10 INCHES WELL CASING DIAMETER: 4 INCHES

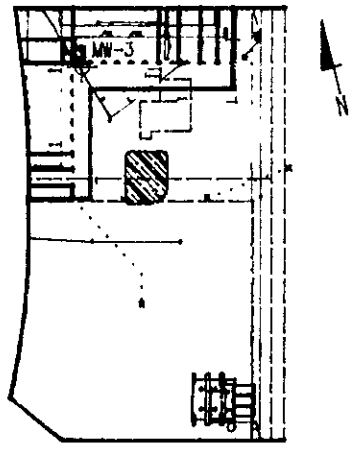
REVIEWED BY: DATE

DIST. FROM SURF.	WELL CONST. CASING	WELL CONST. ANNULUS	LEGEND	TLV READING	SAMPLE NO.	RECOVERY	BLOWS PER 6 IN.	USCS	LOG OF MATERIAL
									ASPHALT
									GRAVEL
1								GM	
2		4% BENTONITE CEMENT SLURRY							
3							5		
	BLANK					X	5		
4				150	3829	X	6		SILTY FINE SAND- GREENISH GRAY, MAFICS, QUARTZ, SLIGHTLY MOIST,
		3/8" BENT. PELL.			3830	X	6		NON-PLASTIC, MEDIUM DENSE, HYDROCARBON ODOR.
5					3831	X	7	SM	
6				220	3832	X	7		SILTY SAND- REDDISH BROWN, QUARTZ, MAFICS, SLIGHTLY MOIST, SLIGHTLY
									PLASTIC, MEDIUM DENSE, HYDROCARBON ODOR.
7									
8						X	8		
						X	6		
9				660	3833	X	8	ML	SANDY SILT- REDDISH BROWN, AREAS OF GRAY, SOME REDDISH OXIDATION,
					3834	X	9		MOIST, PLASTIC, MEDIUM DENSE, HYDROCARBON ODOR.
10									
11		#3 SAND							
12									
13									
14	0.030 INCH SLOT					X	5		
					3835	X	6		
15				45	3836	X	5		SILTY SAND- REDDISH BROWN, MINOR LAMINATIONS, MAFICS, QUARTZ,
					3837	X	6		WET, NON-PLASTIC, MEDIUM DENSE, NO ODOR.
16						X	7		
						X	7	SM	
17									
18									
19				10		X	5		SILTY SAND- REDDISH BROWN, MINOR LAMINATIONS, MAFICS, QUARTZ,
						X	5		WET, NON-PLASTIC, MEDIUM DENSE, NO ODOR.
20						X	6		

ANANIA GEOLOGIC ENGINEERING

BORING LOG

LOCATION OF BORING



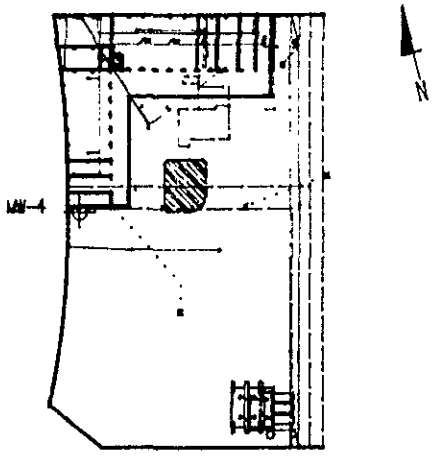
SITE/LOCATION	CARNATION/OAKLAND				BORING NO. MW-3
PROJECT NO.	004-88-059				
WATER LEVEL					SHEET 2 OF 2
TIME					DRILLER
DATE					START / FINISH
CASING DEPTH					TIME 1:15 / TIME 4:20
DRILLING CONTRACTOR	PC EXPLORATION				DATE 3-21-89 / DATE 3-21-89
DRILLER	MIKE MOORE				
DRILLING METHOD	HOLLOW STEM AUGER				
SAMPLING METHOD	MPS				
LOGGER	ERIC HOLM				
N/S	N 2613.2	E/W	E 3114.7	ELEV.	14.66
BORING DIAMETER:	10 INCHES	BORING DIAMETER:	4 INCHES		
REVIEWED BY:		DATE			

DIST. FROM SURF.	WELL CONST. CASING	WELL CONST. ANNULUS	LEGEND	TLV READING	SAMPLE NO.	RECOVERY	BLOWS PER 6 IN.	USCS	LOG OF MATERIAL
21									
22	0.03 INCH SLOT	#3 SAND						SM	
23									
24						X	5		
						X	5		
25				4		X	6		SILTY SAND- REDDISH BROWN, MINOR LAMINATIONS, MAFICS, QUARTZ, WET, NON-PLASTIC, MEDIUM DENSE, NO ODOR.
								TD	
									7 1/2 BAGS OF #3 SAND
									1 1/2 BAGS OF CEMENT
									1-5 GALLON BUCKET OF BENTONITE

ANANIA GEOLOGIC ENGINEERING

BORING LOG

LOCATION OF BORING



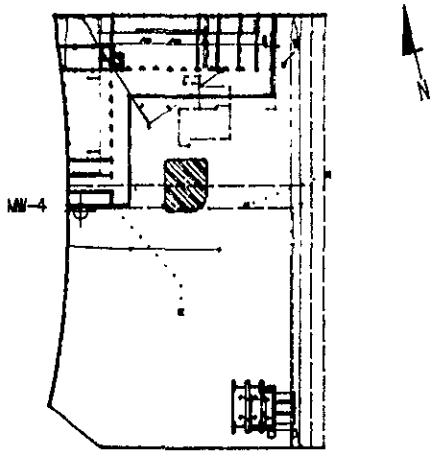
SITE/LOCATION	CARNATION/OAKLAND				BORING NO. MW-4
PROJECT NO.	004-88-059				
WATER LEVEL					SHEET 1 OF 3
TIME					DRILLER
DATE					START: TIME 7:30, DATE 3-15-89 / FINISH: TIME 4:20, DATE 3-15-89
CASING DEPTH ESTIMATED					
DRILLING CONTRACTOR	PC EXPLORATION				
DRILLER	MIKE MOORE				
DRILLING METHOD	HOLLOW STEM AUGER				
SAMPLING METHOD	MPS				
LOGGER	ERIC HOLM				
N/S	N 2484.9	E/W	E 3023.1	ELEV.	14.84
BORING DIAMETER:	10 INCHES	WELL CASING DIAMETER:	4 INCHES		
REVIEWED BY:		DATE			

DIST. FROM SURF.	WELL CONST. CASING	WELL CONST. ANNULUS	LEGEND	TLV READING	SAMPLE NO.	RECOVERY	BLOWS PER 6 IN.	USCS	LOG OF MATERIAL
									ASPHALT
1		4% BENTONITE CEMENT SLURRY				X			
						X	7	GM	GRAVEL AND SAND- (FILL)
2						X	8		
						X	7		
3							8		CERAMIC PIPE PIECES
						X	8		
4	BLANK			25	3681	X	9		
		3/8" BENT. PELLETS				X	7		SILTY SAND- REDDISH BROWN, ORGANICS, QUARTZ, MAFICS, SLIGHTLY
5						X	8		MOIST, NON-PLASTIC, MEDIUM DENSE, NO ODOR.
				21		X	9		
6						X	7		
					3685	X	8		
7					3686	X	8	SM	
				19	3687	X	8		
8							6		
						X	7		
9							8		
				19	3682	X	10		
10						X	10		
						X	7		
11						X	8		
				18	3688	X	8		
12					3689	X	7	SP	MEDIUM SAND- SOME SILT, REDDISH BROWN, AREAS OF GRAY, QUARTZ, MAFICS,
					3670	X	8		WET, NON-PLASTIC, MEDIUM DENSE, NO ODOR.
13	0.030 INCH SLOT			9		X	9		
						X	8		
14						X	7		SILTY SAND- REDDISH BROWN, AREAS OF GRAY CLAY, QUARTZ, MAFICS,
						X	9		WET, NON-PLASTIC, MEDIUM DENSE, NO ODOR.
15		COURSE AQUARIUM SAND		0		X	8	SM	
						X	8		
16						X	8		
						X	7		MEDIUM SAND- SOME SILT, REDDISH BROWN, AREAS OF OXIDATION, QUARTZ,
17				0		X	7		MAFICS, WET, NON-PLASTIC, MEDIUM DENSE, NO ODOR.
							7		
18							8	SP	
				2		X	9		
19						X	80		
						X	7		
20				0		X	8		

ANANIA GEOLOGIC ENGINEERING

BORING LOG

LOCATION OF BORING



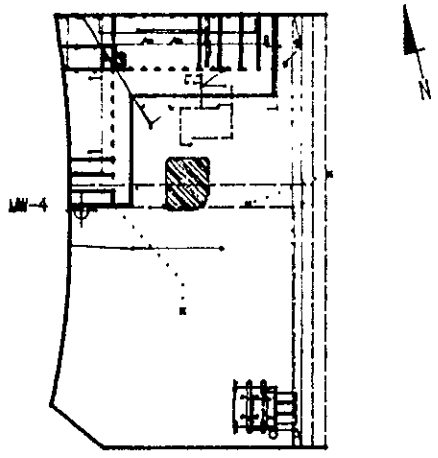
SITE/LOCATION	CARNATION/OAKLAND				BORING NO. MW-4
PROJECT NO.	004-88-059				SHEET 2 OF 3
WATER LEVEL					DRILLER
TIME					START: TIME 7:30; FINISH: TIME 4:20
DATE					DATE 3-20-89; DATE 3-20-89
CASING DEPTH ESTIMATED					
DRILLING CONTRACTOR	PC EXPLORATION				
DRILLER	MIKE MOORE				
DRILLING METHOD	HOLLOW STEM AUGER				
SAMPLING METHOD	MPS				
LOGGER	ERIC HOLM				
N/S N 2484.9	E/W E 3023.1			ELEV. 14.84	
BORING DIAMETER: 10 INCHES				WELL CASING DIAMETER: 4 INCHES	
REVIEWED BY:				DATE	

DIST. FROM SURF.	WELL CONST. CASING	WELL CONST. ANNULUS	LEGEND	TLV READING	SAMPLE NO.	RECOVERY	BLOWS PER 6 IN.	USCS	LOG OF MATERIAL
20						X	8	SP	
						X	9		
21				0		X	9		
						X	10		
22						X	11	SM	
				3		X	9		SILTY SAND- REDDISH BROWN, AREAS OF OXIDATION, QUARTZ, MAFICS,
23						X	8		WET, SLIGHTLY PLASTIC, MEDIUM DENSE, NO ODOR.
						X	7		
24				6		X	9		
							10		
25							5		
				0		X	5		
26						X	6		
						X	5		
27				2		X	5		
							6		
28							5	SP	MEDIUM SAND- REDDISH BROWN, AREAS OF GREEN GRAY SAND, QUARTZ, MAFICS,
	0.020 INCH SLOT	#3 SAND		0		X	6		WET, NON-PLASTIC, MEDIUM DENSE, NO ODOR.
29						X	6		
						X	7		
30				0		X	6		
						X	7		
31						X	5		
							6	SM	SILTY SAND- REDDISH BROWN, AREAS OF OXIDATION, QUARTZ, MAFICS, WET,
32						X	5		SLIGHTLY PLASTIC, LOOSE, MEDIUM DENSE, NO ODOR.
				0		X	5		
33						X	6		
						X	5		
34							5		TRACE OF PEBBLES
				3		X	5		
35						X	5		
						X	6		
36							6	SM	FINE SAND- GREENISH GRAY, AREAS OF OXIDATION, QUARTZ, MAFICS, WET,
				2		X	6		NON-PLASTIC, MEDIUM DENSE, NO ODOR.
37						X	5		
						X	5		
38							6		SILTY SAND- GREENISH GRAY, AREAS OF OXIDATION, QUARTZ, MAFICS,
				7		X	6		WET, SLIGHTLY PLASTIC, MEDIUM DENSE, NO ODOR.
39						X	5		
40							6		

ANANIA GEOLOGIC ENGINEERING

BORING LOG

LOCATION OF BORING



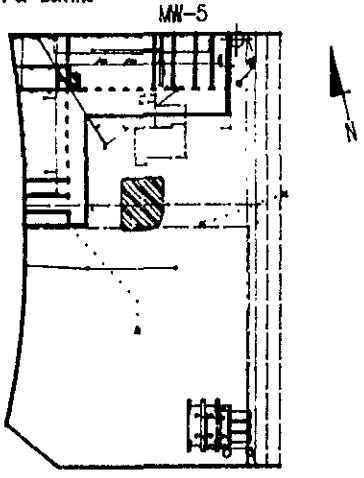
SITE/LOCATION	CARNATION/OAKLAND				BORING NO. MW-4
PROJECT NO.	004-88-059				SHEET 3 OF 3
WATER LEVEL					DRILLER
TIME					START TIME: 7:30 / FINISH TIME: 4:20
DATE					START DATE: 3-20-89 / FINISH DATE: 3-20-89
CASING DEPTH ESTIMATED					
DRILLING CONTRACTOR	PC EXPLORATION				
DRILLER	MIKE MOORE				
DRILLING METHOD	HOLLOW STEM AUGER				
SAMPLING METHOD	MPS				
LOGGER	ERIC HOLM				
N/S	N 2484.9	E/W	E 3023.1	ELEV.	14.84
BORING DIAMETER:	10 INCHES	WELL CASING DIAMETER:	4 INCHES		
REVIEWED BY:		DATE			

DIST. FROM SURF.	WELL CONST. CASING	WELL CONST. SCREEN	LEGEND	TLV READING	SAMPLE NO.	RECOVERY	BLOWS PER 6 IN.	USCS	LOG OF MATERIAL
				0		X	6		
						X	7		
41	0.030 INCH SLOT	#3 SAND					5	SM	
							7		
42				0		X	7		
						X	6		
43							8		
						X	6		MEDIUM SAND- SOME SILT, REDDISH BROWN, AREAS OF OXIDATION, QUARTZ,
44							7	SM	MAFICS, WET, NON-PLASTIC, MEDIUM DENSE, NO ODOR.
						X	8		
45							6		
								TD	
46									SAMPLE COULD NOT BE RETAINED AFTER 4 ATTEMPTS WITH SAND
									CATCHER.
47									
48									2 BAGS OF CEMENT
									1-5 GAL. BUCKET OF BENTONITE PELLETS.
49									14 1/2 BAGS OF #3 SAND.
50									

ANANIA GEOLOGIC ENGINEERING

BORING LOG

LOCATION OF BORING



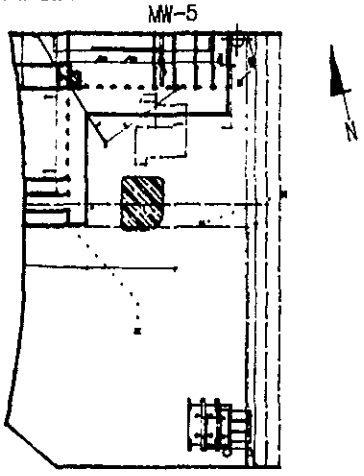
SITE/LOCATION	CARNATION/OAKLAND				BORING NO. MW-5
PROJECT NO.	004-88-059				SHEET 1 OF 2
WATER LEVEL					DRILLER
TIME					START TIME 7:45 / FINISH TIME 11:30
DATE					START DATE 3-21-89 / FINISH DATE 3-21-89
CASING DEPTH					
DRILLING CONTRACTOR	ENSCO SERVICES				
DRILLER	FRANK BARTOLVICH				
DRILLING METHOD	HOLLOW STEM AUGER				
SAMPLING METHOD	MPS				
LOGGER	KARL ANANIA				
N/S	N 2616.5	E/W	E 3310.7	ELEV.	14.82
BORING DIAMETER:	10 INCHES	WELL CASING DIAMETER:	4 INCHES		
REVIEWED BY:		DATE			

DIST. FROM SURF.	WELL CONST. CASING	WELL CONST. ANNULUS	LEGEND	TLV READING	SAMPLE NO.	RECOVERY	BLOWS PER 6 IN.	USCS	LOG OF MATERIAL
									ASPHALT
1		4% BENTONITE CEMENT SLURRY						SC	SILTY SAND- GRAY GREEN, FINE SAND WITH ABUNDANT SILY, LOOSE, HUMID, ANGULAR TO SUB-ANGULAR SAND GRAINS.
2									
3									
4	2" PVC BLANK	3/8" BENT. PELLET							
5									
6				0	3985		20		
7							50	ML	SANDY SILT- LIGHT YELLOWISH BROWN, MOIST TO WET, MINOR CLAY, SLIGHTLY PLASTIC.
8									
9							22		
10				0			30		
11					3986		42		
12									
13	0.030 INCH SLOT	3/4 SAND							
14									
15									
16									
17							12	SC	SILTY SAND- LIGHT BROWN AND OLIVE MOTTLED, SILT AND VERY MINOR CLAY, MOIST.
18				0			5		
19							4		
20									

ANANIA GEOLOGIC ENGINEERING

BORING LOG

LOCATION OF BORING



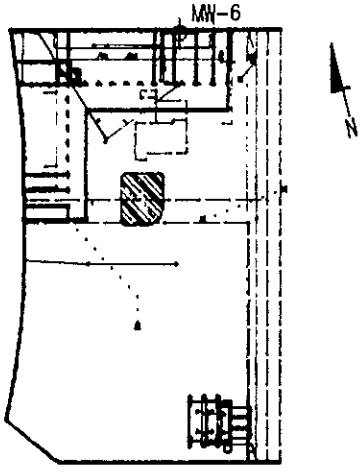
SITE/LOCATION	CARNATION/OAKLAND				BORING NO. MW-5
PROJECT NO.	004-88-059				
WATER LEVEL					SHEET 2 OF 2
TIME					DRILLER
DATE					START / FINISH
CASING DEPTH					TIME 7:45 / TIME 11:30
DRILLING CONTRACTOR	ENSCO SERVICES				DATE 3-21-89 / DATE 3-21-89
DRILLER	FRANK BARTOLVICH				
DRILLING METHOD	HOLLOW STEM AUGER				
SAMPLING METHOD	MPS				
LOGGER	KARL ANANIA				
N/S	N 2616.5	E/W	E 3310.7	ELEV.	14.82
BORING DIAMETER:	10 INCHES			WELL CASING DIAMETER:	4 INCHES
REVIEWED BY:				DATE	

DIST. FROM SURF.	WELL CONST. CASING	WELL CONST. ANNULUS	LEGEND	TLV READING	SAMPLE NO.	RECOVERY	BLOWS PER 6 IN.	USCS	LOG OF MATERIAL
21									
22	0.030 INCH SLOT	#3 SAND							SANDY SILT "STIFF" BROWN TO TAN SILT AND CLAY WITH FINE
23									SAND, FIRM & WET.
24								SC	
25								TD	
									4 BAGS OF #3 SAND
									1 BAG OF CEMENT
									2/3-5 GALLON BUCKET OF BENTONITE

ANANIA GEOLOGIC ENGINEERING

BORING LOG

LOCATION OF BORING



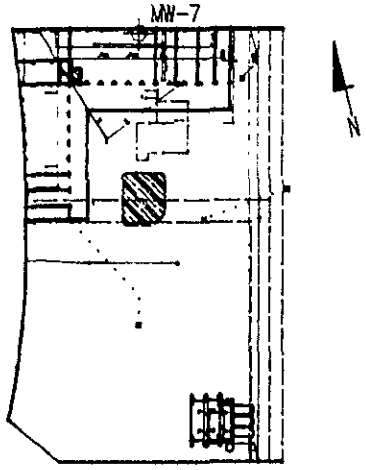
SITE/LOCATION	CARNATION/OAKLAND				BORING NO. MW-6
PROJECT NO.	004-88-059				
WATER LEVEL					SHEET 1 OF 1
TIME					DRILLER
DATE					START / FINISH
CASING DEPTH					TIME 14:00 / 14:30
DRILLING CONTRACTOR	ENSCO SERVICES				DATE 3-17-89 / 3-17-89
DRILLER	J R				
DRILLING METHOD	HOLLOW STEM AUGER				
SAMPLING METHOD	MPS				
LOGGER	NICK COFFEE				
N/S	N 2634.0	E/W	E 3259.1	ELEV.	14.79
BORING DIAMETER:	6 INCHES	WELL CASING DIAMETER:	2 INCHES		
REVIEWED BY:		DATE			

DIST. FROM SURF.	WELL CONST. CASING	WELL CONST. ANNULUS	LEGEND	TLV READING	SAMPLE NO.	RECOVERY	BLOWS PER 6 IN.	USCS	LOG OF MATERIAL
									CONCRETE
1		4% BENTONITE CEMENT SLURRY						SP	SAND- OLIVE, VERY FINE TO FINE, ANGULAR TO SUB-ANGULAR GRAINS,
2									LOOSE, HUMID, OILY ODOR.
3	BLANK								
4		3/8" BENT. PELLET					6	SM	SILTY SAND- OLIVE, FINE, SUB-ANGULAR TO SUB-ROUNDED SAND,
5					3164		11		15-20% SILT, MEDIUM DENSE, HUMID.
							19	SC	3'10"- 4'2" : BLACK, OILY ODOR.
6									5'0" - APPROX. 8'0" : BLACK OILY ODOR WITH 10% CLAY.
7									
8								SP	SAND- OLIVE, VERY FINE TO FINE, SUB-ANGULAR TO SUB-ROUNDED, UP
9									TO 3% SILT + CLAY.
							8		
10					3165		11		SILTY SAND- LIGHT YELLOWISH BROWN AND OLIVE, MOTTLED, FINE,
							18		SUB-ROUNDED TO ROUNDED SAND, 15-20% SILT, LOOSE,
11	0.030 INCH SLOT	#3 SAND							WET. LITTLE TO NO ODOR.
12									
13									
14									
15									
16					3166		3		SILTY SAND- LIGHT YELLOWISH BROWN AND OLIVE, MOTTLED, FINE
							5		SUB-ROUNDED TO ROUNDED SAND, 15-20% SILT, LOOSE, WET,
17							9		LITTLE TO NO ODOR, OXIDIZED ZONES 1/4" X 1/64-1/32".
								TD	
									4 BAGS OF #3 SAND
									1 BAG OF CEMENT
									2/3-5 GALLON BUCKET OF BENTONITE

ANANIA GEOLOGIC ENGINEERING

BORING LOG

LOCATION OF BORING



SITE/LOCATION	CARNATION/OAKLAND				BORING NO. MW-7
PROJECT NO.	004-88-059				SHEET 1 OF 2
WATER LEVEL					DRILLER
TIME					START TIME 13:00 / FINISH TIME 13:50
DATE					START DATE 3-16-89 / FINISH DATE 3-16-89
CASING DEPTH					

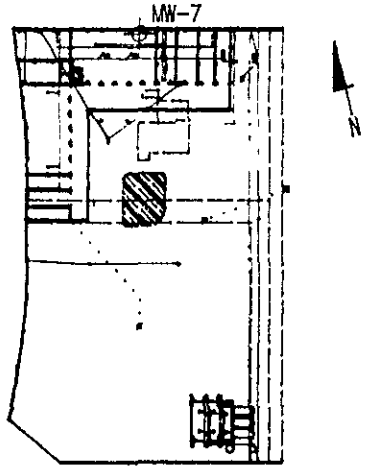
DRILLING CONTRACTOR: ENSCO SERVICES
DRILLER: J R
DRILLING METHOD: HOLLOW STEM AUGER
SAMPLING METHOD: MPS
LOGGER: NICK COFFEE
N/S: N 2650.0 | E/W: E 3199.2 | ELEV.: 14.74
BORING DIAMETER: 6 INCHES | WELL CASING DIAMETER: 2 INCHES
REVIEWED BY: | DATE

DIST. FROM SURF.	WELL CONST. CASING	WELL CONST. ANNULUS	LEGEND	TLV READING	SAMPLE NO.	RECOVERY	BLOWS PER 6 IN.	USCS	LOG OF MATERIAL
									CONCRETE
1	6"	4" BENTONITE CEMENT SLURRY						SM	SILTY SAND- GRAY, FINE SAND, DAMP, GASOLINE ODOR.
2									
3	BLANK								
4		3/8" BENT. PELLET					4		
5					3163	6	7		
						6	10		
6						6			
7									
8									
9									
						6	12		SILTY SAND- YELLOWISH BROWN, 15-20% SILT + CLAY, MOIST, SLIGHT
10					3164	6	21		GASOLINE ODOR.
						6	30		
11									
12	0.030 INCH SLOT	#3 SAND							
13									CLAYEY SAND- LIGHT YELLOWISH BROWN, FINE SAND WITH 20-40%
14									SILT + CLAY.
						N/R	4		
15						N/R	5		
						N/R	9	SC	
16					3165	6	4		
						6	5		
17						4	9		
18								SP	
19									SAND- YELLOWISH BROWN, FINE SAND WITH 5-10% SILT, MEDIUM DENSE,
20								SC	WET.

ANANIA GEOLOGIC ENGINEERING

BORING LOG

LOCATION OF BORING



SITE/LOCATION	CARNATION/OAKLAND				BORING NO. MW-7
PROJECT NO.	004-88-059				SHEET 2 OF 2
WATER LEVEL					DRILLER
TIME					START TIME 13:00 / FINISH TIME 13:50
DATE					START DATE 3-16-89 / FINISH DATE 3-16-89
CASING DEPTH					

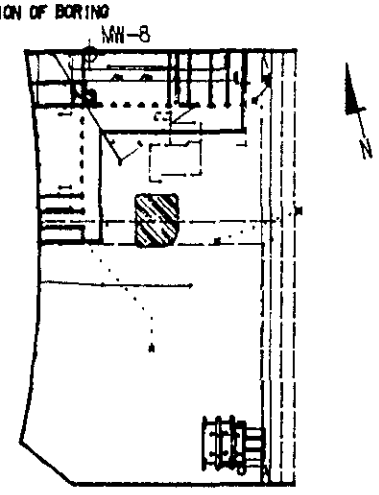
DRILLING CONTRACTOR: ENSCO SERVICES
DRILLER: J R
DRILLING METHOD: HOLLOW STEM AUGER
SAMPLING METHOD: MPS
LOGGER: NICK COFFEE
N/S: N 2650.0 E/W: E 3199.2 ELEV.: 14.74
BORING DIAMETER: 6 INCHES WELL CASING DIAMETER: 2 INCHES
REVIEWED BY: DATE

DIST. FROM SURF.	WELL CONST. CASING	WELL CONST. ANNULUS	LEGEND	TLV READING	SAMPLE NO.	RECOVERY	BLOWS PER 6 IN.	USCS	LOG OF MATERIAL
									CLAYEY SAND
21					3156				SAND- LIGHT YELLOWISH BROWN, FINE SAND, 3-7% SILT, MEDIUM DENSE, WET.
22								TD	HOLE TERMINATED AT 22 FEET. BACK FILLED TO 17 FEET WITH BENTONITE PELLETS AND SAND. COMPLETED AS MONITORING WELL.
									4 BAGS OF #3 SAND
									1 BAG OF CEMENT
									2/3-5 GALLON BUCKET OF BENTONITE

ANANIA GEOLOGIC ENGINEERING

BORING LOG

LOCATION OF BORING



SITE/LOCATION	CARNATION/OAKLAND				BORING NO. MW-8
PROJECT NO.	004-88-059				
WATER LEVEL	9-10				SHEET 1 OF 1
TIME	14:30				DRILLER
DATE	3/17				START TIME 13:40 / FINISH TIME 14:10
CASING DEPTH	UNCASED				START DATE 3-17-89 / FINISH DATE 3-17-89

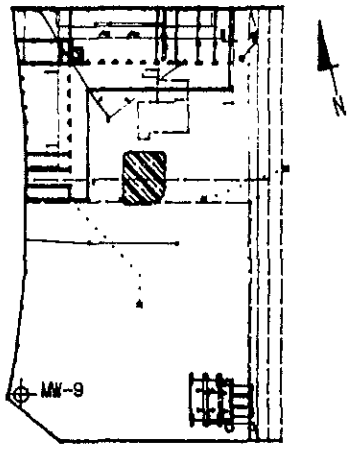
DRILLING CONTRACTOR: ENSCO SERVICES
DRILLER: J R
DRILLING METHOD: HOLLOW STEM AUGER
SAMPLING METHOD: MPS
LOGGER: NICK COFFEE
N/S: N 2672.3 E/W: E 3129.8 ELEV.: 14.77
BORING DIAMETER: 6 INCHES WELL CASING DIAMETER: 2 INCHES
REVIEWED BY: DATE

DIST. FROM SURF.	WELL CONST. CASING	WELL CONST. ANNULUS	LEGEND	TLV READING	SAMPLE NO.	RECOVERY	BLOWS PER 6 IN.	USCS	LOG OF MATERIAL
									CONCRETE
1		4% BENTONITE CEMENT SLURRY						ML	SANDY SILT DARK REDDISH BROWN, 30-40% FINE, ANGULAR TO SUB-ANGULAR SAND, VERY LOOSE, HUMID.
2									
3	BLANK							SC	CLAYEY SAND- LIGHT OLIVE, OCCASIONAL SUB-ROUNDED PEBBLES TO 1 1/2" DIAMETER.
4							4		SAND- OLIVE, VERY FINE, LOOSE, MOIST.
5		3/8" BENT. PELLET			3161		5	SP	
6							7		
7								SC	CLAYEY SAND- LIGHT YELLOWISH BROWN, MEDIUM, SUB-ANGULAR TO SUB-ROUNDED SAND.
8									
9							12		SILTY SAND- LIGHT YELLOWISH BROWN, MEDIUM, SUB-ROUNDED SAND,
10		#3 SAND		10,000	3162		16		10-20% SILT + CLAY, MEDIUM DENSE, MOIST, GASOLINE ODOR.
11	0.030 INCH SLOT						23	SM-SC	
12									
13									
14									
15									
16					3163		4		CLAYEY SAND- LIGHT YELLOWISH BROWN AND OLIVE MOTTLED, VERY FINE TO FINE SAND WITH 30-40% SILT + CLAY, LOOSE, WET, FAINT HYDROCARBON ODOR.
17							5		
							6		
								TD	

ANANIA GEOLOGIC ENGINEERING

BORING LOG

LOCATION OF BORING



SITE/LOCATION	CARNATION/OAKLAND				BORING NO. MW-9
PROJECT NO.	004-68-059				SHEET 1 OF 2
WATER LEVEL					DRILLER
TIME					START TIME 7:30 / FINISH TIME 12:00
DATE					DATE 3-17-89 / DATE 3-17-89
CASING DEPTH					

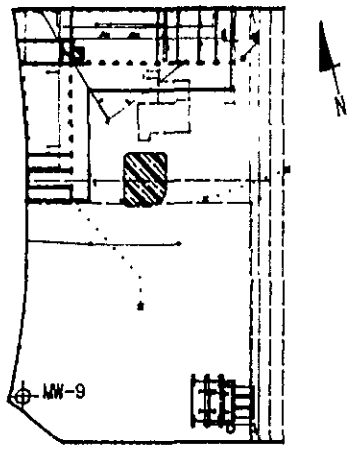
DRILLING CONTRACTOR: PC EXPLORATION
DRILLER: MIKE MOORE
DRILLING METHOD: HOLLOW STEM AUGER
SAMPLING METHOD: MPS
LOGGER: ERIC HOLM
N/S: N 2289.9 E/W: E 2956.1 ELEV.: 15.77
BORING DIAMETER: 10 INCHES WELL CASING DIAMETER: 4 INCHES
REVIEWED BY: DATE

DIST. FROM SURF.	WELL CONST. CASING	WELL CONST. ANNULUS	LEGEND	TLV READING	SAMPLE NO.	RECOVERY	BLOWS PER 6 IN.	USCS	LOG OF MATERIAL
									ASPHALT
1		4sx BENTONITE CEMENT SLURRY						SM	
2									
3	BLANK						7		
4					3661		9		SILTY SAND- REDDISH BROWN, AREAS OF OXIDATION, QUARTZ, MAFICS,
5		3/8" BENT. PELL.		0					MOIST, PLASTIC, MEDIUM DENSE, NO ODOR.
6									
7									
8					3662		9		
9		#3 SAND		0			10		MEDIUM SAND- REDDISH BROWN, SOME SILT, AREAS OF OXIDATION, QUARTZ, MAFICS, MOIST, NON PLASTIC, MEDIUM DENSE, NO ODOR.
10									
11									
12									
13	0.020 INCH SLOT							SP	
14							10		
15				0			12		
16							13		MEDIUM SAND- REDDISH BROWN, SOME SILT, AREAS OF OXIDATION, QUARTZ, MAFICS, MOIST, NON PLASTIC, MEDIUM DENSE, NO ODOR.
17									
18									
19							9		
20				0			11		MEDIUM SAND- REDDISH BROWN, SOME SILT, AREAS OF OXIDATION, QUARTZ, MAFICS, MOIST, NON PLASTIC, MEDIUM DENSE, NO ODOR.
							11		

ANANIA GEOLOGIC ENGINEERING

BORING LOG

LOCATION OF BORING



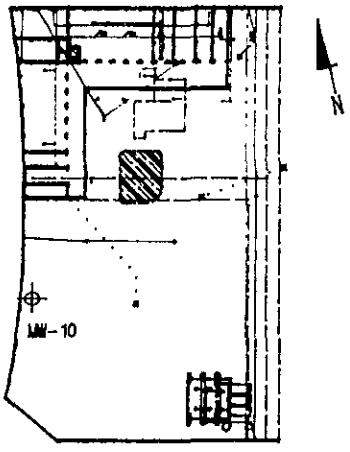
SITE/LOCATION	CARNATION/OAKLAND				BORING NO. MW-9
PROJECT NO.	004-88-059				SHEET 2 OF 2
WATER LEVEL					DRILLER
TIME					START TIME 7:30 / FINISH TIME 12:00
DATE					START DATE 3-17-89 / FINISH DATE 3-17-89
CASING DEPTH					
DRILLING CONTRACTOR	PC EXPLORATION				
DRILLER	MIKE MOORE				
DRILLING METHOD	HOLLOW STEM AUGER				
SAMPLING METHOD	SPS				
LOGGER	ERIC HOLM				
N/S	N 2259.9	E/W	E 2956.1	ELEV.	15.77
BORING DIAMETER:	10 INCHES			WELL CASING DIAMETER:	4 INCHES
REVIEWED BY:				DATE	

DIST. FROM SURF.	WELL CONST. CASING	WELL CONST. ANNULUS	LEGEND	TLV READING	SAMPLE NO.	RECOVERY	BLOWS PER 6 IN.	USCS	LOG OF MATERIAL
21									
22								SP	
23	BLANK	#3 SAND							
24						X	7		
						X	9		
25				0		X	9		MEDIUM SAND- REDDISH BROWN, SOME SILT, AREAS OF OXIDATION, QUARTZ, MAFICS, MOIST, NON PLASTIC, MEDIUM DENSE, NO ODOR.
								TD	
									7 BAGS OF #3 SAND
									1 1/2 BAGS OF CEMENT
									1-5 GALLON BUCKET OF BENTONITE

ANANIA GEOLOGIC ENGINEERING

BORING LOG

LOCATION OF BORING



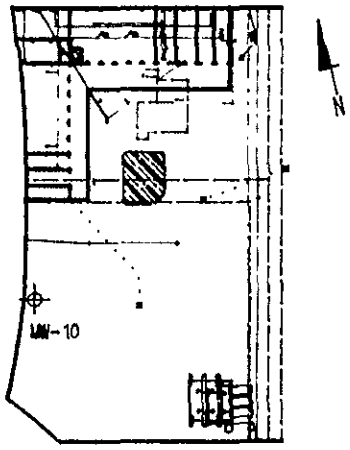
SITE/LOCATION	CARNATION/OAKLAND				BORING NO. MW-10
PROJECT NO.	004-88-059				SHEET 1 OF 2
WATER LEVEL					DRILLER
TIME					START: TIME 1215 / DATE 3-16-89
DATE					FINISH: TIME 510 / DATE 3-16-89
CASING DEPTH					
DRILLING CONTRACTOR	PC EXPLORATION				
DRILLER	MIKE MOORE				
DRILLING METHOD	HOLLOW STEM AUGER				
SAMPLING METHOD	MPS				
LOGGER	ERIC HOLM				
N/S	N 2373.5	E/W	E 2933.6	ELEV.	19.04
BORING DIAMETER:	10 INCHES			WELL CASING DIAMETER:	4 INCHES
REVIEWED BY:				DATE	

DIST. FROM SURF.	WELL CONST. CASING	WELL CONST. ANNULUS	LEGEND	TLV READING	SAMPLE NO.	RECOVERY	BLOWS PER 6 IN.	USCS	LOG OF MATERIAL
									ASPHALT
1								GP	GRAVELY SAND- GRAYISH BROWN, GRAVEL ANGULAR 1/2" TO 1 1/2" QUARTZ, MAFICS, SLIGHTLY MOIST, SOME ORGANICS, NON- PLASTIC, MEDIUM DENSE, NO ODOR.
2		4# BENTONITE CEMENT SLURRY							
3									
4	BLANK					X	8		BRICK PIECES
						X	7		
5		3/8" BENT. PELL.		0	3687	X	7	SM	SILTY SAND- TANNISH BROWN, SOME GRAVEL, QUARTZ, MAFICS, SLIGHTLY MOIST, NON-PLASTIC, MEDIUM DENSE, NO ODOR.
6									
7									
8								SP	
9						X	5		
						X	6		MEDIUM SAND- SOME SILT, BROWN, TRACE OF QUARTZ, MAFICS, LAMINATIONS -HORIZONTAL, MOIST, SLIGHTLY PLASTIC, MEDIUM DENSE, NO ODOR.
10				0	3688	X	6		
11		#3 SAND							
12									
13	0.020 INCH SLOT								
14						X	8		SILTY SAND- GRAY AND BROWN, AREAS OF OXIDATION, QUARTZ, MAFICS, WET, SLIGHTLY PLASTIC, MEDIUM DENSE, NO ODOR.
						X	8		
15				0		X	8		
16									
17								SM	
18									
19						X	5		
						X	5		SILTY SAND- GRAY AND BROWN, AREAS OF OXIDATION, QUARTZ, MAFICS, WET, SLIGHTLY PLASTIC, MEDIUM DENSE, NO ODOR.
20				0		X	7		

ANANIA GEOLOGIC ENGINEERING

BORING LOG

LOCATION OF BORING



SITE/LOCATION	CARNATION/OAKLAND				BORING NO. MW-10
PROJECT NO.	004-88-059				SHEET 2 OF 2
WATER LEVEL					DRILLER
TIME					START: TIME 1215 / FINISH: TIME 540
DATE					START: DATE 3-16-89 / FINISH: DATE 3-16-89
CASING DEPTH					

DRILLING CONTRACTOR: PC EXPLORATION

DRILLER: MIKE MOORE

DRILLING METHOD: HOLLOW STEM AUGER

SAMPLING METHOD: MPS

LOGGER: ERIC HOLM

N/S: N 2373.5 E/W: E 2963.6 ELEV.: 18.04

BORING DIAMETER: 10 INCHES WELL CASING DIAMETER: 4 INCHES

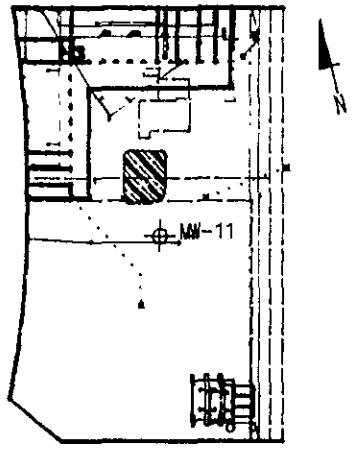
REVIEWED BY: DATE

DIST. FROM SURF.	WELL CONST. CASING	WELL CONST. ANNULUS	LEGEND	TLV READING	SAMPLE NO.	RECOVERY	BLOWS PER 6 IN.	USCS	LOG OF MATERIAL
21								SM	
22	0.030 INCH SLOT	#3 SAND							
23									
24						X	7		
25				0		X	8		SILTY SAND- GRAY AND BROWN, AREAS OF OXIDATION, QUARTZ, MAFICS, WET, SLIGHTLY PLASTIC, MEDIUM DENSE, NO ODOR.
								TD	
									7 1/2 BAGS OF #3 SAND
									1 1/4 BAGS OF CEMENT
									1-5 GALLON BUCKET OF BENTONITE

ANANIA GEOLOGIC ENGINEERING

BORING LOG

LOCATION OF BORING



SITE/LOCATION	CARNATION/OAKLAND				BORING NO. MW-11
PROJECT NO.	004-68-059				SHEET 1 OF 2
WATER LEVEL					DRILLER
TIME					START TIME 7:15 / FINISH TIME 10:10
DATE					DATE 3-21-89 / DATE 3-21-89
CASING DEPTH					

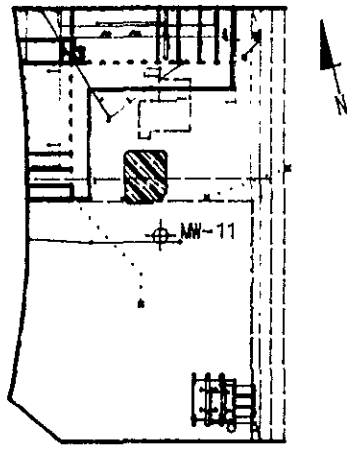
DRILLING CONTRACTOR: PC EXPLORATION
DRILLER: MIKE MOORE
DRILLING METHOD: HOLLOW STEM AUGER
SAMPLING METHOD: MPS
LOGGER: ERIC HOLM
N/S: N 2431.9 E/W: E 3127.6 ELEV.: 15.06
BORING DIAMETER: 10 INCHES CASING DIAMETER: 4 INCHES
REVIEWED BY: DATE

DIST. FROM SURF.	WELL CONST. CASING	WELL CONST. ANNULUS	LEGEND	TLV READING	SAMPLE NO.	RECOVERY	BLOWS PER 6 IN.	USCS	LOG OF MATERIAL
									ASPHALT
1								GM	GRAVEL
2		4¢ BENTONITE CEMENT SLURRY							
3									
4	BLANK						6		
		3/8" BENT. PELL.					7		SILTY SAND- REDDISH BROWN, QUARTZ, MAFICS, MOIST, SLIGHTLY PLASTIC,
5							7		MEDIUM DENSE, NO ODOR.
				3	3671		7		
6							8		
				8			9		
7							8		
					3673		9		
8					3674		11		
					3675		8		
9							7		SILTY SAND- REDDISH BROWN, AREAS OF OXIDATION, MAFICS, QUARTZ,
				8	3672		8	SM	SLIGHTLY MOIST, SLIGHTLY PLASTIC, MEDIUM DENSE, NO ODOR.
10							9		
11		#3 SAND							
12									
13									
	0.020 INCH SLOT								
14							6		
							7		
15				11	3676	3	7		SILTY SAND- REDDISH BROWN, AREAS OF OXIDATION, MAFICS, QUARTZ,
					3677		8		WET, SLIGHTLY PLASTIC, MEDIUM DENSE, NO ODOR.
16					3678		7		
							7		
17									
18									
19							7		
							7		SILTY SAND- REDDISH BROWN, AREAS OF OXIDATION, MAFICS, QUARTZ,
20				4			6		WET, SLIGHTLY PLASTIC, MEDIUM DENSE, NO ODOR.

ANANIA GEOLOGIC ENGINEERING

BORING LOG

LOCATION OF BORING



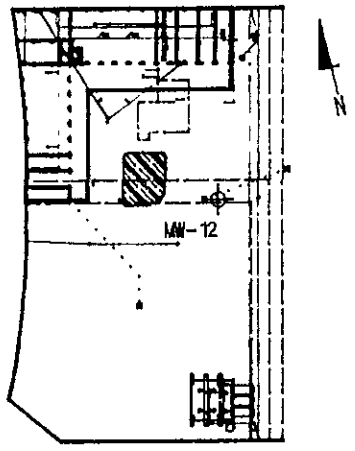
SITE/LOCATION	CARNATION/OAKLAND				BORING NO. MW-11
PROJECT NO.	004-88-059				SHEET 2 OF 2
WATER LEVEL					DRILLER
TIME					START TIME 7:15 / FINISH TIME 10:10
DATE					START DATE 3-21-89 / FINISH DATE 3-21-89
CASING DEPTH					
DRILLING CONTRACTOR	PC EXPLORATION				
DRILLER	MIKE MOORE				
DRILLING METHOD	HOLLOW STEM AUGER				
SAMPLING METHOD	MPS				
LOGGER	ERIC HOLM				
N/S	N 2431.9	E/W	E 3127.6	ELEV.	15.06
BORING DIAMETER:	10 INCHES	WELL CASING DIAMETER:	4 INCHES		
REVIEWED BY:		DATE			

DIST. FROM SURF.	WELL CONST. CASING	WELL CONST. ANNULUS	LEGEND	TLV READING	SAMPLE NO.	RECOVERY	BLOWS PER 6 IN.	USCS	LOG OF MATERIAL
21	0.030 INCH SLOT	#3 SAND						SM	
22									
23									
24							7		
							7		
25				0			7		SILTY SAND- REDDISH BROWN, AREAS OF OXIDATION, QUARTZ, MAFICS, WET, SLIGHTLY PLASTIC, MEDIUM DENSE, NO ODOR.
								TD	
									7 BAGS OF #3 SAND
									1 1/2 BAGS OF CEMENT
									1-5 GALLON BUCKET OF BENTONITE

ANANIA GEOLOGIC ENGINEERING

BORING LOG

LOCATION OF BORING



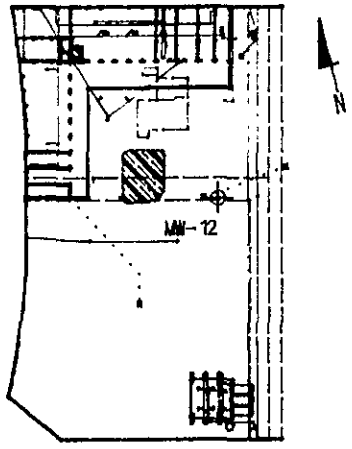
SITE/LOCATION	CARNATION/OAKLAND				BORING NO. MW-12
PROJECT NO.	004-88-059				
WATER LEVEL					SHEET 1 OF 2
TIME					DRILLER
DATE					START / FINISH
CASING DEPTH					TIME 10:10 / TIME 1:00
DRILLING CONTRACTOR	PC EXPLORATION				DATE 3-21-89 / DATE 3-21-89
DRILLER	MIKE MOORE				
DRILLING METHOD	HOLLOW STEM AUGER				
SAMPLING METHOD	MPS				
LOGGER	ERIC HOLM				
N/S	N 2450.8	E/W	E 3230.5	ELEV.	15.70
BORING DIAMETER:	10 INCHES	WELL CASING DIAMETER:	4 INCHES		
REVIEWED BY:		DATE			

DIST. FROM SURF.	WELL CONST. CASING	WELL CONST. ANNULUS	LEGEND	TLV READING	SAMPLE NO.	RECOVERY	BLOWS PER 6 IN.	USCS	LOG OF MATERIAL
									ASPHALT
1		4" BENTONITE CEMENT SLURRY						GM	GRAVEL
2									
3									
4	BLANK					X	5		
		3/8" BENT. PELL.				X	5		
5				11	3679	X	5		SILTY SAND- REDDISH BROWN, AREAS OF OXIDATION, QUARTZ, MAFICS, MOIST, SLIGHTLY PLASTIC, LOOSE, NO ODOR.
6						X	6		
						X	7		
7						X	9		SILTY SAND- REDDISH BROWN, AREAS OF OXIDATION, QUARTZ, MAFICS, MOIST, SLIGHTLY PLASTIC, LOOSE, MEDIUM DENSE, NO ODOR.
8						X	8		
						X	8		
9				9	3680	X	9	SM	SILTY SAND- REDDISH BROWN, AREAS OF OXIDATION, QUARTZ, MAFICS, MOIST, SLIGHTLY PLASTIC, LOOSE, MEDIUM DENSE, NO ODOR.
10		#3 SAND							
11									
12									
13	0.030 INCH SLOT								
14							7		
						X	8		
15				16		X	8		SILTY SAND- REDDISH BROWN, QUARTZ, MAFICS, WET, SLIGHTLY PLASTIC, MEDIUM DENSE, NO ODOR.
16									
17									
18									
19							8	SP	
							9		NO SAMPLE RECOVERED.
20							9		

ANANIA GEOLOGIC ENGINEERING

BORING LOG

LOCATION OF BORING

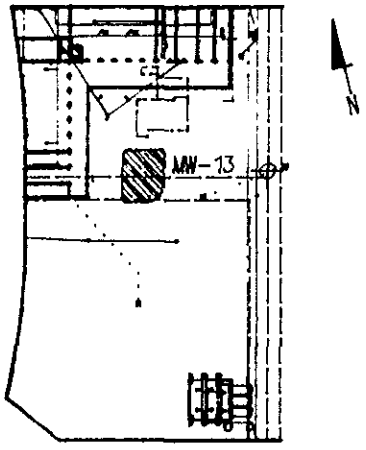


SITE/LOCATION	CARNATION/OAKLAND				BORING NO. MW-12
PROJECT NO.	004-88-059				SHEET 2 OF 2
WATER LEVEL					DRILLER
TIME					START TIME 10:10 / FINISH TIME 1:00
DATE					DATE 3-21-89 / DATE 3-21-89
CASING DEPTH					
DRILLING CONTRACTOR	PC EXPLORATION				
DRILLER	MIKE MOORE				
DRILLING METHOD	HOLLOW STEM AUGER				
SAMPLING METHOD	MPS				
LOGGER	ERIC HOLM				
N/S	N 2450.8	E/W	E 3230.5	ELEV.	15.70
BORING DIAMETER:	10 INCHES			WELL CASING DIAMETER:	4 INCHES
REVIEWED BY:				DATE	

DIST. FROM SURF.	WELL CONST. CASING	WELL CONST. ANNULUS	LEGEND	TLV READING	SAMPLE NO.	RECOVERY	BLOWS PER 6 IN.	USCS	LOG OF MATERIAL
21								SM	
22	0.030 INCH SLOT	#3 SAND							
23								SP	
24						X	6		
25						X	9		
				7		X	9		MEDIUM SAND- SOME SILT, GRAYISH BROWN, QUARTZ, MAFICS, WET, NON-PLASTIC, MEDIUM DENSE, NO ODOR.
								TD	
									7 1/2 BAGS OF #3 SAND
									1 1/2 BAGS OF CEMENT
									1-5 GALLON BUCKET OF BENTONITE

ANANIA GEOLOGIC ENGINEERING — BORING LOG

LOCATION OF BORING



SITE/LOCATION	CARNATION/OAKLAND				BORING NO. MW-13
PROJECT NO.	004-88-050				SHEET 1 OF 2
WATER LEVEL					DRILLER
TIME					START: TIME 11:45 / DATE 3-21-89 — FINISH: TIME 15:50 / DATE 3-21-89
DATE					
CASING DEPTH					

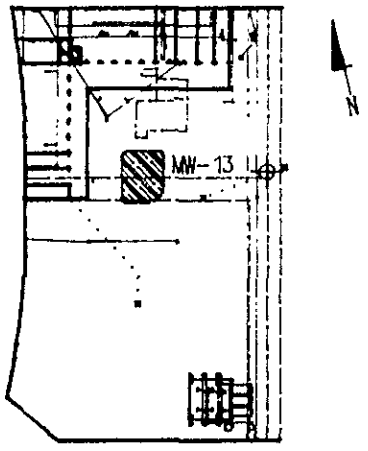
DRILLING CONTRACTOR: ENSCO SERVICES
DRILLER: FRANK BARTOLVICH
DRILLING METHOD: HOLLOW STEM AUGER
SAMPLING METHOD: MPS
LOGGER: KARL ANANIA
N/S: N 2489.7 | E/W: E 3290.0 | ELEV.: 15.48
BORING DIAMETER: 10 INCHES | WELL CASING DIAMETER: 4 INCHES
REVIEWED BY: DATE

DIST. FROM SURF.	WELL CONST. CASING	WELL CONST. ANNULUS	LEGEND	TLV READING	SAMPLE NO.	RECOVERY	BLOWS PER 6 IN.	USCS	LOG OF MATERIAL
									ASPHALT
									SUBBASE
1									ASPHALT
									SUBBASE
2		4¢ BENTONITE CEMENT SLURRY							ASPHALT
									GRAVEL & BROKEN ROCK
3								GM	
4	2" PVC BLANK								SILTY SAND- YELLOWISH BROWN, FINE SAND WITH SILT AND MINOR CLAY,
		3/8" BENT. PELLET							HUMID TO WET, DARKER BROWN MOTTLING, SLIGHTLY PLASTIC.
5							6		
				0	3669		7		
6							8		
7									
8							24		
				0	3970		28		
9							40		
10								SM	
11									
12									
13	0.030 INCH SLOT	¾ SAND							
14									
15							6		
				0			7		
16							13		
17									
									SANDY SILT- BROWN TO TAN, FINE SAND IN SILTMATRIX STIFF, WET.
18									
								ML	
19									

ANANIA GEOLOGIC ENGINEERING

BORING LOG

LOCATION OF BORING



SITE/LOCATION	CARNATION/OAKLAND				BORING NO. MW-13
PROJECT NO.	004-88-059				SHEET 2 OF 2
WATER LEVEL					DRILLER
TIME					START TIME 11:45 / FINISH TIME 15:50
DATE					START DATE 3-21-89 / FINISH DATE 3-21-89
CASING DEPTH					

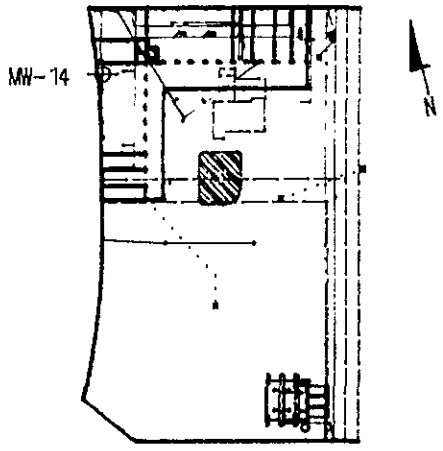
DRILLING CONTRACTOR: ENSCO SERVICES
DRILLER: FRANK BARTOLVICH
DRILLING METHOD: HOLLOW STEM AUGER
SAMPLING METHOD: MPS
LOGGER: KARL ANANIA
N/S: N 2489.7 E/W: E 3290.0 ELEV.: 15.48
BORING DIAMETER: 10 INCHES WELL CASING DIAMETER: 4 INCHES
REVIEWED BY: DATE

DIST. FROM SURF.	WELL CONST. CASING	WELL CONST. ANNULUS	LEGEND	TLV READING	SAMPLE NO.	RECOVERY	BLOWS PER 6 IN.	USCS	LOG OF MATERIAL
							32		
							50		
21									
22		#3 SAND						ML	
23									
24									
25								TD	4 BAGS OF #3 SAND
									1 BAG OF CEMENT
									2/3-5 GALLON BUCKET OF BENTONITE

ANANIA GEOLOGIC ENGINEERING

BORING LOG

LOCATION OF BORING



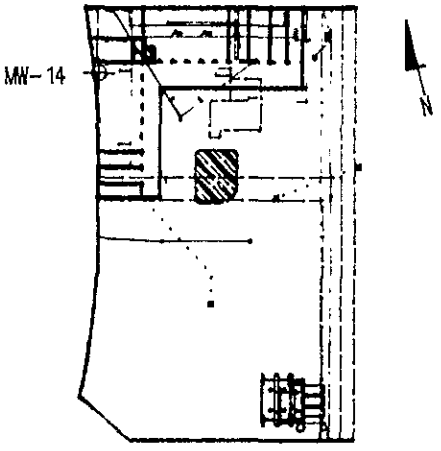
SITE/LOCATION	CARNATION/OAKLAND				BORING NO. MW-14
PROJECT NO.	004-88-059				SHEET 1 OF 2
WATER LEVEL					DRILLER
TIME					START TIME: 07:50
DATE					FINISH TIME: 08:30
CASING DEPTH					START DATE: 3-17-89
DRILLING CONTRACTOR	ENSCO SERVICES				FINISH DATE: 3-17-89
DRILLER	J R				
DRILLING METHOD	HOLLOW STEM AUGER				
SAMPLING METHOD	MPS				
LOGGER	NICK COFFEE				
N/S	N 2819.1	E/W	E 3055.0	ELEV.	14.80
BORING DIAMETER:	6 INCHES	WELL CASING DIAMETER:	2 INCHES		
REVIEWED BY:		DATE			

DIST. FROM SURF.	WELL CONST. CASING	WELL CONST. ANNULUS	LEGEND	TLV READING	SAMPLE NO.	RECOVERY	BLOWS PER 6 IN.	USCS	LOG OF MATERIAL
									CONCRETE
1		4% BENTONITE CEMENT SLURRY							CLAYEY SAND- GREY, FINE TO MEDIUM SAND, HUMID.
2									
3									
4	BLANK					0	4	SC	CLAYEY SAND- YELLOWISH BROWN, MEDIUM TO COARSE SAND WITH 10-15%
5		3/8" BENT. PELLET			3149	6	5		CLAY, DAMP.
						6	6		
6									
7									
8									
9						4	16		SAND- REDDISH BROWN WITH MEDIUM GREY MOTTLING IN 1/4"-1/2" OVALS,
10					3150	6	25	SP	FINE TO MEDIUM SAND, 5-10% CLAY, DENSE, DAMP.
						6	35		
11									
12									SAND- REDDISH BROWN WITH MEDIUM GREY MOTTLING IN 1/4"-1/2" OVALS,
13	0.030 INCH SLOT	3/8 SAND				0	10		FINE TO MEDIUM SAND, 5-10% CLAY, DENSE, LOOSE, WET.
					3151	6	12		SILTY SAND- REDDISH BROWN AND OLIVE, MOTTLED, FINE TO COARSES SAND,
14						6	14		30-50% SILT WITH TRACE CLAY, MEDIUM DENSE, WET.
15								SM-ML	
16									
17									
18									
19								SP	
20									

ANANIA GEOLOGIC ENGINEERING

BORING LOG

LOCATION OF BORING



SITE/LOCATION	CARNATION/OAKLAND				BORING NO. MW-14
PROJECT NO.	004-68-059				SHEET 2 OF 2
WATER LEVEL					DRILLER
TIME					START TIME 07:50 / FINISH TIME 08:30
DATE					DATE 3-17-89 / DATE 3-17-89
CASING DEPTH					

DRILLING CONTRACTOR ENSCO SERVICES

DRILLER J R

DRILLING METHOD HOLLOW STEM AUGER

SAMPLING METHOD MPS

LOGGER NICK COFFEE

N/S N 2819.1 E/W E 3055.0 ELEV. 14.80

BORING DIAMETER: 6 INCHES WELL CASING DIAMETER: 2 INCHES

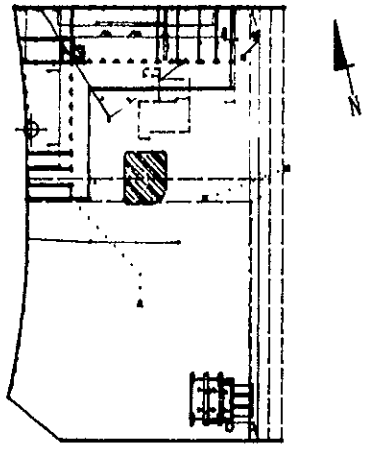
REVIEWED BY: DATE

DIST. FROM SURF.	WELL CONST. CASING	WELL CONST. ANNULUS	LEGEND	TLV READING	SAMPLE NO.	RECOVERY	BLOWS PER 6 IN.	USCS	LOG OF MATERIAL
								SP	
		#3 SAND					17		SAND- REDDISH BROWN WITH GREY OLIVE OVULAR ZONES UP TO 2" DIAMETER,
21					3152		45		MEDIUM, SUB-ROUNDED SAND WITH UP TO 5% SILT + CLAY, WET.
							50/5		
22								TD	
									4 BAGS OF #3 SAND
									1 BAG OF CEMENT
									2/3-5 GALLON BUCKET OF BENTONITE

ANANIA GEOLOGIC ENGINEERING

BORING LOG

LOCATION OF BORING



SITE/LOCATION	CARNATION/OAKLAND
PROJECT NO.	004-86-059
WATER LEVEL	
TIME	
DATE	
CASING DEPTH	
DRILLING CONTRACTOR	ENSCO SERVICES
DRILLER	J R
DRILLING METHOD	HOLLOW STEM AUGER
SAMPLING METHOD	MPS
LOGGER	NICK COFFEE
N/S	N 2565.3
E/W	E 3041.6
ELEV.	14.62
BORING DIAMETER:	6 INCHES
WELL CASING DIAMETER:	2 INCHES
REVIEWED BY:	DATE

BORING NO. MW-15

SHEET 1 OF 2

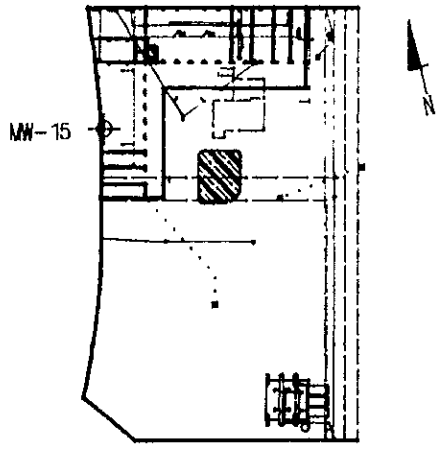
DRILLER START	DRILLER FINISH
TIME 09:00	TIME 10:00
DATE 3-17-89	DATE 3-17-89

DIST. FROM SURF.	WELL CONST. CASING	WELL CONST. SLURRY	LEGEND	TLV READING	SAMPLE NO.	RECOVERY	BLOWS PER 6 IN.	USCS	LOG OF MATERIAL
									CONCRETE
1		4" BENTONITE CEMENT SLURRY						ML	SANDY SILT- DARK REDDISH BROWN, 30 TO 50% VERY FINE TO FINE, SUB-ANGULAR SAND, LOOSE, HUMID.
2									
3									
4	BLANK	3/8" BENT. PELLET				6	6	CL	CLAY- GREY, 3-10% SILT, SOFT, MOIST.
5					3157	6	11	SP	SAND- YELLOWISH BROWN, FINE, ANGULAR TO SUB-ANGULAR, MEDIUM DENSE, DRY.
						6	12		
6								SP-	SAND- REDDISH BROWN, FINE, ANGULAR TO SUB-ANGULAR, WITH UP TO 5% CLAY, MEDIUM DENSE, HUMID.
7									
8								SC	GRADING TO CLAYEY SAND, 10-20% CLAY.
9									
10									
11						6	11		SILTY SAND- YELLOWISH BROWN AND LIGHT OLIVE, MOTTLED, FINE
12					3158	6	21		SUB-ANGULAR SAND WITH 20% SILT + CLAY, LOOSE, MOIST.
	0.030 INCH SLOT	3/4 SAND			3159	6	17		
13									
14									
15									
16									
17									
18									
19							13		
20							21		

ANANIA GEOLOGIC ENGINEERING

BORING LOG

LOCATION OF BORING



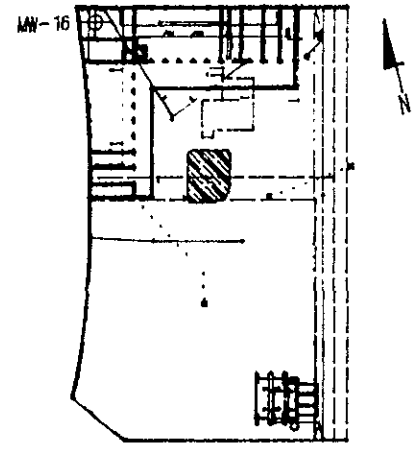
SITE/LOCATION	CARNATION/OAKLAND				BORING NO. MW-15
PROJECT NO.	004-88-059				SHEET 2 OF 2
WATER LEVEL					DRILLER
TIME					START: TIME 09:00; DATE 3-17-89
DATE					FINISH: TIME 10:00; DATE 3-17-89
CASING DEPTH					
DRILLING CONTRACTOR	ENSCO SERVICES				
DRILLER	J R				
DRILLING METHOD	HOLLOW STEM AUGER				
SAMPLING METHOD	MPS				
LOGGER	NICK COFFEE				
N/S	N 2565.3	E/W	E 3041.5	ELEV.	14.82
BORING DIAMETER:	6 INCHES	WELL CASING DIAMETER:	2 INCHES		
REVIEWED BY:		DATE			

DIST. FROM SURF.	WELL CONST. CASING	WELL CONST. ANNULUS	LEGEND	TLV READING	SAMPLE NO.	RECOVERY	BLOWS PER 6 IN.	USCS	LOG OF MATERIAL
					3160		50/5	SM SP	SILTY SAND AND SAND- INTERBEDDED SILTY SAND IS ABOVE; INTERBEDDED
21		#3 SAND						SC	APPROXIMATELY 4" THICK EVERY 6".
									SAND- REDDISH BROWN, FINE TO MEDIUM, SUB-ROUNDED TO SUB-ANGULAR,
22								TD	VERY DENSE, WET.
									4 BAGS OF #3 SAND
									1 BAG OF CEMENT
									2/3-5 GALLON BUCKET OF BENTONITE

ANANIA GEOLOGIC ENGINEERING

BORING LOG

LOCATION OF BORING



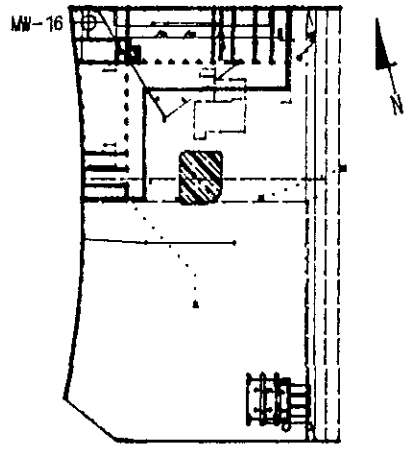
SITE/LOCATION	CARNATION/OAKLAND				BORING NO. MW-16
PROJECT NO.	004-88-059				SHEET 1 OF 2
WATER LEVEL					DRILLER
TIME					START: TIME 13:20, DATE 3-22-89
DATE					FINISH: TIME 16:20, DATE 3-22-89
CASING DEPTH					
DRILLING CONTRACTOR	ENSCO SERVICES				
DRILLER	FRANK BARTOLVICH				
DRILLING METHOD	HOLLOW STEM AUGER				
SAMPLING METHOD					
LOGGER	KARL ANANIA				
N/S	N 2689.0	E/W	E 3067.6	ELEV.	14.78
BORING DIAMETER:	6 INCHES	WELL CASING DIAMETER:	2 INCHES		
REVIEWED BY:		DATE			

DIST. FROM SURF.	WELL CONST. CASING	WELL CONST. ANNULUS	LEGEND	TLV READING	SAMPLE NO.	RECOVERY	BLOWS PER 6 IN.	USCS	LOG OF MATERIAL
									ASPHALT
1		4% BENTONITE CEMENT SLURRY						FILL	BLACK DARK BROWN SOIL.
2									
3	2" PVC BLANK								SANDY SILT- LIGHT BROWN WITH MINOR CLAY, SOFT, MOIST TO DRY, NO ODOR.
4									
5		3/8" BENT. PELL.					6		
6				0	3973		12		
7		#3 SAND					21		
8									
9									
10							9	ML	
11				0	3974		11		SANDY SILT- LIGHT BROWN, BECOMING VERY WET.
12							21		
13	0.030 INCH SLOT								
14									
15									
16									
17									
18									
19									
20									

ANANIA GEOLOGIC ENGINEERING

BORING LOG

LOCATION OF BORING



SITE/LOCATION	CARNATION/OAKLAND				BORING NO. MW-16
PROJECT NO.	004-88-059				SHEET 2 OF 2
WATER LEVEL					DRILLER
TIME					START TIME 13:20 / FINISH TIME 16:20
DATE					START DATE 3-22-89 / FINISH DATE 3-22-89
CASING DEPTH					
DRILLING CONTRACTOR	ENSCO SERVICES				
DRILLER	FRANK BARTOLVICH				
DRILLING METHOD	HOLLOW STEM AUGER				
SAMPLING METHOD	MPS				
LOGGER	KARL ANANIA				
N/S	N 2689.0	E/W	E 3067.6	ELEV.	14.78
BORING DIAMETER:	6 INCHES	WELL CASING DIAMETER:	2 INCHES		
REVIEWED BY:		DATE			

DIST. FROM SURF.	WELL CONST. CASING	WELL CONST. ANNULUS	LEGEND	TLV READING	SAMPLE NO.	RECOVERY	BLOWS PER 6 IN.	USCS	LOG OF MATERIAL
									MINOR SILT- BROWN, LOOSE, FINE WITH COARSE SAND.
21									
22	0.030 INCH SLOT	#3 SAND						SC	
23									
24									
25								TD	
									4 BAGS OF #3 SAND
									1 BAG OF CEMENT
									2/3-5 GALLON BUCKET OF BENTONITE

APPENDIX C

Analytical Results For Soil Samples

Chain Of Custody Forms For Soil Samples

Precision Analytical Laboratory, Inc.
4136 LAKESIDE DRIVE, RICHMOND, CA 94806 PHONE (415) 222-3002 FAX (415) 222-1251

CERTIFICATE OF ANALYSIS

STATE LICENSE NO. 211

Received: 03/15/89
Reported: 03/17/89
Job No. #: 70729

Attn: Tom Edwards
Anania Geological Engineering
11330 Sunrise Park Drive, Suite C
Rancho Cordova, CA. 95742

Total Petroleum Hydrocarbon Analysis
By Modified Method 8015
mg/kg

Lab ID	Client ID	Concentration	Hydrocarbon	Lead
70729-1	3649	ND<10	N/A	5.2
70729-2	3650	ND<10	N/A	7.1

QA/QC: Spike Recovery for Diesel: 83.5%
Spike Recovery for Lead: 85%

MDL: Method detection limit: Compound below this level would not be detected.

Jaime Chow
Laboratory Director

Precision Analytical Laboratory, Inc.
4136 LAKESIDE DRIVE, RICHMOND, CA 94806 PHONE (415) 222-3002 FAX (415) 222-1251

RECEIVED MAR 2 3 1989

CERTIFICATE OF ANALYSIS

State License No. 211

Received: 03/15/89
Reported: 03/17/89
Job No #: 70729

Attn: Tom Edwards
Anania Geological Engineering
11330 Sunrise Park Drive, Suite C
Rancho Cordova, CA. 95742

Project: #004-88-059

Aromatic Volatile Hydrocarbon Analysis:
EPA Method 8020
mg/kg

Lab ID	Client ID	Benzene	Toluene	MDL
70729-1	3649	ND<0.03	ND<0.03	0.03
70729-2	3650	ND<0.03	ND<0.03	0.03

Lab ID	Client ID	Ethylbenzene	Xylene	MDL
70729-1	3649	ND<0.03	ND<0.03	0.03
70729-2	3650	ND<0.03	ND<0.03	0.03

QA/QC: Spike Recovery for BTX Average: 97%

Jaime Chow
Laboratory Director

Precision Analytical Laboratory, Inc.
4136 LAKESIDE DRIVE, RICHMOND, CA 94806 PHONE (415) 222-3002 FAX (415) 222-1251

RECEIVED MAR 24 1989

CERTIFICATE OF ANALYSIS

State License No. 211

Received: 03/17/89
Reported: 03/22/89
Job No #: 70735

Attn: Tom Edwards
Anania Geological Engineering
11330 Sunrise Park Drive, Suite C
Rancho Cordova, CA. 95742

Project: 004-88-059

Total Petroleum Hydrocarbon Analysis: By Modified Method 8015
Oil & Grease Analysis: By Standard Method 503D
mg/kg

Lab ID	Client ID	Diesel	Gasoline	Oil & Grease
70735-1	3657 MW-10	ND<10	N/A	N/A
70735-2	3658 MW-10	ND<10	N/A	N/A
70735-3	3661 MW-9	ND<10	N/A	N/A
70735-4	3662 MW-9	ND<10	N/A	<50
70735-7	3149 MW-14	ND<10	N/A	N/A
70735-8	3150 MW-14	ND<10	N/A	N/A
70735-9	3151 MW-14	ND<10	N/A	N/A
70735-10	3152 MW-14	ND<10	N/A	N/A
70735-11	3157 MW-15	ND<10	N/A	N/A
70735-12	3159 MW-15	ND<10	N/A	N/A
70735-13	3160 MW-15	ND<10	N/A	N/A
70735-14	✓3153 MW-7	ND<10	30	N/A
70735-15	✓3154 MW-7	390	15,660	N/A
70735-16	✓3155 MW-7	ND<10	12	<50
70735-17	✓3156 MW-7	ND<10	ND<10	N/A

QA/QC: Spike Recovery for Gasoline: 113%
Spike Recovery for Diesel: 91.5%
Spike Recovery for Oil & Grease: 99%

Jaime Chow
Laboratory Director

Precision Analytical Laboratory, Inc.
4136 LAKESIDE DRIVE, RICHMOND, CA 94806 PHONE (415) 222-3002 FAX (415) 222-1251

Anania Geological Engineering
Job No. 70735

Lab ID	Client ID	Benzene	Toluene	MDL
70735-11	3157 MW-15	ND<0.03	ND<0.03	0.03
70735-12	3159 MW-15	ND<0.03	ND<0.03	0.03
70735-13	3160 MW-15	ND<0.03	ND<0.03	0.03
70735-14	3153 MW-7	0.32	0.1	0.03
70735-15	3154 MW-7	310	1100	0.03
70735-16	3155 MW-7	3	8	0.03
70735-17	3156 MW-7	0.20	0.30	0.03

Lab ID	Client ID	Ethylbenzene	Xylene	MDL
70735-11	3157 MW-15	ND<0.03	ND<0.03	0.03
70735-12	3159 MW-15	ND<0.03	ND<0.03	0.03
70735-13	3160 MW-15	ND<0.03	ND<0.03	0.03
70735-14	3153 MW-7	<0.03	0.16	0.03
70735-15	3154 MW-7	300	1550	0.03
70735-16	3155 MW-7	13	13	0.03
70735-17	3156 MW-7	0.04	0.20	0.03

Precision Analytical Laboratory, Inc.
4136 LAKESIDE DRIVE, RICHMOND, CA 94806 PHONE (415) 222-3002 FAX (415) 222-1251

CERTIFICATE OF ANALYSIS

STATE LICENSE NO. 211

Received: 03/17/89
Reported: 03/22/89
Job #: 70735

Attn: Tom Edwards
Anania Geological Engineering
11330 Sunrise Park Drive, Suite C.
Rancho Cordova, CA. 95742

Project: #004-88-059

Analysis Method EPA 6010

Lab ID	Client ID	Total Lead	MDL	Units
70735-1	3657 MW-10	5.0	0.044	mg/kg
70735-2	3658 MW-10	10.1	0.044	mg/kg
70735-3	3661 MW-9	7.3	0.044	mg/kg
70735-4	3662 MW-9	8.2	0.044	mg/kg
70735-5	3663 MW-1	0.1	0.044	mg/l
70735-6	3664 MW-10	0.1	0.044	mg/l
70735-7	3149 MW-14	6.4	0.044	mg/kg
70735-8	3150 MW-14	4.6	0.044	mg/kg
70735-9	3151 MW-14	12.1	0.044	mg/kg
70735-10	3152 MW-14	7.3	0.044	mg/kg
70735-11	3157 MW-15	4.0	0.044	mg/kg
70735-12	3159 MW-15	8.1	0.044	mg/kg
70735-13	3160 MW-15	8.6	0.044	mg/kg
70735-14	3153 MW-7	21	0.044	mg/kg
70735-15	3154 MW-7	10.8	0.044	mg/kg
70735-16	3155 MW-7	5.5	0.044	mg/kg
70735-17	3156 MW-7	8.2	0.044	mg/kg

QA/QC: Spike Recovery for Lead: 78 %

MDL: Method detection limit; Compound below this level would not be detected.

Jaime Chow
Laboratory Director

Precision Analytical Laboratory, Inc.
4136 LAKESIDE DRIVE, RICHMOND, CA 94806 PHONE (415) 222-3002 FAX (415) 222-1251

CERTIFICATE OF ANALYSIS

RECEIVED MAR 24 1989

State License No. 211

Received: 03/17/89
Reported: 03/22/89
Job No #: 70735

Attn: Tom Edwards
Anania Geological Engineering
11330 Sunrise Park Drive, Suite C
Rancho Cordova, CA. 95742

Project: #004-88-059

Aromatic Volatile Hydrocarbon Analysis:
EPA Method 8020
mg/kg

Lab ID	Client ID	Benzene	Toluene	MDL
70735-1	3657 MW-10	ND<0.03	ND<0.03	0.03
70735-2	3658 MW-10	ND<0.03	ND<0.03	0.03
70735-3	3661 MW-9	ND<0.03	ND<0.03	0.03
70735-4	3662 MW-9	ND<0.03	ND<0.03	0.03
70735-7	3149 MW-14	ND<0.03	ND<0.03	0.03
70735-8	3150 MW-14	ND<0.03	ND<0.03	0.03
70735-9	3151 MW-14	ND<0.03	ND<0.03	0.03
70735-10	3152 MW-14	ND<0.03	ND<0.03	0.03

Lab ID	Client ID	Ethylbenzene	Xylene	MDL
70735-1	3657 MW-10	ND<0.03	ND<0.03	0.03
70735-2	3658 MW-10	ND<0.03	ND<0.03	0.03
70735-3	3661 MW-9	ND<0.03	ND<0.03	0.03
70735-4	3662 MW-9	ND<0.03	ND<0.03	0.03
70735-7	3149 MW-14	ND<0.03	ND<0.03	0.03
70735-8	3150 MW-14	ND<0.03	ND<0.03	0.03
70735-9	3151 MW-14	ND<0.03	ND<0.03	0.03
70735-10	3152 MW-14	ND<0.03	ND<0.03	0.03

QA/QC: Spike Recovery for BTX Average: 108%

Jaime Chow
Laboratory Director

Precision Analytical Laboratory, Inc.
4136 LAKESIDE DRIVE, RICHMOND, CA 94806 PHONE (415) 222-3002 FAX (415) 222-1251

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CERTIFICATE OF ANALYSIS

State License No. 211

Received: 03/17/89
Reported: 03/22/89
Job No #: 70736

Attn: Mary Scruggs
Anania Geological Engineering
11330 Sunrise Park Drive, Suite C
Rancho Cordova, CA. 95742

Project: #004-88-059

Total Petroleum Hydrocarbon Analysis: By Modified Method 8015
Oil & Grease Analysis: By Standard Method 503D
mg/kg

Lab ID	Client ID	TPH as Diesel	Oil & Grease
70736-1	3164 MW-6	ND<10	<50
70736-2	3165 MW-6	ND<10	<50
70736-3	3166 MW-6	ND<10	<50

QA/QC: Spike Recovery for Diesel: 101%
Spike Recovery for Oil & Grease: 99%

Detection limit for Diesel: 10
Detection limit for Oil & Grease: 50

Jaime Chow
Laboratory Director

Precision Analytical Laboratory, Inc.
4136 LAKESIDE DRIVE, RICHMOND, CA 94806 PHONE (415) 222-3002 FAX (415) 222-1251

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STATE LICENSE NO. 211

Received: 03/17/89
Reported: 03/22/89
Job #: 70736

Attn: Mary Scruggs
Anania Geological Engineering
11330 Sunrise Park Drive, Suite C
Rancho Cordova, CA. 95742

Analysis Method EPA 6010
Prep Method EPA 3050
mg/kg

Lab ID	Client ID	Lead	MDL
70736-1	3164 MW-6	19	1.1
70736-2	3165 MW-6	10.1	1.1
70736-3	3166 mw-6	9.7	1.1

QA/QC: Spike Recovery for Lead: 74 %

MDL: Method detection Limit: Compound below this level would not be detected.

Jaime Chow
Laboratory Director

Precision Analytical Laboratory, Inc.
4136 LAKESIDE DRIVE, RICHMOND, CA 94806 PHONE (415) 222-3002 FAX (415) 222-1251

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CERTIFICATE OF ANALYSIS

State License No. 211

Received: 03/18/89
Reported: 03/22/89
Job No #: 70736

Attn: Mary Scruggs
Anania Geological Engineering
11330 Sunrise Park Drive, Suite C
Rancho Cordova, CA. 95742

Project: #004-88-059

Aromatic Volatile Hydrocarbon Analysis:
EPA Method 8020
mg/kg

Lab ID	Client ID	Benzene	Toluene	MDL
70736-1	3164 MW-6	0.1	0.08	0.03
70736-2	3165 MW-6	0.04	0.04	0.03
70736-3	3166 MW-6	<0.03	0.03	0.03

Lab ID	Client ID	Ethylbenzene	Xylene	MDL
70736-1	3164 MW-6	<0.03	0.11	0.03
70736-2	3165 MW-6	<0.03	<0.03	0.03
70736-3	3166 MW-6	<0.03	<0.03	0.03

QA/QC: Spike Recovery for BTX Average: 74%

Jaime Chow
Laboratory Director

Precision Analytical Laboratory, Inc.
4136 LAKESIDE DRIVE, RICHMOND, CA 94806 PHONE (415) 222-3002 FAX (415) 222-1251

CERTIFICATE OF ANALYSIS

State License No. 211

Received: 03/21/89
Reported: 03/31/89
Job No #: 70738

Attn: Mary Scruggs
Anania Geological Engineering
11330 Sunrise Park Drive, Suite C
Rancho Cordova, CA. 95742

Project: #004-88-059

Total Petroleum Hydrocarbon Analysis:
By EPA 5030 & DHS Extraction Method
Oil & Grease Analysis: By Standard Method 503D
Total Lead: By EPA 6010
mg/kg

Lab ID	Client ID	Gasoline	Oil & Grease	Total Lead
70738-1	3681 MW-4 4'	ND<10	N/A	ND<1.1
70738-2	3682 MW-4 9.5'	ND<10	<50	ND<1.1
70738-3	3161 MW-8 4.5'	ND<10	N/A	ND<1.1
70738-4	3162 MW-8 9.5'	5,960	1220	1.5
70738-5	3163 MW-8 16.5'	ND<10	N/A	ND<1.1

QA/QC: Spike Recovery for Gasoline: 97%
Spike Recovery for Oil & Grease: 100%
Spike Recovery for Total Lead: 76%

Detection Limit for Gasoline: 10
Detection Limit for Oil & Grease: 50
Detection Limit for Lead: 1.1

Jaime Chow
Laboratory Director

Precision Analytical Laboratory, Inc.
4136 LAKESIDE DRIVE, RICHMOND, CA 94806 PHONE (415) 222-3002 FAX (415) 222-1251

CERTIFICATE OF ANALYSIS

State License No. 211

Received: 03/21/89
Reported: 03/31/89
Job No #: 70738

Attn: Mary Scruggs
Anania Geological Engineering
11330 Sunrise Park Drive, Suite C
Rancho Cordova, CA. 95742

Project: #004-88-059

Aromatic Volatile Hydrocarbon Analysis:
EPA Method 8020
mg/kg

Lab ID	Client ID	Benzene	Toluene	MDL
70738-1	3681 MW-4 4'	<0.03	0.07	0.03
70738-2	3682 MW-4 9.5'	ND<0.03	<0.03	0.03
70738-3	3161 MW-8 4.5'	0.04	0.03	0.03
70738-4	3162 MW-8 9.5'	37	210	0.03
70738-5	3163 MW-8 16.5'	0.05	0.16	0.03

Lab ID	Client ID	Ethylbenzene	Xylene	MDL
70738-1	3681 MW-4 4'	0.05	0.3	0.03
70738-2	3682 MW-4 9.5'	<0.03	0.09	0.03
70738-3	3161 MW-8 4.5'	<0.03	0.12	0.03
70738-4	3162 MW-8 9.5'	60	320	0.03
70738-5	3163 MW-8 16.5'	0.04	0.21	0.03

Jaime Chow
Laboratory Director

Clayton Environmental Consultants, Inc.

P.O. Box 9019 • 1252 Quarry Lane • Pleasanton, CA 94566 • (415) 426-2600

RECEIVED MAR 2 4 1989

March 23, 1989

Mr. Karl Anania
ANANIA GEOLOGICAL ENGINEERING
11330 Sunrise Park Dr.
Suite C
Rancho Cordova, CA 95742

Client Ref. No.: 004-88-059
Lab Batch No.: 8903126
Clayton Project No.: 22575.00
Client Code No.: 0636

Dear Mr. Anania:

Attached is our analytical laboratory report for the samples received on March 20, 1989. Results were sent to you by facsimile on March 23, 1989. A copy of the Chain of Custody form acknowledging receipt of these samples is attached.

Please note that any unused portion of the samples will be retained at our facility for approximately 30 days after the date of this report, unless you have requested otherwise.

We appreciate the opportunity to be of assistance to you. If you have any questions, please contact Client Services at (415) 426-2657.

Sincerely,

Ronald H. Peters, CIH
Manager, Laboratory Services

RHP/mn
Attachment

EPA METHOD 8240
PURGEABLE ORGANICS
(LOW-LEVEL METHOD)

Sample I.D.:	3164 MW-6	Client:	ANANIA GEOLOGICAL ENG.
Sample Received:	03/20/89	Client Ref. No.:	004-88-059
Sample Analyzed:	03/20/89	Lab Client Code:	0636
Sample Matrix:	Soil	Lab No.:	8903126-01

Compound	Concentration µg/kg (ppb)	Limit of Detection µg/kg (ppb)
Chloromethane	ND	10
Bromomethane	ND	4
Vinyl chloride	ND	4
Chloroethane	ND	4
Methylene chloride	ND	10
Trichlorofluoromethane	ND	3
1,1-dichloroethene	ND	3
1,1-dichloroethane	ND	3
Trans-1,2-dichloroethene	ND	3
Chloroform	ND	3
1,2-dichloroethane	6	3
1,1,1-trichloroethane	ND	3
Carbon tetrachloride	ND	3
Bromodichloromethane	ND	3
1,2-dichloropropane	ND	3
Cis-1,3-dichloropropene	ND	3
Trichloroethene	ND	4
Benzene	130	2
Dibromochloromethane	ND	2
1,1,2-trichloroethane	ND	6
Trans-1,3-dichloropropene	ND	5
2-chloroethylvinylether	ND	3
Bromoform	ND	3
1,1,2,2-tetrachloroethane	ND	4
Tetrachloroethene	ND	4
Toluene	47	2
Chlorobenzene	ND	3
Ethylbenzene	8	3
1,3-dichlorobenzene	ND	3
1,2-dichlorobenzene	ND	3
1,4-dichlorobenzene	ND	3
Freon 113	ND	3
Total Xylenes	30	3

ND = Not detected at or above limit of detection.

EPA METHOD 8240
PURGEABLE ORGANICS
(LOW-LEVEL METHOD)

Sample I.D.:	3165 MW-6	Client:	ANANIA GEOLOGICAL ENG.
Sample Received:	03/20/89	Client Ref. No.:	004-88-059
Sample Analyzed:	03/20/89	Lab Client Code:	0636
Sample Matrix:	Soil	Lab No.:	8903126-02

Compound	Concentration µg/kg (ppb)	Limit of Detection µg/kg (ppb)
Chloromethane	ND	10
Bromomethane	ND	4
Vinyl chloride	ND	4
Chloroethane	ND	4
Methylene chloride	ND	10
Trichlorofluoromethane	ND	3
1,1-dichloroethene	ND	3
1,1-dichloroethane	ND	3
Trans-1,2-dichloroethene	ND	3
Chloroform	ND	3
1,2-dichloroethane	ND	3
1,1,1-trichloroethane	ND	3
Carbon tetrachloride	ND	3
Bromodichloromethane	ND	3
1,2-dichloropropane	ND	3
Cis-1,3-dichloropropene	ND	3
Trichloroethene	ND	4
Benzene	6	2
Dibromochloromethane	ND	2
1,1,2-trichloroethane	ND	6
Trans-1,3-dichloropropene	ND	5
2-chloroethylvinylether	ND	3
Bromoform	ND	3
1,1,2,2-tetrachloroethane	ND	4
Tetrachloroethene	ND	4
Toluene	8	2
Chlorobenzene	ND	3
Ethylbenzene	ND	3
1,3-dichlorobenzene	ND	3
1,2-dichlorobenzene	ND	3
1,4-dichlorobenzene	ND	3
Freon 113	ND	3
Total Xylenes	ND	3

ND = Not detected at or above limit of detection.

EPA METHOD 8240
PURGEABLE ORGANICS
(LOW-LEVEL METHOD)

Sample I.D.:	3155 MW-7	Client:	ANANIA GEOLOGIC ENG.
Sample Received:	03/20/89	Client Ref. No.:	004-88-059
Sample Analyzed:	03/20/89	Lab Client Code:	0636
Sample Matrix:	Soil	Lab No.:	8903126-03

Compound	Concentration µg/kg (ppb)	Limit of Detection µg/kg (ppb)
Chloromethane	ND	50
Bromomethane	ND	20
Vinyl chloride	ND	20
Chloroethane	ND	20
Methylene chloride	ND	50
Trichlorofluoromethane	ND	15
1,1-dichloroethene	ND	15
1,1-dichloroethane	ND	15
Trans-1,2-dichloroethene	ND	15
Chloroform	ND	15
1,2-dichloroethane	ND	15
1,1,1-trichloroethane	ND	15
Carbon tetrachloride	ND	15
Bromodichloromethane	ND	15
1,2-dichloropropane	ND	15
Cis-1,3-dichloropropene	ND	15
Trichloroethene	ND	20
Benzene	310	10
Dibromochloromethane	ND	10
1,1,2-trichloroethane	ND	30
Trans-1,3-dichloropropene	ND	25
2-chloroethylvinylether	ND	15
Bromoform	ND	15
1,1,2,2-tetrachloroethane	ND	20
Tetrachloroethene	ND	20
Toluene	850	10
Chlorobenzene	ND	15
Ethylbenzene	150	15
1,3-dichlorobenzene	ND	15
1,2-dichlorobenzene	ND	15
1,4-dichlorobenzene	ND	15
Freon 113	ND	15
Total Xylenes	750	15

ND = Not detected at or above limit of detection.

EPA METHOD 8240
PURGEABLE ORGANICS
(LOW-LEVEL METHOD)

Sample I.D.:	Method Blank	Client:	ANANIA GEOLOGICAL ENG.
Sample Received:		Client Ref. No.:	004-88-059
Sample Analyzed:	03/20/89	Lab Client Code:	0636
Sample Matrix:	Soil	Lab No.:	8903126-MB

Compound	Concentration µg/kg (ppb)	Limit of Detection µg/kg (ppb)
Chloromethane	ND	10
Bromomethane	ND	4
Vinyl chloride	ND	4
Chloroethane	ND	4
Methylene chloride	ND	10
Trichlorofluoromethane	ND	3
1,1-dichloroethene	ND	3
1,1-dichloroethane	ND	3
Trans-1,2-dichloroethene	ND	3
Chloroform	ND	3
1,2-dichloroethane	ND	3
1,1,1-trichloroethane	ND	3
Carbon tetrachloride	ND	3
Bromodichloromethane	ND	3
1,2-dichloropropane	ND	3
Cis-1,3-dichloropropene	ND	3
Trichloroethene	ND	4
Benzene	ND	2
Dibromochloromethane	ND	2
1,1,2-trichloroethane	ND	6
Trans-1,3-dichloropropene	ND	5
2-chloroethylvinylether	ND	3
Bromoform	ND	3
1,1,2,2-tetrachloroethane	ND	4
Tetrachloroethene	ND	4
Toluene	ND	2
Chlorobenzene	ND	3
Ethylbenzene	ND	3
1,3-dichlorobenzene	ND	3
1,2-dichlorobenzene	ND	3
1,4-dichlorobenzene	ND	3
Freon 113	ND	3
Total Xylenes	ND	3

ND = Not detected at or above limit of detection.

EPA METHOD 8270
BASE/NEUTRALS AND ACIDS
(LOW LEVEL METHOD)

Sample I.D.:	3164 MW-6 5'	Client:	ANANIA GEOLOGICAL ENG.
Sample Received:	03/20/89	Client Ref. No.:	004-88-059
Sample Analyzed:	03/22/89	Lab Client Code:	0636
Sample Matrix:	Soil	Lab No.:	8903126-01

	Concentration µg/kg (ppb)	Limit of Detection µg/kg (ppb)
ACID COMPOUNDS		
Phenol	60	30
2-chlorophenol	ND	30
2-methyl phenol	ND	30
4-methyl phenol	ND	30
2-nitrophenol	ND	30
2,4-dimethylphenol	ND	30
2,4-dichlorophenol	ND	30
4-chloro-3-methylphenol	ND	30
2,4,5-trichlorophenol	ND	30
2,4,6-trichlorophenol	ND	30
2,4-dinitrophenol	ND	200
4-nitrophenol	ND	200
2-methyl-4,6-dinitrophenol	ND	30
pentachlorophenol	ND	30
BASE/NEUTRAL COMPOUNDS		
N-nitrosodimethylamine	ND	200
Bis(2-chloroethyl)ether	ND	30
1,3-dichlorobenzene	ND	30
1,4-dichlorobenzene	ND	30
1,2-dichlorobenzene	ND	30
Bis-(2-chloroisopropyl)ether	ND	30
N-nitrosodi-n-propylamine	ND	30
Hexachloroethane	ND	30
Nitrobenzene	ND	30
Isophorone	ND	30
Bis-(2-chloroethoxy)methane	ND	30
1,2,4-trichlorobenzene	ND	30
naphthalene	ND	30
hexachlorobutadiene	ND	30
2-chloronaphthalene	ND	30
2- Methyl Napthalene	ND	30

ND = Not detected at or above limit of detection

EPA METHOD 8270
BASE/NEUTRALS AND ACIDS
(LOW LEVEL METHOD)
(Cont.d)

Sample I.D.: 3164 MW-6 Client: ANANIA GEOLOGICAL ENG.

	Concentration µg/kg (ppb)	Limit of Detection µg/kg (ppb)
BASE/NEUTRAL COMPOUNDS		
4-chloroaniline	ND	200
2-nitroaniline	ND	200
3-nitroaniline	ND	200
4-nitroaniline	ND	200
hexachlorocyclopentadiene	ND	30
dimethyl phthalate	ND	300
acenaphthylene	ND	30
acenaphthene	ND	30
2,4-dinitrotoluene	ND	30
2,6-dinitrotoluene	ND	30
diethyl phthalate	ND	30
4-chlorophenylphenylether	ND	30
fluorene	ND	30
N-nitrosodiphenylamine	ND	30
4-bromophenylphenylether	ND	30
hexachlorobenzene	ND	30
phenanthrene	ND	30
anthracene	ND	30
di-n-butylphthalate	ND	30
fluoranthene	ND	30
benzidine	ND	1000
pyrene	ND	30
benzylbutylphthalate	ND	30
3,3'-dichlorobenzidine	ND	1000
benzo(a)anthracene	ND	30
bis-(2-ethylhexyl)phthalate	ND	300
Chrysene	ND	70
di-n-octylphthalate	ND	30
benzo(b)fluoranthene	ND	70
benzo(k)fluoranthene	ND	30
benzo(a)pyrene	ND	30
indeno(1,2,3-cd)pyrene	ND	30
dibenzo(a,h)anthracene	ND	30
benzo(ghi)perylene	ND	30
Dibenzofuran	ND	30
Benzoic Acid	ND	200
Benzyl Alcohol	ND	30

ND = Not detected at or above limit of detection

EPA METHOD 8270
BASE/NEUTRALS AND ACIDS
(LOW LEVEL METHOD)

Sample I.D.:	3165 MW-6	Client:	ANANIA GEOLOGICAL ENG.
Sample Received:	03/20/89	Client Ref. No.:	004-88-059
Sample Analyzed:	03/22/89	Lab Client Code:	0636
Sample Matrix:	Soil	Lab No.:	8903126-02

	Concentration µg/kg (ppb)	Limit of Detection µg/kg (ppb)
ACID COMPOUNDS		
Phenol	ND	30
2-chlorophenol	ND	30
2-methyl phenol	ND	30
4-methyl phenol	ND	30
2-nitrophenol	ND	30
2,4-dimethylphenol	ND	30
2,4-dichlorophenol	ND	30
4-chloro-3-methylphenol	ND	30
2,4,5-trichlorophenol	ND	30
2,4,6-trichlorophenol	ND	30
2,4-dinitrophenol	ND	200
4-nitrophenol	ND	200
2-methyl-4,6-dinitrophenol	ND	30
pentachlorophenol	ND	30
BASE/NEUTRAL COMPOUNDS		
N-nitrosodimethylamine	ND	200
Bis(2-chloroethyl)ether	ND	30
1,3-dichlorobenzene	ND	30
1,4-dichlorobenzene	ND	30
1,2-dichlorobenzene	ND	30
Bis-(2-chloroisopropyl)ether	ND	30
N-nitrosodi-n-propylamine	ND	30
Hexachloroethane	ND	30
Nitrobenzene	ND	30
Isophorone	ND	30
Bis-(2-chloroethoxy)methane	ND	30
1,2,4-trichlorobenzene	ND	30
naphthalene	ND	30
hexachlorobutadiene	ND	30
2-chloronaphthalene	ND	30
2- Methyl Napthalene	ND	30

ND = Not detected at or above limit of detection

EPA METHOD 8270
BASE/NEUTRALS AND ACIDS
(LOW LEVEL METHOD)
(Cont.d)

Sample I.D.: 3165 MW-6 Client: ANANIA GEOLOGICAL ENG.

	Concentration µg/kg (ppb)	Limit of Detection µg/kg (ppb)
BASE/NEUTRAL COMPOUNDS		
4-chloroaniline	ND	200
2-nitroaniline	ND	200
3-nitroaniline	ND	200
4-nitroaniline	ND	200
hexachlorocyclopentadiene	ND	30
dimethyl phthalate	ND	300
acenaphthylene	ND	30
ačenaphthene	ND	30
2,4-dinitrotoluene	ND	30
2,6-dinitrotoluene	ND	30
diethyl phthalate	ND	30
4-chlorophenylphenylether	ND	30
fluorene	ND	30
N-nitrosodiphenylamine	ND	30
4-bromophenylphenylether	ND	30
hexachlorobenzene	ND	30
phenanthrene	ND	30
anthracene	ND	30
di-n-butylphthalate	ND	30
fluoranthene	ND	30
benzidine	ND	1000
pyrene	ND	30
benzylbutylphthalate	ND	30
3,3'-dichlorobenzidine	ND	1000
benzo(a)anthracene	ND	30
bis-(2-ethylhexyl)phthalate	ND	300
Chrysene	ND	70
di-n-octylphthalate	ND	30
benzo(b)fluoranthene	ND	70
benzo(k)fluoranthene	ND	30
benzo(a)pyrene	ND	30
indeno(1,2,3-cd)pyrene	ND	30
dibenzo(a,h)anthracene	ND	30
benzo(ghi)perylene	ND	30
Dibenzofuran	ND	30
Benzoic Acid	ND	200
Benzyl Alcohol	ND	30

ND = Not detected at or above limit of detection

EPA METHOD 8270
BASE/NEUTRALS AND ACIDS
(LOW LEVEL METHOD)

Sample I.D.:	3155 MW-7	Client:	ANANIA GEOLOGICAL ENG.
Sample Received:	03/20/89	Client Ref. No.:	004-88-059
Sample Analyzed:	03/22/89	Lab Client Code:	0636
Sample Matrix:	Soil	Lab No.:	8903126-03

	Concentration µg/kg (ppb)	Limit of Detection µg/kg (ppb)
ACID COMPOUNDS		
Phenol	ND	30
2-chlorophenol	ND	30
2-methyl phenol	ND	30
4-methyl phenol	ND	30
2-nitrophenol	ND	30
2,4-dimethylphenol	ND	30
2,4-dichlorophenol	ND	30
4-chloro-3-methylphenol	ND	30
2,4,5-trichlorophenol	ND	30
2,4,6-trichlorophenol	ND	30
2,4-dinitrophenol	ND	200
4-nitrophenol	ND	200
2-methyl-4,6-dinitrophenol	ND	30
pentachlorophenol	ND	30
BASE/NEUTRAL COMPOUNDS		
N-nitrosodimethylamine	ND	200
Bis(2-chloroethyl)ether	ND	30
1,3-dichlorobenzene	ND	30
1,4-dichlorobenzene	ND	30
1,2-dichlorobenzene	ND	30
Bis-(2-chloroisopropyl)ether	ND	30
N-nitrosodi-n-propylamine	ND	30
Hexachloroethane	ND	30
Nitrobenzene	ND	30
Isophorone	ND	30
Bis-(2-chloroethoxy)methane	ND	30
1,2,4-trichlorobenzene	ND	30
naphthalene	ND	30
hexachlorobutadiene	ND	30
2-chloronaphthalene	ND	30
2- Methyl Napthalene	ND	30

ND = Not detected at or above limit of detection

EPA METHOD 8270
BASE/NEUTRALS AND ACIDS
(LOW LEVEL METHOD)
(Cont.d)

Sample I.D.: 3155 MW-7 Client: ANANIA GEOLOGICAL ENG.

	Concentration µg/kg (ppb)	Limit of Detection µg/kg (ppb)
BASE/NEUTRAL COMPOUNDS		
4-chloroaniline	ND	200
2-nitroaniline	ND	200
3-nitroaniline	ND	200
4-nitroaniline	ND	200
hexachlorocyclopentadiene	ND	30
dimethyl phthalate	ND	300
acenaphthylene	ND	30
acenaphthene	ND	30
2,4-dinitrotoluene	ND	30
2,6-dinitrotoluene	ND	30
diethyl phthalate	ND	30
4-chlorophenylphenylether	ND	30
fluorene	ND	30
N-nitrosodiphenylamine	ND	30
4-bromophenylphenylether	ND	30
hexachlorobenzene	ND	30
phenanthrene	ND	30
anthracene	ND	30
di-n-butylphthalate	69	30
fluoranthene	ND	30
benzidine	ND	1000
pyrene	ND	30
benzylbutylphthalate	ND	30
3,3'-dichlorobenzidine	ND	1000
benzo(a)anthracene	ND	30
bis-(2-ethylhexyl)phthalate	ND	300
Chrysene	ND	70
di-n-octylphthalate	ND	30
benzo(b)fluoranthene	ND	70
benzo(k)fluoranthene	ND	30
benzo(a)pyrene	ND	30
indeno(1,2,3-cd)pyrene	ND	30
dibenzo(a,h)anthracene	ND	30
benzo(ghi)perylene	ND	30
Dibenzofuran	ND	30
Benzoic Acid	ND	200
Benzyl Alcohol	ND	30

ND = Not detected at or above limit of detection

EPA METHOD 8270
BASE/NEUTRALS AND ACIDS
(LOW LEVEL METHOD)

Sample I.D.:	Method Blank	Client:	ANANIA GEOLOGICAL ENG.
Sample Received:		Client Ref. No.:	004-88-059
Sample Analyzed:	03/22/89	Lab Client Code:	0636
Sample Matrix:	Soil	Lab No.:	8903126-MB

	Concentration µg/kg (ppb)	Limit of Detection µg/kg (ppb)
ACID COMPOUNDS		
Phenol	ND	30
2-chlorophenol	ND	30
2-methyl phenol	ND	30
4-methyl phenol	ND	30
2-nitrophenol	ND	30
2,4-dimethylphenol	ND	30
2,4-dichlorophenol	ND	30
4-chloro-3-methylphenol	ND	30
2,4,5-trichlorophenol	ND	30
2,4,6-trichlorophenol	ND	30
2,4-dinitrophenol	ND	200
4-nitrophenol	ND	200
2-methyl-4,6-dinitrophenol	ND	30
pentachlorophenol	ND	30
BASE/NEUTRAL COMPOUNDS		
N-nitrosodimethylamine	ND	200
Bis(2-chloroethyl)ether	ND	30
1,3-dichlorobenzene	ND	30
1,4-dichlorobenzene	ND	30
1,2-dichlorobenzene	ND	30
Bis-(2-chloroisopropyl)ether	ND	30
N-nitrosodi-n-propylamine	ND	30
Hexachloroethane	ND	30
Nitrobenzene	ND	30
Isophorone	ND	30
Bis-(2-chloroethoxy)methane	ND	30
1,2,4-trichlorobenzene	ND	30
naphthalene	ND	30
hexachlorobutadiene	ND	30
2-chloronaphthalene	ND	30
2- Methyl Napthalene	ND	30

ND = Not detected at or above limit of detection

EPA METHOD 8270
BASE/NEUTRALS AND ACIDS
(LOW LEVEL METHOD)
(Cont.d)

Sample I.D.: Method Blank Client: ANANIA GEOLOGICAL ENG.

	Concentration µg/kg (ppb)	Limit of Detection µg/kg (ppb)
BASE/NEUTRAL COMPOUNDS		
4-chloroaniline	ND	200
2-nitroaniline	ND	200
3-nitroaniline	ND	200
4-nitroaniline	ND	200
hexachlorocyclopentadiene	ND	30
dimethyl phthalate	ND	300
acenaphthylene	ND	30
acenaphthene	ND	30
2,4-dinitrotoluene	ND	30
2,6-dinitrotoluene	ND	30
diethyl phthalate	ND	30
4-chlorophenylphenylether	ND	30
fluorene	ND	30
N-nitrosodiphenylamine	ND	30
4-bromophenylphenylether	ND	30
hexachlorobenzene	ND	30
phenanthrene	ND	30
anthracene	ND	30
di-n-butylphthalate	ND	30
fluoranthene	ND	30
benzidine	ND	1000
pyrene	ND	30
benzylbutylphthalate	ND	30
3,3'-dichlorobenzidine	ND	1000
benzo(a)anthracene	ND	30
bis-(2-ethylhexyl)phthalate	ND	300
Chrysene	ND	70
di-n-octylphthalate	ND	30
benzo(b)fluoranthene	ND	70
benzo(k)fluoranthene	ND	30
benzo(a)pyrene	ND	30
indeno(1,2,3-cd)pyrene	ND	30
dibenzo(a,h)anthracene	ND	30
benzo(ghi)perylene	ND	30
Dibenzofuran	ND	30
Benzoic Acid	ND	200
Benzyl Alcohol	ND	30

ND = Not detected at or above limit of detection

AGE

ANANIA GEOLOGIC ENGINEERING

PROJECT NO.	LAB REPORT NO.	
004-88-059		
P.O. NO.	SAMPLERS: (signature)	[illegible signature]

LAB LOG NO.	DATE	TIME	SAMPLE I.D.	NO. OF CONTAINERS	SOIL COMP	SOIL GRAB	WATER	TPH	BTXE	Total Pb	8240	8270	[illegible]		REMARKS
	3/16	13:30	3153/MW7	1		X		X	X	X					
	3/16	13:40	3154/MW7	1		X		X	X	X					
	3/16	[illegible]	3155/MW7	1		X		X	X	X	X	X	—		
	3/16	[illegible]	3156/MW7	1		X		X	X	X					
			~~[illegible]~~	~~5~~											
			[illegible]												

RELINQUISHED BY: (signature)	DATE/TIME	RECEIVED BY: (signature)	REMARKS:	SEND RESULTS TO:
[illegible signature]	3/17 [illegible]	[illegible signature]	[illegible]	AGE
RELINQUISHED BY: (signature)	DATE/TIME	RECEIVED BY: (signature)		ATTN: [illegible]
[illegible signature]	3/17 [illegible]	[illegible signature]	3days	[illegible address]
RELINQUISHED BY: (signature)	DATE/TIME	RECEIVED BY: (signature)		
[illegible signature]	3-20-89 2:00pm	Terry Salio		PHONE NO. (916) 451-0921

CHAIN OF CUSTODY

White-AGE Yellow-LAB Copy Pink-File

Precision Analytical Laboratory, Inc.
4136 LAKESIDE DRIVE, RICHMOND, CA 94806 PHONE (415) 222-3002 FAX (415) 222-1251

RECEIVED MAR 3 1 1989

CERTIFICATE OF ANALYSIS

State License No. 211

Received: 03/21/89
Reported: 03/31/89
Job No #: 70738

Attn: Mary Scruggs
Anania Geological Engineering
11330 Sunrise Park Drive, Suite C
Rancho Cordova, CA. 95742

Project: #004-88-059

Aromatic Volatile Hydrocarbon Analysis:
EPA Method 8020
mg/kg

Lab ID	Client ID	Benzene	Toluene	MDL
70738-1	3681 MW-4 4'	<0.03	0.07	0.03
70738-2	3682 MW-4 9.5'	ND<0.03	<0.03	0.03
70738-3	3161 MW-8 4.5'	0.04	0.03	0.03
70738-4	3162 MW-8 9.5'	37	210	0.03
70738-5	3163 MW-8 16.5'	0.05	0.16	0.03

Lab ID	Client ID	Ethylbenzene	Xylene	MDL
70738-1	3681 MW-4 4'	0.05	0.3	0.03
70738-2	3682 MW-4 9.5'	<0.03	0.09	0.03
70738-3	3161 MW-8 4.5'	<0.03	0.12	0.03
70738-4	3162 MW-8 9.5'	60	320	0.03
70738-5	3163 MW-8 16.5'	0.04	0.21	0.03

Jaime Chow
Laboratory Director

Precision Analytical Laboratory, Inc.
4136 LAKESIDE DRIVE, RICHMOND, CA 94806 PHONE (415) 222-3002 FAX (415) 222-1251

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Received: 03/21/89
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Job No #: 70738

Attn: Mary Scruggs
Anania Geological Engineering
11330 Sunrise Park Drive, Suite C
Rancho Cordova, CA. 95742

Project: #004-88-059

Total Petroleum Hydrocarbon Analysis:
By EPA 5030 & DHS Extraction Method
Oil & Grease Analysis: By Standard Method 503D
Total Lead: By EPA 6010
mg/kg

Lab ID	Client ID	Gasoline	Oil & Grease	Total Lead
70738-1	3681 MW-4 4'	ND<10	N/A	ND<1.1
70738-2	3682 MW-4 9.5'	ND<10	<50	ND<1.1
70738-3	3161 MW-8 4.5'	ND<10	N/A	ND<1.1
70738-4	3162 MW-8 9.5'	5,960	1220	1.5
70738-5	3857 MW-8 16.5'	ND<10	N/A	ND<1.1

QA/QC: Spike Recovery for Gasoline: 97%
Spike Recovery for Oil & Grease: 100%
Spike Recovery for Total Lead: 76%

Detection Limit for Gasoline: 10
Detection Limit for Oil & Grease: 50
Detection Limit for Lead: 1.1

Jaime Chow
Laboratory Director

Precision Analytical Laboratory, Inc.
4136 LAKESIDE DRIVE, RICHMOND, CA 94806 PHONE (415) 222-3002 FAX (415) 222-1251

CERTIFICATE OF ANALYSIS

State License No. 211

Received: 03/23/89
Reported: 03/27/89
Job No #: 70748

Attn: Tom Edwards
Anania Geological Engineering
11330 Sunrise Park Drive, Suite C
Rancho Cordova, CA. 95742

Project: #004-88-059

Total Petroleum Hydrocarbon Analysis: By Modified Method 8015
Oil & Grease Analysis: By Standard Method 503D
mg/kg

Lab ID	Client ID	Diesel	Gasoline	Oil & Grease	Total Lead
70748-1	3671 MW-11 5'	ND<10	ND<10	N/A	4.4
70748-2	3672 MW-11 9'	ND<10	ND<10	<50	4.5
70748-3	3679 MW-12 4'	ND<10	ND<10	N/A	9.5
70748-4	3680 MW-12 9'	ND<10	ND<10	<50	5.6
70748-5	3829 MW-3 4'	ND<10	ND<10	N/A	2.3
70748-6	3833 MW-3 9'	ND<10	ND<10	<50	3.9
70748-7	3838 MW-2 4.5'	ND<10	ND<10	N/A	5.8
70748-8	3839 MW-2 9.5'	ND<10	ND<10	<50	4.7
70748-9	3965 MW-5 6'	ND<10	ND<10	65	7.4
70748-10	3966 MW-5 10'	<10	<10	115	7.9
70748-11	3969 MW-13 6'	ND<10	ND<10	<50	10.1
70748-12	3970 MW-13 9'	ND<10	ND<10	<50	10.5
70748-13	3973 MW-16 6'	ND<10	ND<10	<50	8.4
70748-14	3974 MW-16 11'	ND<10	ND<10	<50	5.9

QA/QC: Spike Recovery for Diesel: 112%
Spike Recovery for Oil & Grease: 100%
Spike Recovery for Lead: 85%

Detection Limit for Diesel: 10
Detection Limit for Oil & Grease: 50
Detection Limit for Lead: 0.044

Jaime Chow
Laboratory Director

Precision Analytical Laboratory, Inc.
4136 LAKESIDE DRIVE, RICHMOND, CA 94806 PHONE (415) 222-3002 FAX (415) 222-1251

CERTIFICATE OF ANALYSIS

State License No. 211

Received: 03/23/89
Reported: 03/27/89
Job No #: 70748

Attn: Tom Edwards
Anania Geological Engineering
11330 Sunrise Park Drive, Suite C
Rancho Cordova, CA. 95742

Project: #004-88-059

Aromatic Volatile Hydrocarbon Analysis: EPA Method 8020 mg/kg

Lab ID	Client ID	Benzene	Toluene	MDL
70748-1	3671 MW-11 5'	0.03	0.03	0.03
70748-2	3672 MW-11 9'	<0.03	0.04	0.03
70748-3	3679 MW-12 4'	<0.03	0.04	0.03
70748-4	3680 MW-12 9'	<0.03	0.04	0.03
70748-5	3829 MW-3 4'	<0.03	0.04	0.03
70748-6	3833 MW-3 9'	0.03	0.05	0.03
70748-7	3838 MW-2 4.5'	<0.03	0.04	0.03
70748-8	3839 MW-2 9.5'	<0.03	0.035	0.03

Lab ID	Client ID	Ethylbenzene	Xylene	MDL
70748-1	3671 MW-11 5'	<0.03	0.05	0.03
70748-2	3672 MW-11 9'	<0.03	0.04	0.03
70748-3	3679 MW-12 4'	<0.03	0.05	0.03
70748-4	3680 MW-12 9'	<0.03	0.05	0.03
70748-5	3829 MW-3 4'	<0.03	0.07	0.03
70748-6	3833 MW-3 9'	<0.03	0.05	0.03
70748-7	3838 MW-2 4.5'	<0.03	0.05	0.03
70748-8	3839 MW-2 9.5'	<0.03	0.04	0.03

QA/QC: Spike Recovery for BTX Average: 77%

Jaime Chow
Laboratory Director

Precision Analytical Laboratory, Inc.
4136 LAKESIDE DRIVE, RICHMOND, CA 94806 PHONE (415) 222-3002 FAX (415) 222-1251

Anania Geological Engineering
Job No. 70748

Lab ID	Client ID	Benzene	Toluene	MDL
70748-9	3965 MW-5 6'	<0.03	0.04	0.03
70748-10	3966 MW-5 10'	<0.03	0.045	0.03
70748-11	3969 MW-13 6'	<0.03	0.035	0.03
70748-12	3970 MW-13 9'	<0.03	0.036	0.03
70748-13	3973 MW-16 6'	<0.03	0.033	0.03
70748-14	3974 MW-16 11'	<0.03	0.033	0.03

Lab ID	Client ID	Ethylbenzene	Xylene	MDL
70748-9	3965 MW-5 6'	<0.03	0.04	0.03
70748-10	3966 MW-5 10'	<0.03	0.045	0.03
70748-11	3969 MW-13 6'	<0.03	0.035	0.03
70748-12	3970 MW-13 9'	<0.03	0.036	0.03
70748-13	3973 MW-16 6'	<0.03	0.04	0.03
70748-14	3974 MW-16 11'	<0.03	0.04	0.03

Clayton Environmental Consultants, Inc.

P.O. Box 9019 • 1252 Quarry Lane • Pleasanton, CA 94566 • (415) 426-2600

RECEIVED MAR 2 8 1989

March 27, 1989

Mr. Karl Anania
ANANIA GEOLOGIC ENGINEERING
11330 Sunrise Park Dr.
Rancho Cordova, CA 95742

Client Ref. No.: 004-88-059
Lab Batch No.: 8903158
Clayton Project No.: 22645.00
Client Code No.: 0636

Dear Mr. Anania:

Attached is our analytical laboratory report for the samples received on March 23, 1989. A copy of the Chain of Custody form acknowledging receipt of these samples is attached. Please note that di-n-butyl phthalate was detected in the method blank but was not detected in the sample extracts, therefore, no correction has been applied to the samples.

Please note that any unused portion of the samples will be retained at our facility for approximately 30 days after the date of this report, unless you have requested otherwise.

We appreciate the opportunity to be of assistance to you. If you have any questions, please call Maryann Gambino, Client Services Representative, at (415) 426-2657.

Sincerely,

Ronald H. Peters, CIH
Manager, Laboratory Services

RHP/mn
Attachment

EPA METHOD 8240
PURGEABLE ORGANICS
(LOW-LEVEL METHOD)

Sample I.D.:	✓3833 MW-3-9'	Client:	ANANIA GEOLOGIC ENG.
Sample Received:	03/23/89	Client Ref. No.:	004-88-059
Sample Analyzed:	03/23/89	Lab Client Code:	0636
Sample Matrix:	Soil	Lab No.:	8903158-01

Compound	Concentration µg/kg (ppb)	Limit of Detection µg/kg (ppb)
Chloromethane	ND	10
Bromomethane	ND	4
Vinyl chloride	ND	4
Chloroethane	ND	4
Methylene chloride	ND	10
Trichlorofluoromethane	ND	3
1,1-dichloroethene	ND	3
1,1-dichloroethane	ND	3
Trans-1,2-dichloroethene	ND	3
Chloroform	ND	3
1,2-dichloroethane	10	3
1,1,1-trichloroethane	ND	3
Carbon tetrachloride	ND	3
Bromodichloromethane	ND	3
1,2-dichloropropane	ND	3
Cis-1,3-dichloropropene	ND	3
Trichloroethene	ND	4
Benzene	76	2
Dibromochloromethane	ND	2
1,1,2-trichloroethane	ND	3
Trans-1,3-dichloropropene	ND	5
2-chloroethylvinylether	ND	3
Bromoform	ND	3
1,1,2,2-tetrachloroethane	ND	4
Tetrachloroethene	ND	4
Toluene	16	2
Chlorobenzene	ND	3
Ethylbenzene	4	3
1,3-dichlorobenzene	ND	3
1,2-dichlorobenzene	ND	3
1,4-dichlorobenzene	ND	3
Freon 113	ND	3
Total Xylenes	10	3

ND = Not detected at or above limit of detection.

EPA METHOD 8240
PURGEABLE ORGANICS
(LOW-LEVEL METHOD)

Sample I.D.:	✓3839 MW-2-9 1/2'	Client:	ANANIA GEOLOGIC ENG.
Sample Received:	03/23/89	Client Ref. No.:	004-88-059
Sample Analyzed:	03/23/89	Lab Client Code:	0636
Sample Matrix:	Soil	Lab No.:	8903158-02

Compound	Concentration µg/kg (ppb)	Limit of Detection µg/kg (ppb)
Chloromethane	ND	10
Bromomethane	ND	4
Vinyl chloride	ND	4
Chloroethane	ND	4
Methylene chloride	ND	10
Trichlorofluoromethane	ND	3
1,1-dichloroethene	ND	3
1,1-dichloroethane	ND	3
Trans-1,2-dichloroethene	ND	3
Chloroform	ND	3
1,2-dichloroethane	ND	3
1,1,1-trichloroethane	ND	3
Carbon tetrachloride	ND	3
Bromodichloromethane	ND	3
1,2-dichloropropane	ND	3
Cis-1,3-dichloropropene	ND	3
Trichloroethene	ND	4
Benzene	ND	2
Dibromochloromethane	ND	2
1,1,2-trichloroethane	ND	3
Trans-1,3-dichloropropene	ND	5
2-chloroethylvinylether	ND	3
Bromoform	ND	3
1,1,2,2-tetrachloroethane	ND	4
Tetrachloroethene	ND	4
Toluene	ND	2
Chlorobenzene	ND	3
Ethylbenzene	ND	3
1,3-dichlorobenzene	ND	3
1,2-dichlorobenzene	ND	3
1,4-dichlorobenzene	ND	3
Freon 113	ND	3
Total Xylenes	ND	3

ND = Not detected at or above limit of detection.

EPA METHOD 8240
PURGEABLE ORGANICS
(LOW-LEVEL METHOD)

Sample I.D.:	Method Blank	Client:	ANANIA GEOLOGIC ENG.
Sample Received:		Client Ref. No.:	004-88-059
Sample Analyzed:	03/23/89	Lab Client Code:	0636
Sample Matrix:	Soil	Lab No.:	8903158-MB

Compound	Concentration µg/kg (ppb)	Limit of Detection µg/kg (ppb)
Chloromethane	ND	10
Bromomethane	ND	4
Vinyl chloride	ND	4
Chloroethane	ND	4
Methylene chloride	ND	10
Trichlorofluoromethane	ND	3
1,1-dichloroethene	ND	3
1,1-dichloroethane	ND	3
Trans-1,2-dichloroethene	ND	3
Chloroform	ND	3
1,2-dichloroethane	ND	3
1,1,1-trichloroethane	ND	3
Carbon tetrachloride	ND	3
Bromodichloromethane	ND	3
1,2-dichloropropane	ND	3
Cis-1,3-dichloropropene	ND	3
Trichloroethene	ND	4
Benzene	ND	2
Dibromochloromethane	ND	2
1,1,2-trichloroethane	ND	3
Trans-1,3-dichloropropene	ND	5
2-chloroethylvinylether	ND	3
Bromoform	ND	3
1,1,2,2-tetrachloroethane	ND	4
Tetrachloroethene	ND	4
Toluene	ND	2
Chlorobenzene	ND	3
Ethylbenzene	ND	3
1,3-dichlorobenzene	ND	3
1,2-dichlorobenzene	ND	3
1,4-dichlorobenzene	ND	3
Freon 113	ND	3
Total Xylenes	ND	3

ND = Not detected at or above limit of detection.

EPA METHOD 8270
BASE/NEUTRALS AND ACIDS
(LOW LEVEL METHOD)

Sample I.D.:	3833 MW-3-9'	Client:	ANANIA GEOLOGIG ENG.
Sample Received:	03/23/89	Client Ref. No.:	004-88-059
Sample Analyzed:	03/23/89	Lab Client Code:	0636
Sample Matrix:	Soil	Lab No.:	8903158-01

	Concentration µg/kg (ppb)	Limit of Detection µg/kg (ppb)
ACID COMPOUNDS		
Phenol	100	30
2-chlorophenol	ND	30
2-methyl phenol	ND	30
4-methyl phenol	ND	30
2-nitrophenol	ND	30
2,4-dimethylphenol	ND	30
2,4-dichlorophenol	ND	30
4-chloro-3-methylphenol	ND	30
2,4,5-trichlorophenol	ND	30
2,4,6-trichlorophenol	ND	30
2,4-dinitrophenol	ND	200
4-nitrophenol	ND	200
2-methyl-4,6-dinitrophenol	ND	30
pentachlorophenol	ND	30
BASE/NEUTRAL COMPOUNDS		
N-nitrosodimethylamine	ND	200
Bis(2-chloroethyl)ether	ND	30
1,3-dichlorobenzene	ND	30
1,4-dichlorobenzene	ND	30
1,2-dichlorobenzene	ND	30
Bis-(2-chloroisopropyl)ether	ND	30
N-nitrosodi-n-propylamine	ND	30
Hexachloroethane	ND	30
Nitrobenzene	ND	30
Isophorone	ND	30
Bis-(2-chloroethoxy)methane	ND	30
1,2,4-trichlorobenzene	ND	30
naphthalene	ND	30
hexachlorobutadiene	ND	30
2-chloronaphthalene	ND	30
2- Methyl Napthalene	ND	30

ND = Not detected at or above limit of detection

EPA METHOD 8270
BASE/NEUTRALS AND ACIDS
(LOW LEVEL METHOD)
(Cont.d)

Sample I.D.: 3833 MW-3-9' Client: ANANIA GEOLOGIC ENG.

	Concentration µg/kg (ppb)	Limit of Detection µg/kg (ppb)
BASE/NEUTRAL COMPOUNDS		
4-chloroaniline	ND	200
2-nitroaniline	ND	200
3-nitroaniline	ND	200
4-nitroaniline	ND	200
hexachlorocyclopentadiene	ND	30
dimethyl phthalate	ND	300
acenaphthylene	ND	30
acenaphthene	ND	30
2,4-dinitrotoluene	ND	30
2,6-dinitrotoluene	ND	30
diethyl phthalate	ND	30
4-chlorophenylphenylether	ND	30
fluorene	ND	30
N-nitrosodiphenylamine	ND	30
4-bromophenylphenylether	ND	30
hexachlorobenzene	ND	30
phenanthrene	ND	30
anthracene	ND	30
di-n-butylphthalate	ND	30
fluoranthene	ND	30
benzidine	ND	1000
pyrene	ND	30
benzylbutylphthalate	ND	30
3,3'-dichlorobenzidine	ND	1000
benzo(a)anthracene	ND	30
bis-(2-ethylhexyl)phthalate	ND	300
Chrysene	ND	70
di-n-octylphthalate	ND	30
benzo(b)fluoranthene	ND	70
benzo(k)fluoranthene	ND	30
benzo(a)pyrene	ND	30
indeno(1,2,3-cd)pyrene	ND	30
dibenzo(a,h)anthracene	ND	30
benzo(ghi)perylene	ND	30

ND = Not detected at or above limit of detection

EPA METHOD 8270
BASE/NEUTRALS AND ACIDS
(LOW LEVEL METHOD)

Sample I.D.:	√3839 MW-2-9 1/2'	Client:	ANANIA GEOLOGIG ENG.
Sample Received:	03/23/89	Client Ref. No.:	004-88-059
Sample Analyzed:	03/24/89	Lab Client Code:	0636
Sample Matrix:	Soil	Lab No.:	8903158-02

	Concentration µg/kg (ppb)	Limit of Detection µg/kg (ppb)
ACID COMPOUNDS		
Phenol	ND	30
2-chlorophenol	ND	30
2-methyl phenol	ND	30
4-methyl phenol	ND	30
2-nitrophenol	ND	30
2,4-dimethylphenol	ND	30
2,4-dichlorophenol	ND	30
4-chloro-3-methylphenol	ND	30
2,4,5-trichlorophenol	ND	30
2,4,6-trichlorophenol	ND	30
2,4-dinitrophenol	ND	200
4-nitrophenol	ND	200
2-methyl-4,6-dinitrophenol	ND	30
pentachlorophenol	ND	30
BASE/NEUTRAL COMPOUNDS		
N-nitrosodimethylamine	ND	200
Bis(2-chloroethyl)ether	ND	30
1,3-dichlorobenzene	ND	30
1,4-dichlorobenzene	ND	30
1,2-dichlorobenzene	ND	30
Bis-(2-chloroisopropyl)ether	ND	30
N-nitrosodi-n-propylamine	ND	30
Hexachloroethane	ND	30
Nitrobenzene	ND	30
Isophorone	ND	30
Bis-(2-chloroethoxy)methane	ND	30
1,2,4-trichlorobenzene	ND	30
naphthalene	ND	30
hexachlorobutadiene	ND	30
2-chloronaphthalene	ND	30
2- Methyl Napthalene	ND	30

ND = Not detected at or above limit of detection

EPA METHOD 8270
BASE/NEUTRALS AND ACIDS
(LOW LEVEL METHOD)
(Cont.d)

Sample I.D.: (3833) MW-2-9 1/2' Client: ANANIA GEOLOGIC ENG.

	Concentration µg/kg (ppb)	Limit of Detection µg/kg (ppb)
BASE/NEUTRAL COMPOUNDS		
4-chloroaniline	ND	200
2-nitroaniline	ND	200
3-nitroaniline	ND	200
4-nitroaniline	ND	200
hexachlorocyclopentadiene	ND	30
dimethyl phthalate	ND	300
acenaphthylene	ND	30
acenaphthene	ND	30
2,4-dinitrotoluene	ND	30
2,6-dinitrotoluene	ND	30
diethyl phthalate	ND	30
4-chlorophenylphenylether	ND	30
fluorene	ND	30
N-nitrosodiphenylamine	ND	30
4-bromophenylphenylether	ND	30
hexachlorobenzene	ND	30
phenanthrene	ND	30
anthracene	ND	30
di-n-butylphthalate	ND	30
fluoranthene	ND	30
benzidine	ND	1000
pyrene	ND	30
benzylbutylphthalate	ND	30
3,3'-dichlorobenzidine	ND	1000
benzo(a)anthracene	ND	30
bis-(2-ethylhexyl)phthalate	ND	300
Chrysene	ND	70
di-n-octylphthalate	ND	30
benzo(b)fluoranthene	ND	70
benzo(k)fluoranthene	ND	30
benzo(a)pyrene	ND	30
indeno(1,2,3-cd)pyrene	ND	30
dibenzo(a,h)anthracene	ND	30
benzo(ghi)perylene	ND	30

ND = Not detected at or above limit of detection

EPA METHOD 8270
BASE/NEUTRALS AND ACIDS
(LOW LEVEL METHOD)

Sample I.D.:	Method Blank	Client:	ANANIA GEOLOGIG ENG.
Sample Received:		Client Ref. No.:	004-88-059
Sample Analyzed:	03/24/89	Lab Client Code:	0636
Sample Matrix:	Soil	Lab No.:	8903158-MB

	Concentration µg/kg (ppb)	Limit of Detection µg/kg (ppb)
ACID COMPOUNDS		
Phenol	ND	30
2-chlorophenol	ND	30
2-methyl phenol	ND	30
4-methyl phenol	ND	30
2-nitrophenol	ND	30
2,4-dimethylphenol	ND	30
2,4-dichlorophenol	ND	30
4-chloro-3-methylphenol	ND	30
2,4,5-trichlorophenol	ND	30
2,4,6-trichlorophenol	ND	30
2,4-dinitrophenol	ND	200
4-nitrophenol	ND	200
2-methyl-4,6-dinitrophenol	ND	30
pentachlorophenol	ND	30
BASE/NEUTRAL COMPOUNDS		
N-nitrosodimethylamine	ND	200
Bis(2-chloroethyl)ether	ND	30
1,3-dichlorobenzene	ND	30
1,4-dichlorobenzene	ND	30
1,2-dichlorobenzene	ND	30
Bis-(2-chloroisopropyl)ether	ND	30
N-nitrosodi-n-propylamine	ND	30
Hexachloroethane	ND	30
Nitrobenzene	ND	30
Isophorone	ND	30
Bis-(2-chloroethoxy)methane	ND	30
1,2,4-trichlorobenzene	ND	30
naphthalene	ND	30
hexachlorobutadiene	ND	30
2-chloronaphthalene	ND	30
2- Methyl Napthalene	ND	30

ND = Not detected at or above limit of detection

EPA METHOD 8270
BASE/NEUTRALS AND ACIDS
(LOW LEVEL METHOD)
(Cont.d)

Sample I.D.: Method Blank Client: ANANIA GEOLOGIC ENG.

	Concentration µg/kg (ppb)	Limit of Detection µg/kg (ppb)
BASE/NEUTRAL COMPOUNDS		
4-chloroaniline	ND	200
2-nitroaniline	ND	200
3-nitroaniline	ND	200
4-nitroaniline	ND	200
hexachlorocyclopentadiene	ND	30
dimethyl phthalate	ND	300
acenaphthylene	ND	30
acenaphthene	ND	30
2,4-dinitrotoluene	ND	30
2,6-dinitrotoluene	ND	30
diethyl phthalate	ND	30
4-chlorophenylphenylether	ND	30
fluorene	ND	30
N-nitrosodiphenylamine	ND	30
4-bromophenylphenylether	ND	30
hexachlorobenzene	ND	30
phenanthrene	ND	30
anthracene	ND	30
di-n-butylphthalate	1200	30
fluoranthene	ND	30
benzidine	ND	1000
pyrene	ND	30
benzylbutylphthalate	ND	30
3,3'-dichlorobenzidine	ND	1000
benzo(a)anthracene	ND	30
bis-(2-ethylhexyl)phthalate	ND	300
Chrysene	ND	70
di-n-octylphthalate	ND	30
benzo(b)fluoranthene	ND	70
benzo(k)fluoranthene	ND	30
benzo(a)pyrene	ND	30
indeno(1,2,3-cd)pyrene	ND	30
dibenzo(a,h)anthracene	ND	30
benzo(ghi)perylene	ND	30

ND = Not detected at or above limit of detection

CHAIN OF CUSTODY RECORD

8003158

PROJ. NO. [redacted] SAMPLERS: (Signature) [redacted]

CC4-88-059

PROJECT NAME AND ADDRESS:
ANANIA ~~Geog~~ Geologic Engineering
MARY SCHAGG 1133 C. Sunrise Park Drive
Rancho Cordova, Ca - 95742 (916) 451-9554

ANALYSIS REQUESTED

CROSS REFERENCE NUMBER	DATE	TIME	SOIL	WATER	~~STATION LOCATION~~ Simple ID	TOTAL PETROLEUM HYDROCARBONS	BTX	VOC-EPA 8240	TOTAL OIL & GREASE	5520	8270	REMARKS
	3/21/89	2:40	X		3833 MW-3 - 4'					X	X	
	3/22/89	9:15	X		3837 MW-2 4½'					X	X	

RELINQUISHED BY: (Signature)	DATE / TIME	RECEIVED BY: (Signature)	DATE / TIME
[redacted]	3/22/89 1:20		
RELINQUISHED BY: (Signature)	DATE / TIME	RECEIVED BY: (Signature)	DATE / TIME
RELINQUISHED BY: (Signature)	DATE / TIME	RECEIVED BY: (Signature)	DATE / TIME
RELINQUISHED BY: (Signature)	DATE / TIME	RECEIVED FOR LABORATORY BY: (Signature) Tracy M Burkett	DATE 3/23/89 TIME 2:45 PM

Rush by Monday

ANANIA GEOLOGIC ENGINEERING

AGE No. 1064

PROJECT NO.	LAB REPORT NO.
C04-88-057	
P.O. NO.	SAMPLERS: (signature)
	Eric J. Anania

LAB LOG NO.	DATE	TIME	SAMPLE I.D.	NO. OF CONTAINERS	SAMPLE TYPE: SOIL COMP	SOIL GRAB	WATER	ANALYSES: BTEX 8020	TPH-Gasoline M8015	Total Lead					REMARKS
	3/14/89	10:05	3649	1		X		X	X	X					
	3/15/89	10 3	3650	1		X		X	X	X					

RELINQUISHED BY: (signature)	DATE/TIME	RECEIVED BY: (signature)
Eric J. Anania	3/15/89 2:50	Jack Sandlatter
RELINQUISHED BY: (signature)	DATE/TIME	RECEIVED BY: (signature)
Jack Sandlatter	3/15/89 3:15	Donna Gillispie
RELINQUISHED BY: (signature)	DATE/TIME	RECEIVED BY: (signature)

REMARKS:

SEND RESULTS TO:

ATTN: AGE
11330 Sunrise Park Dr. #C
Rancho Cordova CA 95742

PHONE NO. (916) ~~451-0821~~

G5100154

CHAIN OF CUSTODY

White- AGE Yellow – LAB Copy Pink- File

ANANIA GEOLOGIC ENGINEERING

AGE

PROJECT NO.	LAB REPORT NO.	P.O. NO.	SAMPLERS: (signature)
004-88-059			[signature]

LAB LOG NO.	DATE	TIME	SAMPLE I.D.	NO. OF CONTAINERS	SOIL COMP	SOIL GRAB	WATER	TPH gas/diesel	BTXE	Total Pb	8240	8270	Oil + grease		REMARKS
	3/16	13.30	3153/MW7	1		X		X	X	X					
	3/16	13.40	3154/MW7	1		X		X	X	X					
	3/16	14.05	3155/MW7	1		X		X	X	X	X	X	+		
	3/16	14.15	3156/MW7	1		X		X	X	X					
			~~3157~~	~~1~~											
			~~3~~												

RELINQUISHED BY: (signature)	DATE/TIME	RECEIVED BY: (signature)
[signature]	3/17 1115	Mary Scruggs
Mary Scruggs	3/17 3.30	[signature]

REMARKS: Rush Turnaround

SEND RESULTS TO: AGE
ATTN: Mary Scruggs
11130 Sunrise Park Dr Suite C
Rancho Cordova, CA 95742
PHONE NO. (916) ~~451-0921~~ 631-0157

CHAIN OF CUSTODY

White- AGE Yellow- LAB Copy Pink- File

ANANIA GEOLOGIC ENGINEERING

AGE

PROJECT NO. C04-88-059

LAB REPORT NO.

P.O. NO.

SAMPLERS: (signature) [signature]

LAB LOG NO.	DATE	TIME	SAMPLE I.D.	NO. OF CONTAINERS	SAMPLE TYPE SOIL COMP	SOIL GRAB	WATER	TTLC Total Lead	TPH gas & diesel Mod. 8015	BTEX 8010	Fat oil & grease 503 D&E				REMARKS
	3/16/89	12:30	3657 MW-10	1		X		X	X	X					
	3/16/89	1:00	3658 MW-10	1		X		X	X	X					
	3/17/89	7:38	3661 MW-9	1		X		X	X	X					
	3/17/89	8:00	3662 MW-9	1		X		X	X	X	X				
	3/17/89	12:25	3663 MW-1	1			X	X							
	3/17/89	12:45	3664 MW-10	1			X	X							
	3/17	5:00	3149 MW 14	1		X		X	X	X					
	7/17	8:10	3150 MW 14	1		X		X	X	X					
	3/17	8:25	3151 MW 14	1		X		X	X	X					
	3/17	5:00	3152 MW 14	1		X		X	X	X					
	3/17	10:30	3157 MW 15	1		X		X	X	X					
	3/17	11:00	3159 MW 15	1		X		X	X	X					
	3/17	11:15	3160 MW 15	1		X		X	X	X					

RELINQUISHED BY: (signature)	DATE/TIME	RECEIVED BY: (signature)
[signature]	3/17/89 1:15	Mary Scruggs
Mary Scruggs	3/17/89 3:30	[signature]

REMARKS: Rush Turnaround

SEND RESULTS TO: AGE
ATTN: Mary Scruggs
11130 Sunrise Park Dr Suite C
Rancho Cordova, CA 95742
PHONE NO. (916) ~~451-0021~~ 631-0154

CHAIN OF CUSTODY

White- AGE Yellow—LAB Copy Pink- File

ANANIA GEOLOGIC ENGINEERING

AGE № 1009

PROJECT NO.	LAB REPORT NO.	P.O. NO.	SAMPLERS: (signature)
004-88-059			[signature]

LAB LOG NO.	DATE	TIME	SAMPLE I.D.	NO. OF CONTAINERS	SAMPLE TYPE: SOIL COMP	SAMPLE TYPE: SOIL GRAB	SAMPLE TYPE: WATER	ANALYSES: TPH gasoline/diesel	Oil & grease 503D	BTEX	Total Pb	8240	8270		REMARKS
	3/17	14:05	3164 MW6			X		X	X	X	X	X	X		
	3/17	14:10	3165 MW6			X		X	X	X	X	X	X		
	3/17	14:20	3166 MW6			X		X	X	X					

RELINQUISHED BY: (signature)	DATE/TIME	RECEIVED BY: (signature)
[signature]	3/17/1700	[signature]
[signature]	3/18/89/1155	[signature]

REMARKS:

SEND RESULTS TO:

ATTN:

PHONE NO. (916) 451-0921

CHAIN OF CUSTODY

White- AGE Yellow- LAB Copy Pink- File

8903126

ANANIA GEOLOGIC ENGINEERING

PAGE No 1009

PROJECT NO.	LAB REPORT NO.
004-88-059	
P.O. NO.	SAMPLERS: (signature)

LAB LOC NO.	DATE	TIME	SAMPLE I.D.	NO. OF CON-TAINERS	SAMPLE TYPE: SOIL COMP	SOIL GRAB	WATER	TPH gasoline & diesel	Oil & grease 503 D&E	BTEX	Total Pb	8240	8270			REMARKS
			3164 MW6					X	X	X	X	X	X			
			3165 MW6					X	X	X	X	X	X			
			3166 MW6					X	X	X						

RELINQUISHED BY: (signature)	DATE/TIME	RECEIVED BY: (signature)
	3/17/1700	
RELINQUISHED BY: (signature)	DATE/TIME	RECEIVED BY: (signature)
	3/18/89/15	
RELINQUISHED BY: (signature)	DATE/TIME	RECEIVED BY: (signature)
	3-20-89 2:00pm	

REMARKS: 3 day turn

SEND RESULTS TO:
ATTN: Tom Edwards

ANANIA GEOLOGIC ENGINEERING

AGE № 1014

PROJECT NO. CC4-88-059

LAB REPORT NO.

P.O. NO.

SAMPLERS: (signature) Eric J. [illegible]

LAB LOG NO.	DATE	TIME	SAMPLE I.D.	NO. OF CONTAINERS	SAMPLE TYPE: SOIL COMP	SOIL GRAB	WATER	ANALYSES: TPH [illegible] gas & diesel	BTEX [illegible]	Fat oil / grease	TTLC Lead				REMARKS
	3/24/89	9:45	36[illegible]81 mw-4 4'	1		1		X	X		X				
	3/24/89	10:00	36[illegible]82 mw-4 9.5'	1		1		X	X	X	X				
	3/17/89	2:05	3161 mw-8 4.5'	1		1		X	X		X				
	3/17/89	2:15	3162 mw-8 9.5'	1		1		X	X	X	X				
	3/17/89	2:40	3163 mw-8 16.5'	1		1		X	X		X				

RELINQUISHED BY: (signature)	DATE/TIME	RECEIVED BY: (signature)
Eric J. [illegible]	3/24/89 8:30	Joe R. [illegible]
Joe R. [illegible]	3/21/89 9:00	Rajdevinder Pandher

REMARKS:

SEND RESULTS TO:

ATTN: Mary Scruggs

PHONE NO. (916) ~~451-0921~~ 631-0054

CHAIN OF CUSTODY

White-AGE   Yellow-LAB Copy   Pink-File

ANANIA GEOLOGIC ENGINEERING

AGE

PROJECT NO.	LAB REPORT NO.
004-88-059	
P.O. NO.	SAMPLERS: (signature) Eric J. Ahl

LAB LOG NO.	DATE	TIME	SAMPLE I.D.	NO. OF CONTAINERS	SAMPLE TYPE: SOIL COMP	SOIL GRAB	WATER	TPH M 8015 Gas & diesel	BTEX 8020	TTLC Lead	Oil & Grease 503 D&G	8240	8270	Fuel oil T Crude	REMARKS
	3/21/89	8:30	3671 MW-11 5'	1		X		X	X	X					
	3/21/89	9:10	3672 MW-11 9'	1		X		X	X	X				X	
	3/21/89	11:20	3679 MW-12 4'	1		X		X	X	X					
	3/21/89	11:25	3680 MW-12 9'	1		X		X	X	X				X	
	3/21/89	2:30	3829 MW-3 4'	1		X		X	X	X					
	3/21/89	2:40	3833 MW-3 9'	1		X		X	X	X	X	X	X	X	
	3/22/89	8:50	3838 MW-2 4½'	1		X		X	X	X					
	3/22/89	9:15	3839 MW-2 9½'	1		X		X	X	X	X	X	X	X	

RELINQUISHED BY: (signature)	DATE/TIME	RECEIVED BY: (signature)
Eric J. Ahl	3/23 1200	
RELINQUISHED BY: (signature)	DATE/TIME	RECEIVED BY: (signature)
RELINQUISHED BY: (signature)	DATE/TIME	RECEIVED BY: (signature)

REMARKS:
8240 & 8270 Analysis to be set out
Rush 24 hour

SEND RESULTS TO:
ATTN: Mary Scruggs
AGE
11330 Sunrise Park Suite C
Rancho Cordova, 95742
PHONE NO. (916) ~~451-0921~~

CHAIN OF CUSTODY

White- AGE Yellow – LAB Copy Pink- File

631-0154

CHAIN OF CUSTODY RECORD 8903159

PROJ. NO. [redacted] SAMPLERS: (Signature) [redacted]

PROJECT NAME AND ADDRESS:
ANANIA Geologic Engineering
MARY SCHUG 11330 Sunrise Park Drive
Rancho Cordova, CA 95742 (916) 451-9574

CROSS REFERENCE NUMBER	DATE	TIME	SOIL	WATER	SAMPLE ID / STATION LOCATION	TOTAL PETROLEUM HYDROCARBONS	BTX	VOC-EPA 8240	TOTAL OIL & GREASE	5520	5370	REMARKS
	3/21/89	2:40	X		35.55 MW-3 - 4'					X	X	
	3/22/89	9.15	/		35.37 MW-2 4½'					X	X	

RELINQUISHED BY: (Signature)	DATE / TIME	RECEIVED BY: (Signature)	DATE / TIME
[signature]	DATE 3/22/89 TIME 3:20		
RELINQUISHED BY: (Signature)	DATE / TIME	RECEIVED BY: (Signature)	DATE / TIME
RELINQUISHED BY: (Signature)	DATE / TIME	RECEIVED BY: (Signature)	DATE / TIME
RELINQUISHED BY: (Signature)	DATE / TIME	RECEIVED FOR LABORATORY BY: (Signature) Tracy McBride	DATE 3/23/89 TIME 2:45 PM

Rush by Monday

ANANIA GEOLOGIC ENGINEERING

AGE № 1015

PROJECT NO.	LAB REPORT NO.
007-88-059	

P.O. NO.	SAMPLERS: (signature)
	Karl J Anania

LAB LOG NO.	DATE	TIME	SAMPLE I.D.	NO. OF CONTAINERS	SAMPLE TYPE: SOIL COMP	SOIL GRAB	WATER	ANALYSES: Total Pb	GC/FID TPH 8015 diesel	BTEX	Fuel Gradient				REMARKS
	3-21-88	8:20	MW-5 @ 6' 3965	1		X		X	X	X	X				
	3-21	09:05	MW-5 @ 10' 3966	1		X		X	X	X	X				
	3-21	13:30	MW-13 @ 6' 3969	1		X		X	X	X	X				
	3-21	13:50	MW-13 @ 9' 3970	1		X		X	X	X	X				
	3-22	14:30	MW-16 @ 6' 3973	1		X		X	X	X	X				
	3-22	15:20	MW-16 @ 11' 3974	1		X		X	X	X	X				
	3-22	16:00	Comp. MW-7, MW-8, & PR-30, # 3175	1			GAS	X							Gasoline Sample

RELINQUISHED BY: (signature)	DATE/TIME	RECEIVED BY: (signature)
Karl J Anania	3/23 12:00	
RELINQUISHED BY: (signature)	DATE/TIME	RECEIVED BY: (signature)
RELINQUISHED BY: (signature)	DATE/TIME	RECEIVED BY: (signature)

REMARKS:

24 hour

RWL

SEND RESULTS TO: AGE Mary Scruggs

ATTN: [redacted] Eric Hukm Suite C

11330 Sunrise Park Dr

Rancho Cordova, CA 95742

PHONE NO. (916) 451-0921

CHAIN OF CUSTODY

White- AGE Yellow – LAB Copy Pink- File

APPENDIX D

Analytical Results For Groundwater Samples

Chain Of Custody Forms For Groundwater Samples

Precision Analytical Laboratory, Inc.

4136 LAKESIDE DRIVE, RICHMOND, CA 94806 PHONE (415) 222-3002 FAX (415) 222-1251

CERTIFICATE OF ANALYSIS

State License No. 211

Received: 03/24/89
Reported: 03/28/89
Job No #: 70757

Attn: Mary Scruggs
Anania Geological Engineering
11330 Sunrise Park Drive, Suite C
Rancho Cordova, CA. 95742

Project: #004-88-059

Total Petroleum Hydrocarbon Analysis:
By EPA 5030 & DHS Extraction Method
Oil & Grease Analysis: By Standard Method 503D
Total Lead: By EPA 6010
mg/l

Lab ID	Client ID	Diesel	Gasoline	Oil & Grease	Total Lead
70757-1	3841 MW-9	ND<0.5	ND<0.5	<50	ND<0.044
70757-2	3845 MW-10	ND<0.5	ND<0.5	<50	ND<0.044
70757-3	3853 MW-11	ND<0.5	ND<0.5	<50	ND<0.044
70757-4	3850 MW-12	ND<0.5	ND<0.5	<50	ND<0.044
70757-5	3857 MW-13	ND<0.5	ND<0.5	<50	ND<0.044

QA/QC: Spike Recovery for Diesel: 110%
Spike Recovery for Oil & Grease: 103%
Spike Recovery for Lead: 73%

Detection Limit for Diesel: 0.5
Detection Limit for Oil & Grease: 50
Detection Limit for Lead: 0.044

Jaime Chow
Laboratory Director

Precision Analytical Laboratory, Inc.

4136 LAKESIDE DRIVE, RICHMOND, CA 94806 PHONE (415) 222-3002 FAX (415) 222-1251

CERTIFICATE OF ANALYSIS

State License No. 211

Received: 03/24/89
Reported: 03/28/89
Job No #: 70757

Attn: Mary Scruggs
Anania Geological Engineering
11330 Sunrise Park Drive, Suite C
Rancho Cordova, CA. 95742

Project: #004-88-059

Aromatic Volatile Hydrocarbon Analysis:
EPA Method 8020
ug/l

Lab ID	Client ID	Benzene	Toluene	MDL
70757-1	3841 MW-9	<0.3	<0.3	0.3
70757-2	3845 MW-10	<0.3	<0.3	0.3
70757-3	3853 MW-11	<0.3	<0.3	0.3
70757-4	3850 MW-12	<0.3	<0.3	0.3
70757-5	3857 MW-13	<0.3	<0.3	0.3

Lab ID	Client ID	Ethylbenzene	Xylene	MDL
70757-1	3841 MW-9	<0.3	<0.3	0.3
70757-2	3845 MW-10	<0.3	<0.3	0.3
70757-3	3853 MW-11	<0.3	<0.3	0.3
70757-4	3850 MW-12	<0.3	<0.3	0.3
70757-5	3857 MW-13	<0.3	<0.3	0.3

Jaime Chow
Laboratory Director

Clayton Environmental Consultants, Inc.

P.O. Box 9019 • 1252 Quarry Lane • Pleasanton, CA 94566 • (415) 426-2600

March 30, 1989

Mr. Karl Anania
ANANIA GEOLOGIC ENGINEERING
11330 Sunrise Drive
Rancho Cordova, CA 95742

Client Ref. No.: 004-88-059
Lab Batch No.: 8903172
Clayton Project No.: 22669.00
Client Code No.: 0636

Dear Mr. Anania:

Attached is our analytical laboratory report for the samples received on March 27, 1989. A copy of the Chain of Custody form acknowledging receipt of these samples is attached.

Please note that any unused portion of the samples will be retained at our facility for approximately 30 days after the date of this report, unless you have requested otherwise.

We appreciate the opportunity to be of assistance to you. If you have any questions, please call Maryann Gambino, Client Services Representative at (415) 426-2657.

Sincerely,

Ronald H. Peters, CIH
Manager, Laboratory Services

RHP/pf
Attachment

EPA METHOD 8240
PURGEABLE ORGANICS

Sample I.D.:	3845	Client:	ANANIA GEOLOGIC ENG.
Sample Received:	03/27/89	Client Ref. No.:	004-88-059
Sample Analyzed:	03/27/89	Lab Client Code:	0636
Sample Matrix:	Water	Lab No.:	8903172-01

Compound	Concentration µg/L (ppb)	Limit of Detection µg/L (ppb)
Chloromethane	ND	10
Bromomethane	ND	4
Vinyl chloride	ND	4
Chloroethane	ND	4
Methylene chloride	ND	10
Trichlorofluoromethane	ND	3
1,1-dichloroethene	ND	3
1,1-dichloroethane	ND	3
Trans-1,2-dichloroethene	ND	3
Chloroform	ND	3
1,2-dichloroethane	ND	3
1,1,1-trichloroethane	ND	3
Carbon tetrachloride	ND	3
Bromodichloromethane	ND	3
1,2-dichloropropane	ND	3
Cis-1,3-dichloropropene	ND	3
Trichloroethene	ND	4
Benzene	ND	2
Dibromochloromethane	ND	2
1,1,2-trichloroethane	ND	3
Trans-1,3-dichloropropene	ND	5
2-chloroethylvinylether	ND	3
Bromoform	ND	3
1,1,2,2-tetrachloroethane	ND	4
Tetrachloroethene	ND	4
Toluene	ND	2
Chlorobenzene	ND	3
Ethylbenzene	ND	3
1,3-dichlorobenzene	ND	3
1,2-dichlorobenzene	ND	3
1,4-dichlorobenzene	ND	3
Freon 113	ND	3
Total Xylenes	ND	3

ND = Not detected at or above limit of detection.

RECEIVED Apr 3 1989

EPA METHOD 8240
PURGEABLE ORGANICS

Sample I.D.:	3857	Client:	ANANIA GEOLOGIC ENG.
Sample Received:	03/27/89	Client Ref. No.:	004-88-059
Sample Analyzed:	03/27/89	Lab Client Code:	0636
Sample Matrix:	Water	Lab No.:	8903172-02

Compound	Concentration µg/L (ppb)	Limit of Detection µg/L (ppb)
Chloromethane	ND	10
Bromomethane	ND	4
Vinyl chloride	ND	4
Chloroethane	ND	4
Methylene chloride	ND	10
Trichlorofluoromethane	ND	3
1,1-dichloroethene	ND	3
1,1-dichloroethane	ND	3
Trans-1,2-dichloroethene	ND	3
Chloroform	ND	3
1,2-dichloroethane	ND	3
1,1,1-trichloroethane	ND	3
Carbon tetrachloride	ND	3
Bromodichloromethane	ND	3
1,2-dichloropropane	ND	3
Cis-1,3-dichloropropene	ND	3
Trichloroethene	ND	4
Benzene	ND	2
Dibromochloromethane	ND	2
1,1,2-trichloroethane	ND	3
Trans-1,3-dichloropropene	ND	5
2-chloroethylvinylether	ND	3
Bromoform	ND	3
1,1,2,2-tetrachloroethane	ND	4
Tetrachloroethene	ND	4
Toluene	ND	2
Chlorobenzene	ND	3
Ethylbenzene	ND	3
1,3-dichlorobenzene	ND	3
1,2-dichlorobenzene	ND	3
1,4-dichlorobenzene	ND	3
Freon 113	ND	3
Total Xylenes	ND	3

ND = Not detected at or above limit of detection.

EPA METHOD 8240
PURGEABLE ORGANICS

Sample I.D.:	Method Blank	Client:	ANANIA GEOLOGIC ENG.
Sample Received:		Client Ref. No.:	004-88-059
Sample Analyzed:	03/27/89	Lab Client Code:	0636
Sample Matrix:	Water	Lab No.:	8903172-MB

Compound	Concentration µg/L (ppb)	Limit of Detection µg/L (ppb)
Chloromethane	ND	10
Bromomethane	ND	4
Vinyl chloride	ND	4
Chloroethane	ND	4
Methylene chloride	ND	10
Trichlorofluoromethane	ND	3
1,1-dichloroethene	ND	3
1,1-dichloroethane	ND	3
Trans-1,2-dichloroethene	ND	3
Chloroform	ND	3
1,2-dichloroethane	ND	3
1,1,1-trichloroethane	ND	3
Carbon tetrachloride	ND	3
Bromodichloromethane	ND	3
1,2-dichloropropane	ND	3
Cis-1,3-dichloropropene	ND	3
Trichloroethene	ND	4
Benzene	ND	2
Dibromochloromethane	ND	2
1,1,2-trichloroethane	ND	3
Trans-1,3-dichloropropene	ND	5
2-chloroethylvinylether	ND	3
Bromoform	ND	3
1,1,2,2-tetrachloroethane	ND	4
Tetrachloroethene	ND	4
Toluene	ND	2
Chlorobenzene	ND	3
Ethylbenzene	ND	3
1,3-dichlorobenzene	ND	3
1,2-dichlorobenzene	ND	3
1,4-dichlorobenzene	ND	3
Freon 113	ND	3
Total Xylenes	ND	3

ND = Not detected at or above limit of detection.

EPA METHOD 8270
BASE/NEUTRALS AND ACIDS

Sample I.D.:	3845	Client:	ANANIA GEOLOGIC ENG.
Sample Received:	03/27/89	Client Ref. No.:	004-88-059
Sample Analyzed:	03/28/89	Lab Client Code:	0636
Sample Matrix:	Water	Lab No.:	8903172-01

	Concentration µg/L (ppb)	Limit of Detection µg/L (ppb)
ACID COMPOUNDS		
Phenol	ND	1
2-chlorophenol	ND	1
2-methyl phenol	ND	1
4-methyl phenol	ND	1
2-nitrophenol	ND	1
2,4-dimethylphenol	ND	1
2,4-dichlorophenol	ND	1
4-chloro-3-methylphenol	ND	1
2,4,5-trichlorophenol	ND	1
2,4,6-trichlorophenol	ND	1
2,4-dinitrophenol	ND	5
4-nitrophenol	ND	5
2-methyl-4,6-dinitrophenol	ND	1
pentachlorophenol	ND	1
BASE/NEUTRAL COMPOUNDS		
N-nitrosodimethylamine	ND	5
Bis(2-chloroethyl)ether	ND	1
1,3-dichlorobenzene	ND	1
1,4-dichlorobenzene	ND	1
1,2-dichlorobenzene	ND	1
Bis-(2-chloroisopropyl)ether	ND	1
N-nitrosodi-n-propylamine	ND	1
Hexachloroethane	ND	1
Nitrobenzene	ND	1
Isophorone	ND	1
Bis-(2-chloroethoxy)methane	ND	1
1,2,4-trichlorobenzene	ND	1
naphthalene	ND	1
hexachlorobutadiene	ND	1
2-chloronaphthalene	ND	1
2- Methyl Napthalene	ND	1

ND = Not detected at or above limit of detection

EPA METHOD 8270
BASE/NEUTRALS AND ACIDS
(Cont.d)

Sample I.D.: 3845 Client: ANANIA GEOLOGIC ENG.

	Concentration µg/L (ppb)	Limit of Detection µg/L (ppb)
BASE/NEUTRAL COMPOUNDS		
4-chloroaniline	ND	5
2-nitroaniline	ND	5
3-nitroaniline	ND	5
4-nitroaniline	ND	5
hexachlorocyclopentadiene	ND	1
dimethyl phthalate	ND	10
acenaphthylene	ND	1
acenaphthene	ND	1
2,4-dinitrotoluene	ND	1
2,6-dinitrotoluene	ND	1
diethyl phthalate	ND	1
4-chlorophenylphenylether	ND	1
fluorene	ND	1
N-nitrosodiphenylamine	ND	1
4-bromophenylphenylether	ND	1
hexachlorobenzene	ND	1
phenanthrene	ND	1
anthracene	ND	1
di-n-butylphthalate	ND	1
fluoranthene	ND	1
benzidine	ND	30
pyrene	ND	1
benzylbutylphthalate	ND	1
3,3'-dichlorobenzidine	ND	40
benzo(a)anthracene	ND	1
bis-(2-ethylhexyl)phthalate	ND	10
Chrysene	ND	2
di-n-octylphthalate	ND	1
benzo(b)fluoranthene	ND	2
benzo(k)fluoranthene	ND	1
benzo(a)pyrene	ND	1
indeno(1,2,3-cd)pyrene	ND	1
dibenzo(a,h)anthracene	ND	1
benzo(ghi)perylene	ND	1

ND = Not detected at or above limit of detection

EPA METHOD 8270
BASE/NEUTRALS AND ACIDS

Sample I.D.:	3857	Client:	ANANIA GEOLOGIC ENG.
Sample Received:	03/27/89	Client Ref. No.:	004-88-059
Sample Analyzed:	03/28/89	Lab Client Code:	0636
Sample Matrix:	Water	Lab No.:	8903172-02

	Concentration µg/L (ppb)	Limit of Detection µg/L (ppb)
ACID COMPOUNDS		
Phenol	ND	1
2-chlorophenol	ND	1
2-methyl phenol	ND	1
4-methyl phenol	ND	1
2-nitrophenol	ND	1
2,4-dimethylphenol	ND	1
2,4-dichlorophenol	ND	1
4-chloro-3-methylphenol	ND	1
2,4,5-trichlorophenol	ND	1
2,4,6-trichlorophenol	ND	1
2,4-dinitrophenol	ND	5
4-nitrophenol	ND	5
2-methyl-4,6-dinitrophenol	ND	1
pentachlorophenol	ND	1
BASE/NEUTRAL COMPOUNDS		
N-nitrosodimethylamine	ND	5
Bis(2-chloroethyl)ether	ND	1
1,3-dichlorobenzene	ND	1
1,4-dichlorobenzene	ND	1
1,2-dichlorobenzene	ND	1
Bis-(2-chloroisopropyl)ether	ND	1
N-nitrosodi-n-propylamine	ND	1
Hexachloroethane	ND	1
Nitrobenzene	ND	1
Isophorone	ND	1
Bis-(2-chloroethoxy)methane	ND	1
1,2,4-trichlorobenzene	ND	1
naphthalene	ND	1
hexachlorobutadiene	ND	1
2-chloronaphthalene	ND	1
2- Methyl Napthalene	ND	1

ND = Not detected at or above limit of detection

EPA METHOD 8270
BASE/NEUTRALS AND ACIDS
(Cont.d)

Sample I.D.: 3857 Client: ANANIA GEOLOGIC ENG.

	Concentration µg/L (ppb)	Limit of Detection µg/L (ppb)
BASE/NEUTRAL COMPOUNDS		
4-chloroaniline	ND	5
2-nitroaniline	ND	5
3-nitroaniline	ND	5
4-nitroaniline	ND	5
hexachlorocyclopentadiene	ND	1
dimethyl phthalate	ND	10
acenaphthylene	ND	1
acenaphthene	ND	1
2,4-dinitrotoluene	ND	1
2,6-dinitrotoluene	ND	1
diethyl phthalate	ND	1
4-chlorophenylphenylether	ND	1
fluorene	ND	1
N-nitrosodiphenylamine	ND	1
4-bromophenylphenylether	ND	1
hexachlorobenzene	ND	1
phenanthrene	ND	1
anthracene	ND	1
di-n-butylphthalate	ND	1
fluoranthene	ND	1
benzidine	ND	30
pyrene	ND	1
benzylbutylphthalate	ND	1
3,3'-dichlorobenzidine	ND	40
benzo(a)anthracene	ND	1
bis-(2-ethylhexyl)phthalate	ND	10
Chrysene	ND	2
di-n-octylphthalate	ND	1
benzo(b)fluoranthene	ND	2
benzo(k)fluoranthene	ND	1
benzo(a)pyrene	ND	1
indeno(1,2,3-cd)pyrene	ND	1
dibenzo(a,h)anthracene	ND	1
benzo(ghi)perylene	ND	1

ND = Not detected at or above limit of detection

EPA METHOD 8270
BASE/NEUTRALS AND ACIDS

Sample I.D.:	Method Blank	Client:	ANANIA GEOLOGIC ENG.
Sample Received:		Client Ref. No.:	004-88-059
Sample Analyzed:	03/28/89	Lab Client Code:	0636
Sample Matrix:	Water	Lab No.:	8903172-MB

	Concentration µg/L (ppb)	Limit of Detection µg/L (ppb)
ACID COMPOUNDS		
Phenol	ND	1
2-chlorophenol	ND	1
2-methyl phenol	ND	1
4-methyl phenol	ND	1
2-nitrophenol	ND	1
2,4-dimethylphenol	ND	1
2,4-dichlorophenol	ND	1
4-chloro-3-methylphenol	ND	1
2,4,5-trichlorophenol	ND	1
2,4,6-trichlorophenol	ND	1
2,4-dinitrophenol	ND	5
4-nitrophenol	ND	5
2-methyl-4,6-dinitrophenol	ND	1
pentachlorophenol	ND	1
BASE/NEUTRAL COMPOUNDS		
N-nitrosodimethylamine	ND	5
Bis(2-chloroethyl)ether	ND	1
1,3-dichlorobenzene	ND	1
1,4-dichlorobenzene	ND	1
1,2-dichlorobenzene	ND	1
Bis-(2-chloroisopropyl)ether	ND	1
N-nitrosodi-n-propylamine	ND	1
Hexachloroethane	ND	1
Nitrobenzene	ND	1
Isophorone	ND	1
Bis-(2-chloroethoxy)methane	ND	1
1,2,4-trichlorobenzene	ND	1
naphthalene	ND	1
hexachlorobutadiene	ND	1
2-chloronaphthalene	ND	1
2- Methyl Napthalene	ND	1

ND = Not detected at or above limit of detection

EPA METHOD 8270
BASE/NEUTRALS AND ACIDS
(Cont.d)

Sample I.D.: Method Blank Client: ANANIA GEOLOGIC ENG.

	Concentration µg/L (ppb)	Limit of Detection µg/L (ppb)
BASE/NEUTRAL COMPOUNDS		
4-chloroaniline	ND	5
2-nitroaniline	ND	5
3-nitroaniline	ND	5
4-nitroaniline	ND	5
hexachlorocyclopentadiene	ND	1
dimethyl phthalate	ND	10
acenaphthylene	ND	1
acenaphthene	ND	1
2,4-dinitrotoluene	ND	1
2,6-dinitrotoluene	ND	1
diethyl phthalate	ND	1
4-chlorophenylphenylether	ND	1
fluorene	ND	1
N-nitrosodiphenylamine	ND	1
4-bromophenylphenylether	ND	1
hexachlorobenzene	ND	1
phenanthrene	ND	1
anthracene	ND	1
di-n-butylphthalate	ND	1
fluoranthene	ND	1
benzidine	ND	30
pyrene	ND	1
benzylbutylphthalate	ND	1
3,3'-dichlorobenzidine	ND	40
benzo(a)anthracene	ND	1
bis-(2-ethylhexyl)phthalate	ND	10
Chrysene	ND	2
di-n-octylphthalate	ND	1
benzo(b)fluoranthene	ND	2
benzo(k)fluoranthene	ND	1
benzo(a)pyrene	ND	1
indeno(1,2,3-cd)pyrene	ND	1
dibenzo(a,h)anthracene	ND	1
benzo(ghi)perylene	ND	1

ND = Not detected at or above limit of detection

CHAIN OF CUSTODY RECORD

8903172

PROJ. NO. 004/88/059

SAMPLERS: (Signature) Marry Scruggs (916) 631-9554

PROJECT NAME AND ADDRESS:
Angmia Geologic Engineering
11330 Sunrise Dr.
Rancho Cordova - Ca.

72 hrs
3 day's.

CROSS REFERENCE NUMBER	DATE	TIME	SOIL	WATER	STATION LOCATION	TOTAL PETROLEUM HYDROCARBONS	BTEX	VOC-EPA 8240	TOTAL OIL & GREASE	8270 and 8240	REMARKS
3845	3/27/89	12:40		J	3845 mw-10				X		
3857	3/27/89	12:40		J	3857 mw-13				X		

ANALYSIS REQUESTED

RELINQUISHED BY: (Signature)	DATE / TIME	RECEIVED BY: (Signature)	DATE / TIME
Sandra	3/27/89 12:40	Terry Dalco	3-27-89 2:30pm
RELINQUISHED BY: (Signature)	DATE / TIME	RECEIVED BY: (Signature)	DATE / TIME
RELINQUISHED BY: (Signature)	DATE / TIME	RECEIVED BY: (Signature)	DATE / TIME
RELINQUISHED BY: (Signature)	DATE / TIME	RECEIVED FOR LABORATORY BY: (Signature)	DATE / TIME

RECEIVED APR 0 3 1989

Precision Analytical Laboratory, Inc.

4136 LAKESIDE DRIVE, RICHMOND, CA 94806 PHONE (415) 222-3002 FAX (415) 222-1251

CERTIFICATE OF ANALYSIS

State License No. 211

Received: 03/27/89
Reported: 03/29/89
Job No #: 70758

Attn: Mary Scruggs
Anania Geological Engineering
11330 Sunrise Park Drive, Suite C
Rancho Cordova, CA. 95742

Project: #004-88-059

Total Petroleum Hydrocarbon Analysis:
By EPA 5030 & DHS Extraction Method
Total Lead: By EPA 6010
mg/l

Lab ID	Client ID	Diesel	Gasoline	Total Lead
70758-1	3865	ND<0.5	ND<0.5	ND<0.044
70758-2	3869	ND<0.5	ND<0.5	ND<0.044
70758-3	3873	ND<0.5	ND<0.5	ND<0.044
70758-4	3881	ND<0.5	ND<0.5	ND<0.044

QA/QC: Spike Recovery for Diesel: 96%
Spike Recovery for Gasoline: 107%
Spike Recovery for Lead: 77%

Detection Limit for Diesel: 0.5
Detection Limit for Gasoline: 0.5
Detection Limit for Lead: 0.044

Jaime Chow
Laboratory Director

Precision Analytical Laboratory, Inc.

4136 LAKESIDE DRIVE, RICHMOND, CA 94806 PHONE (415) 222-3002 FAX (415) 222-1251

CERTIFICATE OF ANALYSIS

State License No. 211

Received: 03/27/89
Reported: 03/29/89
Job No #: 70758

Attn: Mary Scruggs
Anania Geological Engineering
11330 Sunrise Park Drive, Suite C
Rancho Cordova, CA. 95742

Project: #004-88-059

Aromatic Volatile Hydrocarbon Analysis:
EPA Method 8020
ug/l

Lab ID	Client ID	Benzene	Toluene	MDL
70758-1	3865	<0.3	<0.3	0.3
70758-2	3869	<0.3	<0.3	0.3
70758-3	3873	<0.3	<0.3	0.3
70758-4	3881	<0.3	<0.3	0.3

Lab ID	Client ID	Ethylbenzene	Xylene	MDL
70758-1	3865	<0.3	<0.3	0.3
70758-2	3869	<0.3	<0.3	0.3
70758-3	3873	<0.3	<0.3	0.3
70758-4	3881	<0.3	<0.3	0.3

QA/QC: Spike Recovery Average: 93 %

Jaime Chow
Laboratory Director

Clayton Environmental Consultants, Inc.

P.O. Box 9019 • 1252 Quarry Lane • Pleasanton, CA 94566 • (415) 426-2600

March 31, 1989

Mr. Karl Anania
ANANIA GEOLOGIC ENGINEERING
11330 Sunrise Dr.
Rancho Cordova, CA 95742

Client Ref. No.:
Lab Batch No.: 8903178
Clayton Project No.: 22707.00
Client Code No.: 0636

Dear Mr. Anania:

Attached is our analytical laboratory report for the samples received on March 28, 1989. Verbal results were reported to Mary Scruggs on March 30, 1989. A copy of the Chain of Custody form acknowledging receipt of these samples is attached.

Please note that any unused portion of the samples will be retained at our facility for approximately 30 days after the date of this report, unless you have requested otherwise.

We appreciate the opportunity to be of assistance to you. If you have any questions, please call Maryann Gambino, Client Services Representative, at (415) 426-2657.

Sincerely,

Ronald H. Peters, CIH
Manager, Laboratory Services

RHP/pf
Attachment

EPA METHOD 8240
PURGEABLE ORGANICS

Sample I.D.:	3869 MW-15	**Client:**	ANANIA GEOLOGIC ENG.
Sample Received:	03/28/89	**Client Ref. No.:**	
Sample Analyzed:	03/29/89	**Lab Client Code:**	0636
Sample Matrix:	Water	**Lab No.:**	8903178-01

Compound	Concentration µg/L (ppb)	Limit of Detection µg/L (ppb)
Chloromethane	ND	10
Bromomethane	ND	4
Vinyl chloride	ND	4
Chloroethane	ND	4
Methylene chloride	ND	10
Trichlorofluoromethane	ND	3
1,1-dichloroethene	ND	3
1,1-dichloroethane	ND	3
Trans-1,2-dichloroethene	ND	3
Chloroform	ND	3
1,2-dichloroethane	ND	3
1,1,1-trichloroethane	ND	3
Carbon tetrachloride	ND	3
Bromodichloromethane	ND	3
1,2-dichloropropane	ND	3
Cis-1,3-dichloropropene	ND	3
Trichloroethene	ND	4
Benzene	ND	2
Dibromochloromethane	ND	2
1,1,2-trichloroethane	ND	3
Trans-1,3-dichloropropene	ND	5
2-chloroethylvinylether	ND	3
Bromoform	ND	3
1,1,2,2-tetrachloroethane	ND	4
Tetrachloroethene	ND	4
Toluene	8	2
Chlorobenzene	ND	3
Ethylbenzene	ND	3
1,3-dichlorobenzene	ND	3
1,2-dichlorobenzene	ND	3
1,4-dichlorobenzene	ND	3
Freon 113	ND	3
Total Xylenes	ND	3

ND = Not detected at or above limit of detection.

EPA METHOD 8240
PURGEABLE ORGANICS

Sample I.D.:	3873 MW-16	Client:	ANANIA GEOLOGIC ENG.
Sample Received:	03/28/89	Client Ref. No.:	
Sample Analyzed:	03/29/89	Lab Client Code:	0636
Sample Matrix:	Water	Lab No.:	8903178-02

Compound	Concentration µg/L (ppb)	Limit of Detection µg/L (ppb)
Chloromethane	ND	10
Bromomethane	ND	4
Vinyl chloride	ND	4
Chloroethane	ND	4
Methylene chloride	ND	10
Trichlorofluoromethane	ND	3
1,1-dichloroethene	ND	3
1,1-dichloroethane	ND	3
Trans-1,2-dichloroethene	ND	3
Chloroform	ND	3
1,2-dichloroethane	ND	3
1,1,1-trichloroethane	ND	3
Carbon tetrachloride	ND	3
Bromodichloromethane	ND	3
1,2-dichloropropane	ND	3
Cis-1,3-dichloropropene	ND	3
Trichloroethene	ND	4
Benzene	ND	2
Dibromochloromethane	ND	2
1,1,2-trichloroethane	ND	3
Trans-1,3-dichloropropene	ND	5
2-chloroethylvinylether	ND	3
Bromoform	ND	3
1,1,2,2-tetrachloroethane	ND	4
Tetrachloroethene	ND	4
Toluene	ND	2
Chlorobenzene	ND	3
Ethylbenzene	ND	3
1,3-dichlorobenzene	ND	3
1,2-dichlorobenzene	ND	3
1,4-dichlorobenzene	ND	3
Freon 113	ND	3
Total Xylenes	ND	3

ND = Not detected at or above limit of detection.

EPA METHOD 8240
PURGEABLE ORGANICS

Sample I.D.:	3688 MW-5	Client:	ANANIA GEOLOGIC ENG.
Sample Received:	03/28/89	Client Ref. No.:	
Sample Analyzed:	03/29/89	Lab Client Code:	0636
Sample Matrix:	Water	Lab No.:	8903178-03

Compound	Concentration µg/L (ppb)	Limit of Detection µg/L (ppb)
Chloromethane	ND	10
Bromomethane	ND	4
Vinyl chloride	ND	4
Chloroethane	ND	4
Methylene chloride	ND	10
Trichlorofluoromethane	ND	3
1,1-dichloroethene	ND	3
1,1-dichloroethane	ND	3
Trans-1,2-dichloroethene	ND	3
Chloroform	ND	3
1,2-dichloroethane	ND	3
1,1,1-trichloroethane	ND	3
Carbon tetrachloride	ND	3
Bromodichloromethane	ND	3
1,2-dichloropropane	ND	3
Cis-1,3-dichloropropene	ND	3
Trichloroethene	ND	4
Benzene	ND	2
Dibromochloromethane	ND	2
1,1,2-trichloroethane	ND	3
Trans-1,3-dichloropropene	ND	5
2-chloroethylvinylether	ND	3
Bromoform	ND	3
1,1,2,2-tetrachloroethane	ND	4
Tetrachloroethene	ND	4
Toluene	ND	2
Chlorobenzene	ND	3
Ethylbenzene	ND	3
1,3-dichlorobenzene	ND	3
1,2-dichlorobenzene	ND	3
1,4-dichlorobenzene	ND	3
Freon 113	ND	3
Total Xylenes	ND	3

ND = Not detected at or above limit of detection.

RECEIVED APR 3 1989

EPA METHOD 8240
PURGEABLE ORGANICS

Sample I.D.:	Method Blank	**Client:**	ANANIA GEOLOGIC ENG.
Sample Received:		**Client Ref. No.:**	
Sample Analyzed:	03/29/89	**Lab Client Code:**	0636
Sample Matrix:	Water	**Lab No.:**	8903178-MB

Compound	Concentration µg/L (ppb)	Limit of Detection µg/L (ppb)
Chloromethane	ND	10
Bromomethane	ND	4
Vinyl chloride	ND	4
Chloroethane	ND	4
Methylene chloride	ND	10
Trichlorofluoromethane	ND	3
1,1-dichloroethene	ND	3
1,1-dichloroethane	ND	3
Trans-1,2-dichloroethene	ND	3
Chloroform	ND	3
1,2-dichloroethane	ND	3
1,1,1-trichloroethane	ND	3
Carbon tetrachloride	ND	3
Bromodichloromethane	ND	3
1,2-dichloropropane	ND	3
Cis-1,3-dichloropropene	ND	3
Trichloroethene	ND	4
Benzene	ND	2
Dibromochloromethane	ND	2
1,1,2-trichloroethane	ND	3
Trans-1,3-dichloropropene	ND	5
2-chloroethylvinylether	ND	3
Bromoform	ND	3
1,1,2,2-tetrachloroethane	ND	4
Tetrachloroethene	ND	4
Toluene	ND	2
Chlorobenzene	ND	3
Ethylbenzene	ND	3
1,3-dichlorobenzene	ND	3
1,2-dichlorobenzene	ND	3
1,4-dichlorobenzene	ND	3
Freon 113	ND	3
Total Xylenes	ND	3

ND = Not detected at or above limit of detection.

RECEIVED APR 0 3 1989

EPA METHOD 8270
BASE/NEUTRALS AND ACIDS

Sample I.D.:	3869 MW-15	Client:	ANANIA GEOLOGIC ENG.
Sample Received:	03/28/89	Client Ref. No.:	
Sample Analyzed:	03/28/89	Lab Client Code:	0636
Sample Matrix:	Water	Lab No.:	8903178-01

	Concentration µg/L (ppb)	Limit of Detection µg/L (ppb)
ACID COMPOUNDS		
Phenol	ND	1
2-chlorophenol	ND	1
2-methyl phenol	ND	1
4-methyl phenol	ND	1
2-nitrophenol	ND	1
2,4-dimethylphenol	ND	1
2,4-dichlorophenol	ND	1
4-chloro-3-methylphenol	ND	1
2,4,5-trichlorophenol	ND	1
2,4,6-trichlorophenol	ND	1
2,4-dinitrophenol	ND	5
4-nitrophenol	ND	5
2-methyl-4,6-dinitrophenol	ND	1
pentachlorophenol	ND	1
BASE/NEUTRAL COMPOUNDS		
N-nitrosodimethylamine	ND	5
Bis(2-chloroethyl)ether	ND	1
1,3-dichlorobenzene	ND	1
1,4-dichlorobenzene	ND	1
1,2-dichlorobenzene	ND	1
Bis-(2-chloroisopropyl)ether	ND	1
N-nitrosodi-n-propylamine	ND	1
Hexachloroethane	ND	1
Nitrobenzene	ND	1
Isophorone	ND	1
Bis-(2-chloroethoxy)methane	ND	1
1,2,4-trichlorobenzene	ND	1
naphthalene	ND	1
hexachlorobutadiene	ND	1
2-chloronaphthalene	ND	1
2- Methyl Napthalene	ND	1

ND = Not detected at or above limit of detection

EPA METHOD 8270
BASE/NEUTRALS AND ACIDS
(Cont.d)

Sample I.D.: 3869 MW-15 Client: ANANIA GEOLOGIC ENG.

	Concentration µg/L (ppb)	Limit of Detection µg/L (ppb)
BASE/NEUTRAL COMPOUNDS		
4-chloroaniline	ND	5
2-nitroaniline	ND	5
3-nitroaniline	ND	5
4-nitroaniline	ND	5
hexachlorocyclopentadiene	ND	1
dimethyl phthalate	ND	10
acenaphthylene	ND	1
acenaphthene	ND	1
2,4-dinitrotoluene	ND	1
2,6-dinitrotoluene	ND	1
diethyl phthalate	ND	1
4-chlorophenylphenylether	ND	1
fluorene	ND	1
N-nitrosodiphenylamine	ND	1
4-bromophenylphenylether	ND	1
hexachlorobenzene	ND	1
phenanthrene	ND	1
anthracene	ND	1
di-n-butylphthalate	ND	1
fluoranthene	ND	1
benzidine	ND	30
pyrene	ND	1
benzylbutylphthalate	ND	1
3,3'-dichlorobenzidine	ND	40
benzo(a)anthracene	ND	1
bis-(2-ethylhexyl)phthalate	ND	10
Chrysene	ND	2
di-n-octylphthalate	ND	1
benzo(b)fluoranthene	ND	2
benzo(k)fluoranthene	ND	1
benzo(a)pyrene	ND	1
indeno(1,2,3-cd)pyrene	ND	1
dibenzo(a,h)anthracene	ND	1
benzo(ghi)perylene	ND	1

ND = Not detected at or above limit of detection

EPA METHOD 8270
BASE/NEUTRALS AND ACIDS

Sample I.D.:	3873 MW-16	Client:	ANANIA GEOLOGIC ENG.
Sample Received:	03/28/89	Client Ref. No.:	
Sample Analyzed:	03/28/89	Lab Client Code:	0636
Sample Matrix:	Water	Lab No.:	8903178-02

	Concentration µg/L (ppb)	Limit of Detection µg/L (ppb)
ACID COMPOUNDS		
Phenol	ND	1
2-chlorophenol	ND	1
2-methyl phenol	ND	1
4-methyl phenol	ND	1
2-nitrophenol	ND	1
2,4-dimethylphenol	ND	1
2,4-dichlorophenol	ND	1
4-chloro-3-methylphenol	ND	1
2,4,5-trichlorophenol	ND	1
2,4,6-trichlorophenol	ND	1
2,4-dinitrophenol	ND	5
4-nitrophenol	ND	5
2-methyl-4,6-dinitrophenol	ND	1
pentachlorophenol	ND	1
BASE/NEUTRAL COMPOUNDS		
N-nitrosodimethylamine	ND	5
Bis(2-chloroethyl)ether	ND	1
1,3-dichlorobenzene	ND	1
1,4-dichlorobenzene	ND	1
1,2-dichlorobenzene	ND	1
Bis-(2-chloroisopropyl)ether	ND	1
N-nitrosodi-n-propylamine	ND	1
Hexachloroethane	ND	1
Nitrobenzene	ND	1
Isophorone	ND	1
Bis-(2-chloroethoxy)methane	ND	1
1,2,4-trichlorobenzene	ND	1
naphthalene	ND	1
hexachlorobutadiene	ND	1
2-chloronaphthalene	ND	1
2- Methyl Napthalene	ND	1

ND = Not detected at or above limit of detection

EPA METHOD 8270
BASE/NEUTRALS AND ACIDS
(Cont.d)

Sample I.D.: 3873 MW-16 Client: ANANIA GEOLOGIC ENG.

	Concentration µg/L (ppb)	Limit of Detection µg/L (ppb)
BASE/NEUTRAL COMPOUNDS		
4-chloroaniline	ND	5
2-nitroaniline	ND	5
3-nitroaniline	ND	5
4-nitroaniline	ND	5
hexachlorocyclopentadiene	ND	1
dimethyl phthalate	ND	10
acenaphthylene	ND	1
acenaphthene	ND	1
2,4-dinitrotoluene	ND	1
2,6-dinitrotoluene	ND	1
diethyl phthalate	ND	1
4-chlorophenylphenylether	ND	1
fluorene	ND	1
N-nitrosodiphenylamine	ND	1
4-bromophenylphenylether	ND	1
hexachlorobenzene	ND	1
phenanthrene	ND	1
anthracene	ND	1
di-n-butylphthalate	ND	1
fluoranthene	ND	1
benzidine	ND	30
pyrene	ND	1
benzylbutylphthalate	ND	1
3,3'-dichlorobenzidine	ND	40
benzo(a)anthracene	ND	1
bis-(2-ethylhexyl)phthalate	510	10
Chrysene	ND	2
di-n-octylphthalate	10	1
benzo(b)fluoranthene	ND	2
benzo(k)fluoranthene	ND	1
benzo(a)pyrene	ND	1
indeno(1,2,3-cd)pyrene	ND	1
dibenzo(a,h)anthracene	ND	1
benzo(ghi)perylene	ND	1

ND = Not detected at or above limit of detection

EPA METHOD 8270
BASE/NEUTRALS AND ACIDS

Sample I.D.:	3688 MW-5	Client:	ANANIA GEOLOGIC ENG.
Sample Received:	03/28/89	Client Ref. No.:	
Sample Analyzed:	03/28/89	Lab Client Code:	0636
Sample Matrix:	Water	Lab No.:	8903178-03

	Concentration µg/L (ppb)	Limit of Detection µg/L (ppb)
ACID COMPOUNDS		
Phenol	ND	1
2-chlorophenol	ND	1
2-methyl phenol	ND	1
4-methyl phenol	ND	1
2-nitrophenol	ND	1
2,4-dimethylphenol	ND	1
2,4-dichlorophenol	ND	1
4-chloro-3-methylphenol	ND	1
2,4,5-trichlorophenol	ND	1
2,4,6-trichlorophenol	ND	1
2,4-dinitrophenol	ND	5
4-nitrophenol	ND	5
2-methyl-4,6-dinitrophenol	ND	1
pentachlorophenol	ND	1
BASE/NEUTRAL COMPOUNDS		
N-nitrosodimethylamine	ND	5
Bis(2-chloroethyl)ether	ND	1
1,3-dichlorobenzene	ND	1
1,4-dichlorobenzene	ND	1
1,2-dichlorobenzene	ND	1
Bis-(2-chloroisopropyl)ether	ND	1
N-nitrosodi-n-propylamine	ND	1
Hexachloroethane	ND	1
Nitrobenzene	ND	1
Isophorone	ND	1
Bis-(2-chloroethoxy)methane	ND	1
1,2,4-trichlorobenzene	ND	1
naphthalene	ND	1
hexachlorobutadiene	ND	1
2-chloronaphthalene	ND	1
2- Methyl Napthalene	ND	1

ND = Not detected at or above limit of detection

EPA METHOD 8270
BASE/NEUTRALS AND ACIDS
(Cont.d)

Sample I.D.: 3688 MW-5 Client: ANANIA GEOLOGIC ENG.

	Concentration µg/L (ppb)	Limit of Detection µg/L (ppb)
BASE/NEUTRAL COMPOUNDS		
4-chloroaniline	ND	5
2-nitroaniline	ND	5
3-nitroaniline	ND	5
4-nitroaniline	ND	5
hexachlorocyclopentadiene	ND	1
dimethyl phthalate	ND	10
acenaphthylene	ND	1
acenaphthene	ND	1
2,4-dinitrotoluene	ND	1
2,6-dinitrotoluene	ND	1
diethyl phthalate	ND	1
4-chlorophenylphenylether	ND	1
fluorene	ND	1
N-nitrosodiphenylamine	ND	1
4-bromophenylphenylether	ND	1
hexachlorobenzene	ND	1
phenanthrene	ND	1
anthracene	ND	1
di-n-butylphthalate	ND	1
fluoranthene	ND	1
benzidine	ND	30
pyrene	ND	1
benzylbutylphthalate	ND	1
3,3'-dichlorobenzidine	ND	40
benzo(a)anthracene	ND	1
bis-(2-ethylhexyl)phthalate	ND	10
Chrysene	ND	2
di-n-octylphthalate	ND	1
benzo(b)fluoranthene	ND	2
benzo(k)fluoranthene	ND	1
benzo(a)pyrene	ND	1
indeno(1,2,3-cd)pyrene	ND	1
dibenzo(a,h)anthracene	ND	1
benzo(ghi)perylene	ND	1

ND = Not detected at or above limit of detection

RECEIVED APR 03 1989

EPA METHOD 8270
BASE/NEUTRALS AND ACIDS

Sample I.D.:	Method Blank	Client:	ANANIA GEOLOGIC ENG.
Sample Received:		Client Ref. No.:	
Sample Analyzed:	03/28/89	Lab Client Code:	0636
Sample Matrix:	Water	Lab No.:	8903178-MB

	Concentration µg/L (ppb)	Limit of Detection µg/L (ppb)
ACID COMPOUNDS		
Phenol	ND	1
2-chlorophenol	ND	1
2-methyl phenol	ND	1
4-methyl phenol	ND	1
2-nitrophenol	ND	1
2,4-dimethylphenol	ND	1
2,4-dichlorophenol	ND	1
4-chloro-3-methylphenol	ND	1
2,4,5-trichlorophenol	ND	1
2,4,6-trichlorophenol	ND	1
2,4-dinitrophenol	ND	5
4-nitrophenol	ND	5
2-methyl-4,6-dinitrophenol	ND	1
pentachlorophenol	ND	1
BASE/NEUTRAL COMPOUNDS		
N-nitrosodimethylamine	ND	5
Bis(2-chloroethyl)ether	ND	1
1,3-dichlorobenzene	ND	1
1,4-dichlorobenzene	ND	1
1,2-dichlorobenzene	ND	1
Bis-(2-chloroisopropyl)ether	ND	1
N-nitrosodi-n-propylamine	ND	1
Hexachloroethane	ND	1
Nitrobenzene	ND	1
Isophorone	ND	1
Bis-(2-chloroethoxy)methane	ND	1
1,2,4-trichlorobenzene	ND	1
naphthalene	ND	1
hexachlorobutadiene	ND	1
2-chloronaphthalene	ND	1
2- Methyl Napthalene	ND	1

ND = Not detected at or above limit of detection

EPA METHOD 8270
BASE/NEUTRALS AND ACIDS
(Cont.d)

Sample I.D.: Method Blank Client: ANANIA GEOLOGIC ENG.

	Concentration µg/L (ppb)	Limit of Detection µg/L (ppb)
BASE/NEUTRAL COMPOUNDS		
4-chloroaniline	ND	5
2-nitroaniline	ND	5
3-nitroaniline	ND	5
4-nitroaniline	ND	5
hexachlorocyclopentadiene	ND	1
dimethyl phthalate	ND	10
acenaphthylene	ND	1
acenaphthene	ND	1
2,4-dinitrotoluene	ND	1
2,6-dinitrotoluene	ND	1
diethyl phthalate	ND	1
4-chlorophenylphenylether	ND	1
fluorene	ND	1
N-nitrosodiphenylamine	ND	1
4-bromophenylphenylether	ND	1
hexachlorobenzene	ND	1
phenanthrene	ND	1
anthracene	ND	1
di-n-butylphthalate	ND	1
fluoranthene	ND	1
benzidine	ND	30
pyrene	ND	1
benzylbutylphthalate	ND	1
3,3'-dichlorobenzidine	ND	40
benzo(a)anthracene	ND	1
bis-(2-ethylhexyl)phthalate	ND	10
Chrysene	ND	2
di-n-octylphthalate	ND	1
benzo(b)fluoranthene	ND	2
benzo(k)fluoranthene	ND	1
benzo(a)pyrene	ND	1
indeno(1,2,3-cd)pyrene	ND	1
dibenzo(a,h)anthracene	ND	1
benzo(ghi)perylene	ND	1

ND = Not detected at or above limit of detection

CHAIN OF CUSTODY RECORD

8903178

PROJ. NO. [redacted] SAMPLERS: (Signature) [redacted] TO MARK SCRUGGS

PROJECT NAME AND ADDRESS:
ANANIA Geologic Engineering
11330 Sunrise Dr
Rancho Cordova, Ca

72 hrs Rush

CROSS REFERENCE NUMBER	DATE	TIME	SOIL	WATER	STATION LOCATION	TOTAL PETROLEUM HYDROCARBONS	BTX	VOC-EPA 8240	TOTAL OIL & GREASE	8240	8270	REMARKS
1	3/28/89				3869 MW-~~15~~ 15					X	X	
2	3/28/89				3873 MW-16					X	X	
					3688 MW-5					X	X	

ANALYSIS REQUESTED

RELINQUISHED BY: (Signature)	DATE / TIME	RECEIVED BY: (Signature)	DATE / TIME
S Sidhu	3/28/89 12:30	Terry Salio	3-28-89 2:05
RELINQUISHED BY: (Signature)	DATE / TIME	RECEIVED BY: (Signature)	DATE / TIME
RELINQUISHED BY: (Signature)	DATE / TIME	RECEIVED BY: (Signature)	DATE / TIME
RELINQUISHED BY: (Signature)	DATE / TIME	RECEIVED FOR LABORATORY BY: (Signature)	DATE / TIME

RECEIVED APR 03 1989

Precision Analytical Laboratory, Inc.

4136 LAKESIDE DRIVE, RICHMOND, CA 94806 PHONE (415) 222-3002 FAX (415) 222-1251

CERTIFICATE OF ANALYSIS

State License No. 211

Received: 03/28/89
Reported: 03/31/89
Job No #: 70759

Attn: Mary Scruggs
Anania Geological Engineering
11330 Sunrise Park Drive, Suite C
Rancho Cordova, CA. 95742

Project: #004-88-059

Total Petroleum Hydrocarbon Analysis:
By EPA 5030 & DHS Extraction Method
Total Lead: By EPA 6010
mg/l

Lab ID	Client ID	Diesel	Gasoline	Total Lead
70759-1	3884	ND<0.5	ND<0.5	ND<0.044
70759-2	3685	ND<0.5	ND<0.5	ND<0.044
70759-3	3688	ND<0.5	ND<0.5	ND<0.044
70759-4	3697	ND<0.5	ND<0.5	ND<0.044
70759-5	3700	ND<0.5	ND<0.5	ND<0.044

QA/QC: Spike Recovery for Diesel: 112%
Spike Recovery for Gasoline: 96%
Spike Recovery for Lead: 77%

Detection Limit for Diesel: 0.5
Detection Limit for Gasoline: 0.5
Detection Limit for Lead: 0.044

Jaime Chew
Laboratory Director

Precision Analytical Laboratory, Inc.

4136 LAKESIDE DRIVE, RICHMOND, CA 94806 PHONE (415) 222-3002 FAX (415) 222-1251

CERTIFICATE OF ANALYSIS

State License No. 211

Received: 03/28/89
Reported: 03/31/89
Job No #: 70759

Attn: Mary Scruggs
Anania Geological Engineering
11330 Sunrise Park Drive, Suite C
Rancho Cordova, CA. 95742

Project: #004-88-059

Aromatic Volatile Hydrocarbon Analysis:
EPA Method 8020
ug/l

Lab ID	Client ID	Benzene	Toluene	MDL
70759-1	3884	ND<0.3	<0.3	0.3
70759-2	3685	ND<0.3	<0.3	0.3
70759-3	3688	ND<0.3	<0.3	0.3
70759-4	3697	ND<0.3	<0.3	0.3
70759-5	3700	ND<0.3	0.4	0.3

Lab ID	Client ID	Ethylbenzene	Xylene	MDL
70759-1	3884	ND<0.3	<0.3	0.3
70759-2	3685	ND<0.3	<0.3	0.3
70759-3	3688	<0.3	<0.3	0.3
70759-4	3697	ND<0.3	<0.3	0.3
70759-5	3700	<0.3	0.47	0.3

QA/QC: Spike Recovery Average: 93 %

Jaime Chow
Laboratory Director

Precision Analytical Laboratory, Inc.

4136 LAKESIDE DRIVE, RICHMOND, CA 94806 PHONE (415) 222-3002 FAX (415) 222-1251

CERTIFICATE OF ANALYSIS

State License No. 211

Received: 03/28/89
Reported: 03/31/89
Job No #: 70759

Attn: Mary Scruggs
Anania Geological Engineering
11330 Sunrise Park Drive, Suite C
Rancho Cordova, CA. 95742

Project: #004-88-059

Oil & Grease Analysis
By Standard Method 503D
mg/l

Lab ID	Client ID	Oil & Grease	MDL
70759-3	3688	<50	50

QA/QC: Spike Recovery for Oil & Grease: 100%

Detection Limit for Oil & Grease: 50

Jaime Chow
Laboratory Director

Precision Analytical Laboratory, Inc.

4136 LAND SIDE DRIVE, RICHMOND CA 94806 PHONE (415) 222-3002 FAX (415) 222-1251

CERTIFICATE OF ANALYSIS

STATE LICENSE NO. 211

Received: 03/17/89
Reported: 03/22/89
Job #: 70735

Attn: Tom Edwards
Anania Geological Engineering
11330 Sunrise Park Drive, Suite C.
Rancho Cordova, CA. 95742

Project: #004-88-059

Analysis Method EPA 6010

Lab ID	Client ID	Total Lead	MDL	Units
70735-1	3657 MW-10	5.0	0.044	mg/kg
70735-2	3658 MW-10	10.1	0.044	mg/kg
70735-3	3661 MW-9	7.3	0.044	mg/kg
70735-4	3662 MW-9	8.2	0.044	mg/kg
70735-5	3663 MW-1	0.1	0.044	mg/l
70735-6	3664 MW-10	0.1	0.044	mg/l
70735-7	3149 MW-14	6.4	0.044	mg/kg
70735-8	3150 MW-14	4.6	0.044	mg/kg
70735-9	3151 MW-14	12.1	0.044	mg/kg
70735-10	3152 MW-14	7.3	0.044	mg/kg
70735-11	3157 MW-15	4.0	0.044	mg/kg
70735-12	3159 MW-15	8.1	0.044	mg/kg
70735-13	3160 MW-15	8.6	0.044	mg/kg
70735-14	3153 MW-7	21	0.044	mg/kg
70735-15	3154 MW-7	10.8	0.044	mg/kg
70735-16	3155 MW-7	5.5	0.044	mg/kg
70735-17	3156 MW-7	8.2	0.044	mg/kg

QA/QC: Spike Recovery for Lead: 78 %

MDL: Method detection limit; Compound below this level would not be detected.

Jaime Chow
Laboratory Director

ANANIA GEOLOGIC ENGINEERING

AGE No. 1005

PROJECT NO.	LAB REPORT NO.
004-88-057	
P.O. NO.	SAMPLERS: (signature)
	Eric J. Fish

LAB LOG NO.	DATE	TIME	SAMPLE I.D.	NO. OF CONTAINERS	SAMPLE TYPE: SOIL COMP	SOIL GRAB	WATER	TPH Gas & diesel	BTEX 8020	TTLC Lead	Fat oil & Grease	8240	8270		REMARKS
	3/24/89	1:30	3841 MW-9	4			X	X	X	X	X				
		1:45	3845 MW-10	6			X	X	X	X	X	X	X		
		2:25	3853 MW-11	4			X	X	X	X	X				
		2:50	3850 MW-12	4			X	X	X	X	X				
	↓	3:10	3857 MW-13	6			X	X	X	X	X	X	X		

RELINQUISHED BY: (signature)	DATE/TIME	RECEIVED BY: (signature)
Eric J. Fish	3/24/89 4:00	Bill Boyle
RELINQUISHED BY: (signature)	DATE/TIME	RECEIVED BY: (signature)
Bill Boyle	3/27/89 5:00	
RELINQUISHED BY: (signature)	DATE/TIME	RECEIVED BY: (signature)

REMARKS:
Rush
24 hour on TPH, BTEX, TTLC Lead, Fat oil & Grease
72 hour 8240, 8270

SEND RESULTS TO:
ATTN: Mary Scruggs
46E
11330 Sunrise Gold
Rancho Cordova, CA
PHONE NO. (916) ~~451-0921~~

631-0154

CHAIN OF CUSTODY

White- AGE Yellow – LAB Copy Pink- File

ANANIA GEOLOGIC ENGINEERING

AGE

PROJECT NO.	LAB REPORT NO.
004-88-059	
P.O. NO.	SAMPLERS: (signature)
	Eric J. Ohlson

LAB LOG NO.	DATE	TIME	SAMPLE I.D.	NO. OF CONTAINERS	SAMPLE TYPE: SOIL COMP	SAMPLE TYPE: SOIL GRAB	SAMPLE TYPE: WATER	ANALYSES: TPH 418.1 Gas & diesel	ANALYSES: BTEX 8020	ANALYSES: TTLC Lead	ANALYSES: 8240	ANALYSES: 8270			REMARKS
	3/27/89	2:00	3865	3			X	X	X	X					
		1:45	3869	5			X	X	X	X	X	X			
		2:25	3873	5			X	X	X	X	X	X			
	↓	3:25	3881	3			X	X	X	X					

RELINQUISHED BY: (signature)	DATE/TIME	RECEIVED BY: (signature)
Eric J. Ohlson	3/27 4:30	Ronna Callaghan
RELINQUISHED BY: (signature)	DATE/TIME	RECEIVED BY: (signature)
RELINQUISHED BY: (signature)	DATE/TIME	RECEIVED BY: (signature)

REMARKS:

Rush

TPH, BTEX, TTLC Pb – 24hr.

8240, 8270 – Sent out 72hr rush

SEND RESULTS TO:

ATTN: Mary Scruggs
AGE
11330 Sunrise Ct.
Rancho Cordova, CA

PHONE NO. (916) ~~451-0821~~

631-0154

CHAIN OF CUSTODY

White – AGE Yellow – LAB Copy Pink – File

ANANIA GEOLOGIC ENGINEERING

AGE No. 1067

PROJECT NO.	LAB REPORT NO.
004-88-059	

P.O. NO.	SAMPLERS: (signature)
	E. J. Anania

LAB LOG NO.	DATE	TIME	SAMPLE I.D.	NO. OF CONTAINERS	SAMPLE TYPE: SOIL COMP	SOIL GRAB	WATER	ANALYSES: TPH MBAS gas & diesel	BTEX 8020	TTLC Lead	8240	8270	Fuel oil & grease		REMARKS
	3/28/89	9:30	3884	3			X	X	X	X					
	↓	10:00	3685	3			X	X	X	X					
	↓	10:30	3688	6			X	X	X	X	X	X	X		
	↓	11:40	3697	3			X	X	X	X					
	↓	12:00	3700	3			X	X	X	X					
				0											

RELINQUISHED BY: (signature)	DATE/TIME	RECEIVED BY: (signature)
E. J. Anania	3/28/89 12:30	Sridhu 12:30
RELINQUISHED BY: (signature)	DATE/TIME	RECEIVED BY: (signature)
RELINQUISHED BY: (signature)	DATE/TIME	RECEIVED BY: (signature)

REMARKS:
TPH, BTEX & TTLC
24 hr. Rush
8240, 8270, Fuel oil & grease
72 hr Rush

SEND RESULTS TO:
ATTN: Mary Scruggs
AGE
11330 Sunrise Ct. #C
Rancho Cordova, CA
PHONE NO. (916) ~~451-0821~~

631-0154

CHAIN OF CUSTODY

White- AGE Yellow – LAB Copy Pink- File

[redacted]NAN[redacted]EOLO[redacted] ENG[redacted]ERING[redacted] AGE

PROJECT NO.	LAB REPORT NO.
004-88-059	

P.O. NO.

SAMPLERS: (signature) [signature]

LAB LOG NO.	DATE	TIME	SAMPLE I.D.	NO. OF CONTAINERS	SAMPLE TYPE: SOIL COMP	SAMPLE TYPE: SOIL GRAB	SAMPLE TYPE: WATER	ANALYSES: TTLC Total Lead	TPH as fuel Mod. 8015	BTEX 8010	Fat oil grease 503 D/E				REMARKS
	3/16/89	12:30	3657 MW-10	1		X		X	X	X					
	3/16/89	1:00	3658 MW-10	1		X		X	X	X					
	3/17/89	7:38	3661 MW-9	1		X		X	X	X					
	3/17/89	8:00	3662 MW-9	1		X		X	X	X	X				
	3/17/89	12:25	3663 MW-1	1			X	X							
	3/17/89	12:45	3664 MW-10	1			X	X							
	3/17	8:00	3149 MW 14	1		X		X	X	X					
	3/17	8:10	3150 MW 14	1		X		X	X	X					
	3/17	8:25	3151 MW 14	1		X		X	X	X					
	3/17	5:00	3152 MW 14	1		X		X	X	X					
	3/17	10:30	3157 MW 15	1		X		X	X	X					
	3/17	1:00	3159 MW 15	1		X		X	X	X					
	3/17	1:15	3160 MW 15	1		X		X	X	X					

RELINQUISHED BY: (signature)	DATE/TIME	RECEIVED BY: (signature)
Eric J. [signature]	3/17/89 1:15	[signature]
Mary J. Scruggs	3/17/89 3:30	[signature]

REMARKS: Rush Turnaround

SEND RESULTS TO: AGE
ATTN: Mary Scruggs
11??? Sunrise Park Dr.
Suite C
Rancho Cordova, CA 95742
PHONE NO. (916) 451-0021

CHAIN OF CUSTODY

White- AGE Yellow – LAB Copy Pink- File

3-31-059