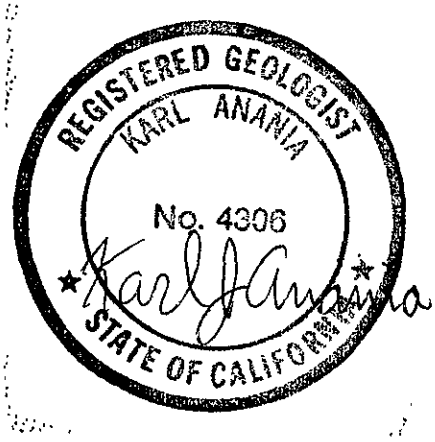
10/19/89

SUMMARY REPORT FOR THE PERIOD OF APRIL THROUGH JULY 1989 CARNATION DAIRY FACILITY OAKLAND, ALAMEDA COUNTY, CALIFORNIA

October 9, 1989

AGE Project No. 004-88-059



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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

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APPENDICES

AGE
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SUMMARY REPORT FOR THE PERIOD OF APRIL THROUGH JULY 1989 CARNATION DAIRY FACILITY OAKLAND, ALAMEDA COUNTY, CALIFORNIA

October 9, 1989

AGE Project No. 004-88-059

1.0 INTRODUCTION

Carnation Corporate Counsel, Howard R. Shmuckler, authorized Karl J. Ananaia of Anania Geologic Engineering (AGE) to prepare a quarterly summary report from April through July, 1989, for Carnation's Oakland Dairy facility (Facility). This report was also written at the request of the Alameda County Health Department, Hazardous Materials Division (County). The County requires this report as part of a quarterly groundwater monitoring program and site characterization update. The AGE Preliminary Site Characterization Report (April 3, 1989) presented data and recommendations for the period January of 1989 to March 1989.

1.1 Purpose

The purpose of this report is to provide an update on the removal of free product from the groundwater surface; to review the ongoing bioremediation of soil excavated during the removal of the four underground fuel tanks and one waste oil tank in January 1989; and to present data collected during additional site characterization from April to July 1989. Data collected from August through October, 1989 will be evaluated and reported in the next summary report.

1.2 Scope of Work

The authorized and approved scope of services addressed in this summary report include the following:

1) The current status of on-site surface soil bioremediation;

2) Up to date levels of free product in on-site product recovery probes;

3) The cumulative amount of free product recovered to date;

4) An evaluation of vadose zone soil contamination and status of the vapor extraction system to be used to remediate the vadose zone;

5) Status of the groundwater extraction and treatment system to be used to clean contaminated groundwater;

6) The results of further on-site investigations;

7) The results of preliminary off-site investigations north of the facility;

8) The preliminary results of an aquifer test performed to characterize the unconfined aquifer at the facility;

9) The lateral definition of on-site contaminant plumes;

10) An evaluation of the hydraulic gradient at this site;

11) The results of soil samples collected from on-site borings; and

12) The results of groundwater sampled from on-site monitoring wells that do not contain free product in April and June of 1989.

2.0 REMEDIATION

2.1 General

Since January 1989, AGE has incorporated several remedial techniques to treat contamination at the Oakland Facility. AGE has used free product recovery, in situ bioremediation, and surface soil bioremediation to remediate the groundwater aquifer and soils contaminated from five former underground tanks and associated dispensing lines. It was estimated that as much as 100,000 gallons of gasoline and diesel fuel were released into the subsurface at the Oakland Facility. To date, it is estimated that over half of the free product has been successfully remediated by in situ bioremediation and free product recovery. Animal fat, possibly originating from sewer leaks, has also contaminated on-site soil and groundwater. This contaminant has been successfully remediated through in situ bio-treatment. A Remedial Action Plan, prepared

by AGE and dated April 3, 1989, outlined the steps to be taken to remediate this Facility. This section addresses the current status of remedial action.

2.2 In Situ Bioremediation

AGE has demonstrated that bioremediation is a cost-effective and environmentally sound remedial technique at the Oakland Facility. The bioremediation operation has two main applications, in situ treatment of groundwater and microbial treatment of excavated soil.

Initial site characterization identified two individual free product plumes, a diesel plume and a gasoline plume. Animal fat was identified at the groundwater/free product interface. In situ bio-treatment is accomplished by inoculating microorganisms into the aquifer through every product recovery probe containing free product. Every two to three weeks 100 gallons of bacterial solution is introduced into the aquifer at a volume of two gallons per probe. This allows for an even distribution of the solution.

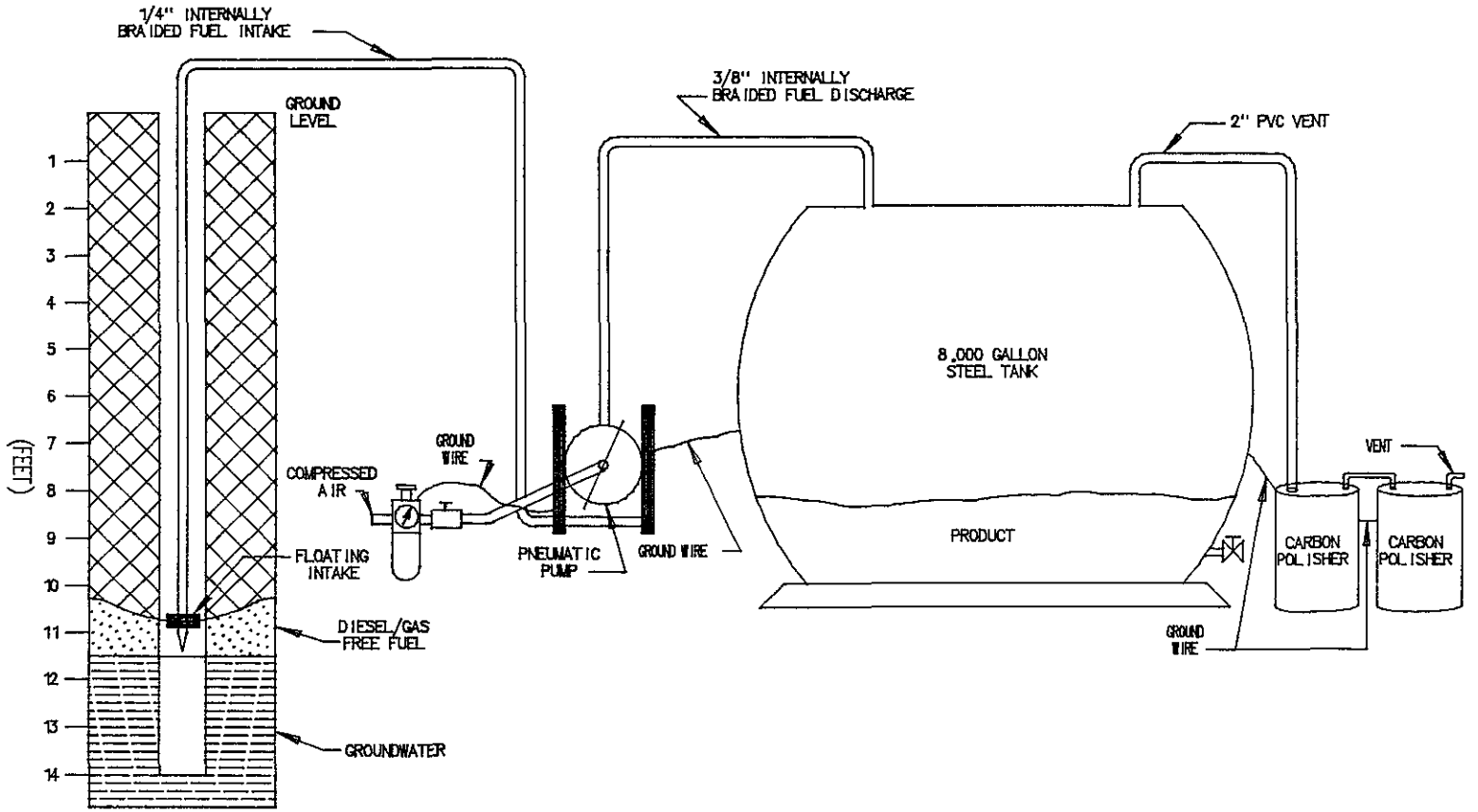
The bacterial solutions are a mixture of native soil microorganisms capable of degrading hydrocarbons. Native soils contain the same microorganisms, but not in numbers sufficient to effectively degrade hydrocarbons or animal fat. The microorganism solutions used at the Oakland Facility are specifically designed to speed up the natural degradation of the gasoline, diesel, and animal fat in the subsurface. Biorestoration has become an attractive remedial alternative, particularly because the microbial solutions degrade pollutants to carbon dioxide and water.

To increase microbial activity, air is injected into the product recovery probes using a portable air injection system. A schematic of the air injection system is shown in Figure 1. Air is introduced to the aquifer through an air bubbler submersed in the groundwater. To alleviate the problem of building up pressure in a well and depressing the groundwater, inlet pressures are kept at one to two pounds per square inch (psi) and air is allowed to escape at the top of the well. The air that escapes the well is channeled through a carbon adsorption unit. The unit is monitored and if total petroleum hydrocarbons emissions levels exceed 100 parts per million (ppm), a new carbon adsorption unit is installed.

2.3 Product Thickness

Product thickness contour maps from May 5, 1989 through August 4, 1989 suggest that the areal extent of the main plume is decreasing (Figures 2 through 9). Average free product thickness levels of two to three feet have been reduced to a level of approximately one-half foot. Some areas no longer have free product in the

FIGURE 1

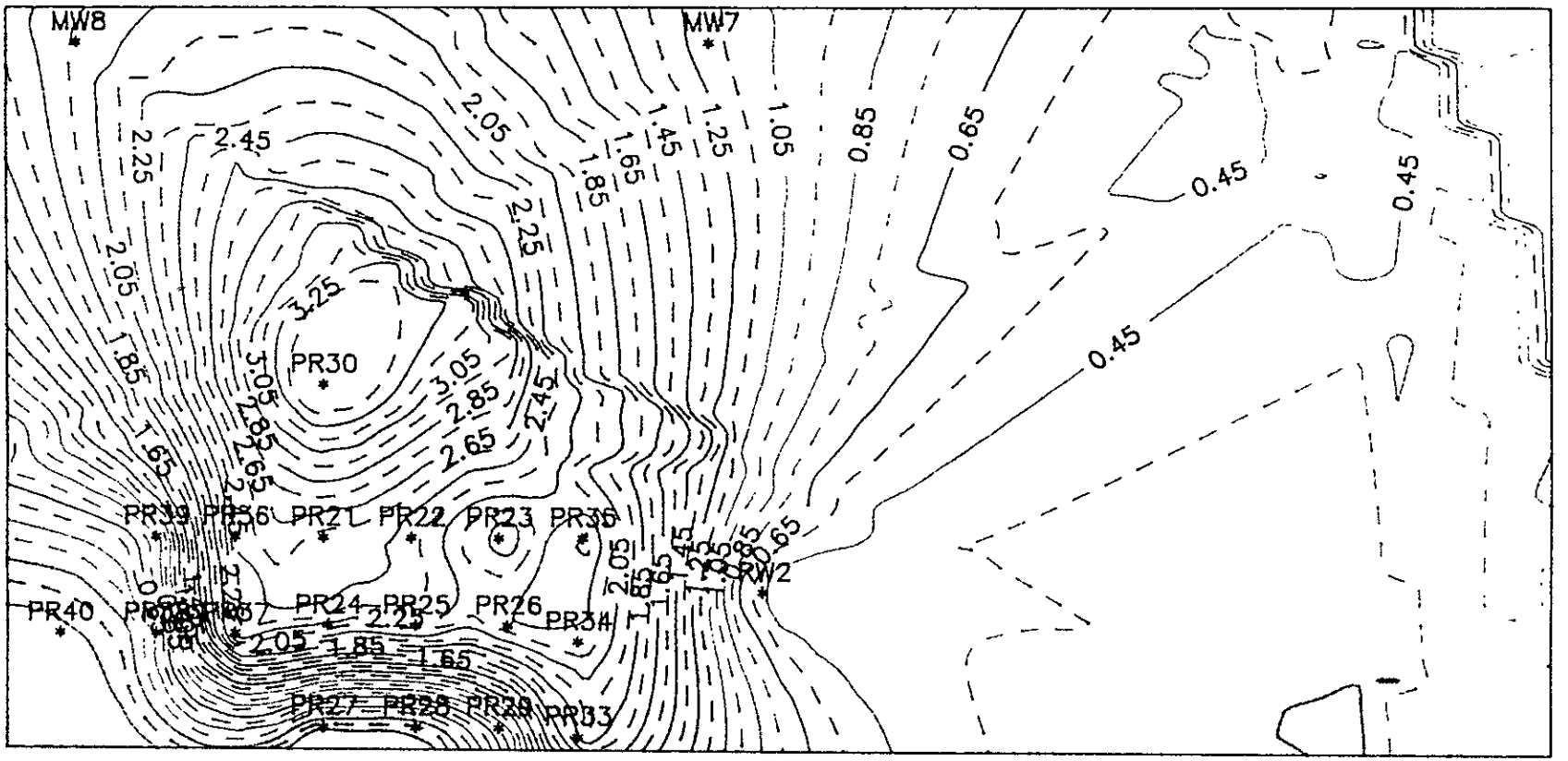


AGE
ANANIA GEOLOGIC ENGINEERING

TITLE: AIR INJECTION SCHEMATIC		
PROJECT NAME: CARNATION/OAKLAND		PROJECT NO: 004-88-059
SITE LOCATION: 1310 14TH ST. AT POPLAR OAKLAND, CA.		
DATE: 10-9-89	DRAWING NO: 059-022	SCALE NONE

FIGURE 2

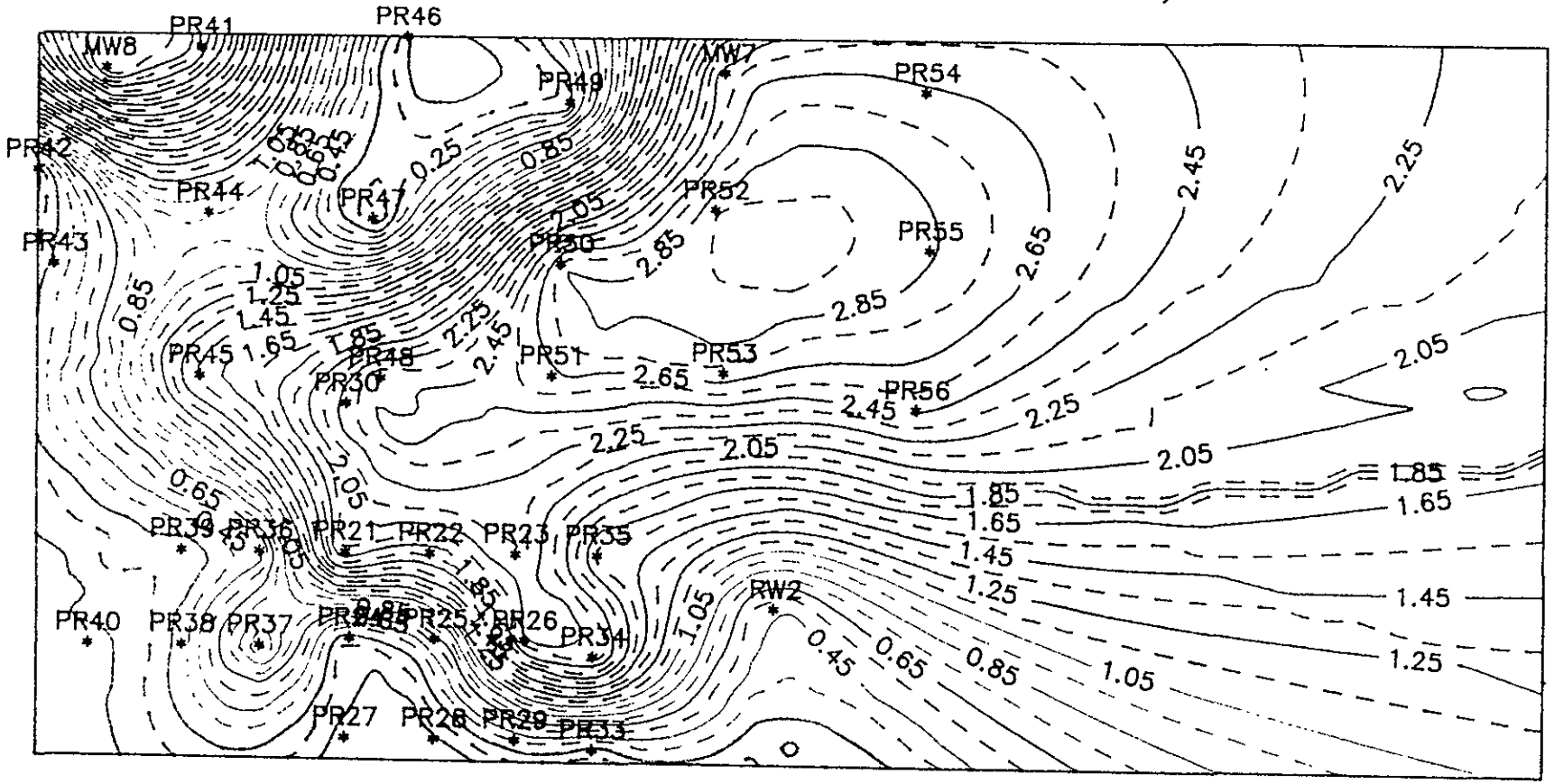
PRODUCT THICKNESS (MARCH 8, 1989)



SCALE 1 inch = 20 FEET

FIGURE 3

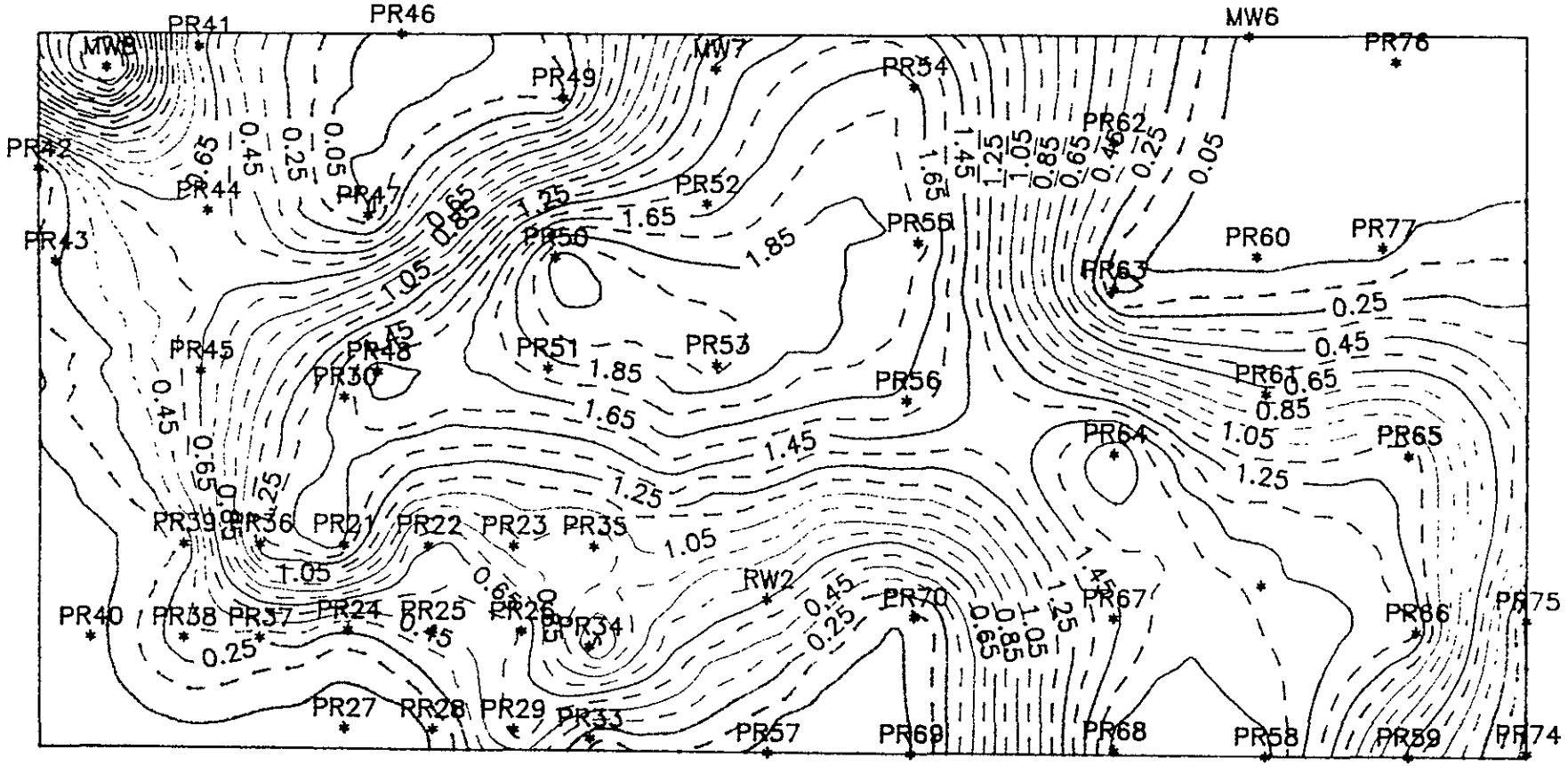
PRODUCT THICKNESS (MAY 4, 1989)



SCALE 1 inch = 20 FEET

FIGURE 4

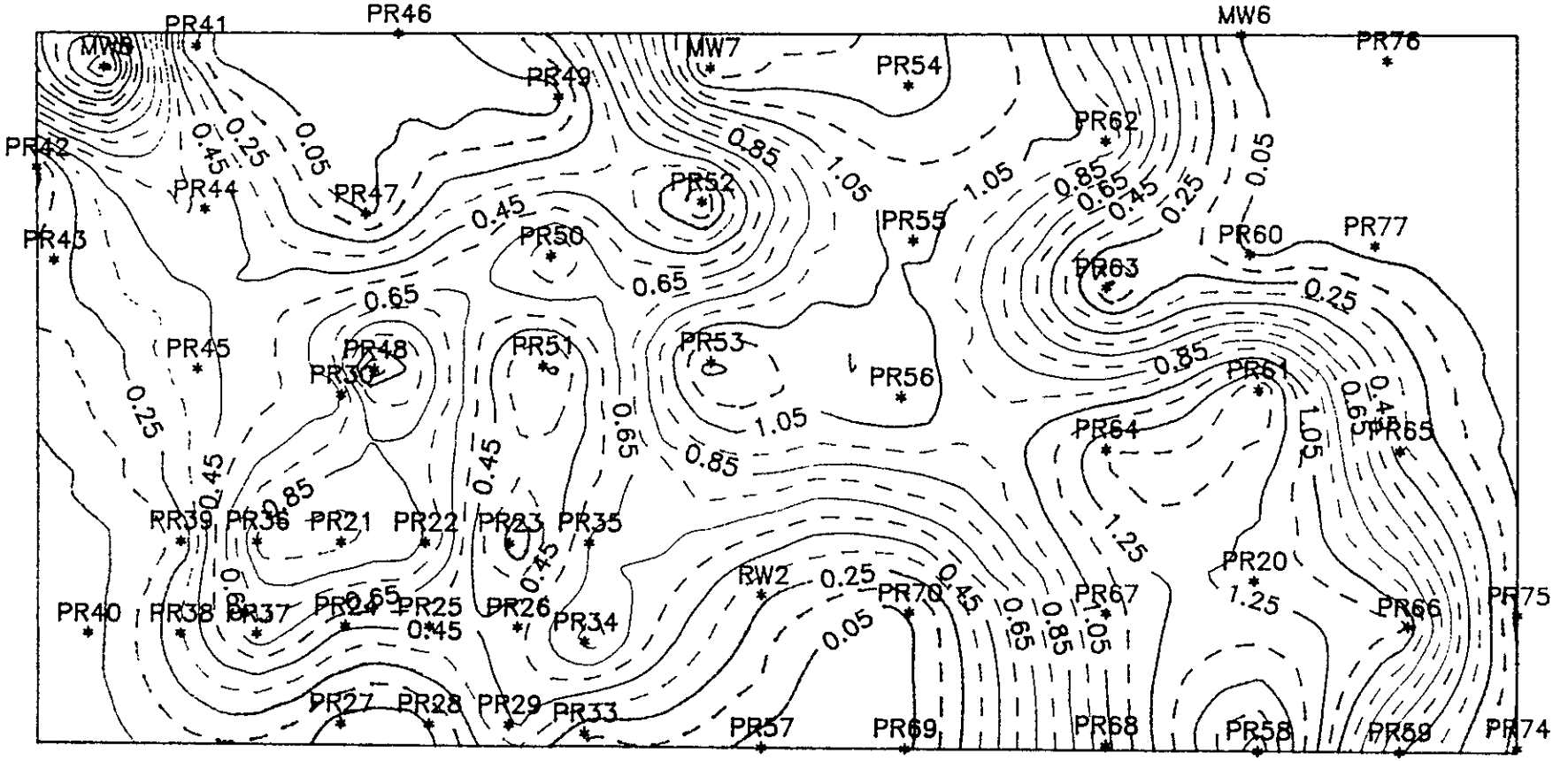
PRODUCT THICKNESS (MAY 30, 1989)



SCALE 1 inch = 20 FEET

FIGURE 5

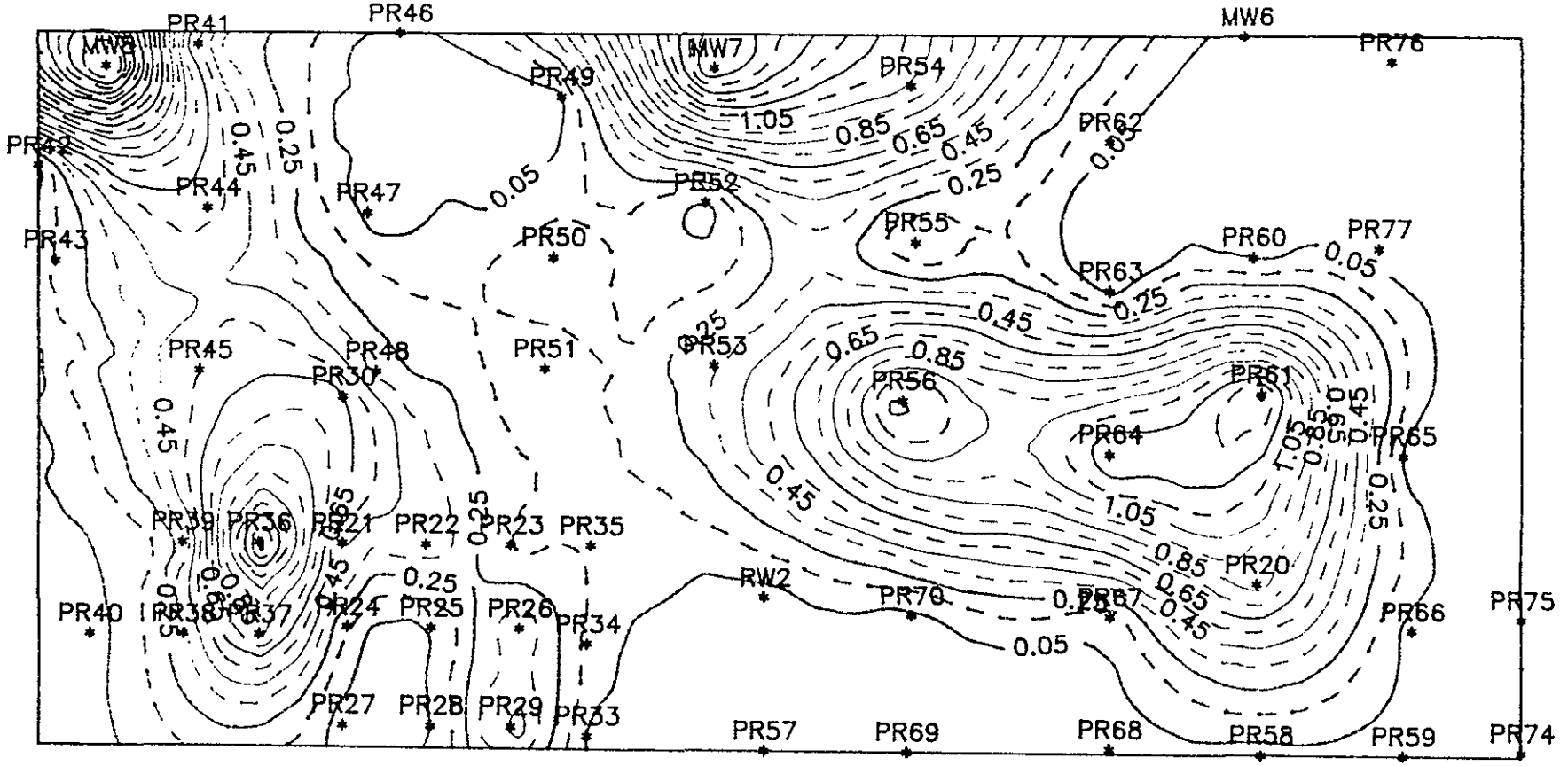
PRODUCT THICKNESS (JULY 5, 1989)



SCALE 1 inch = 20 FEET

FIGURE 6

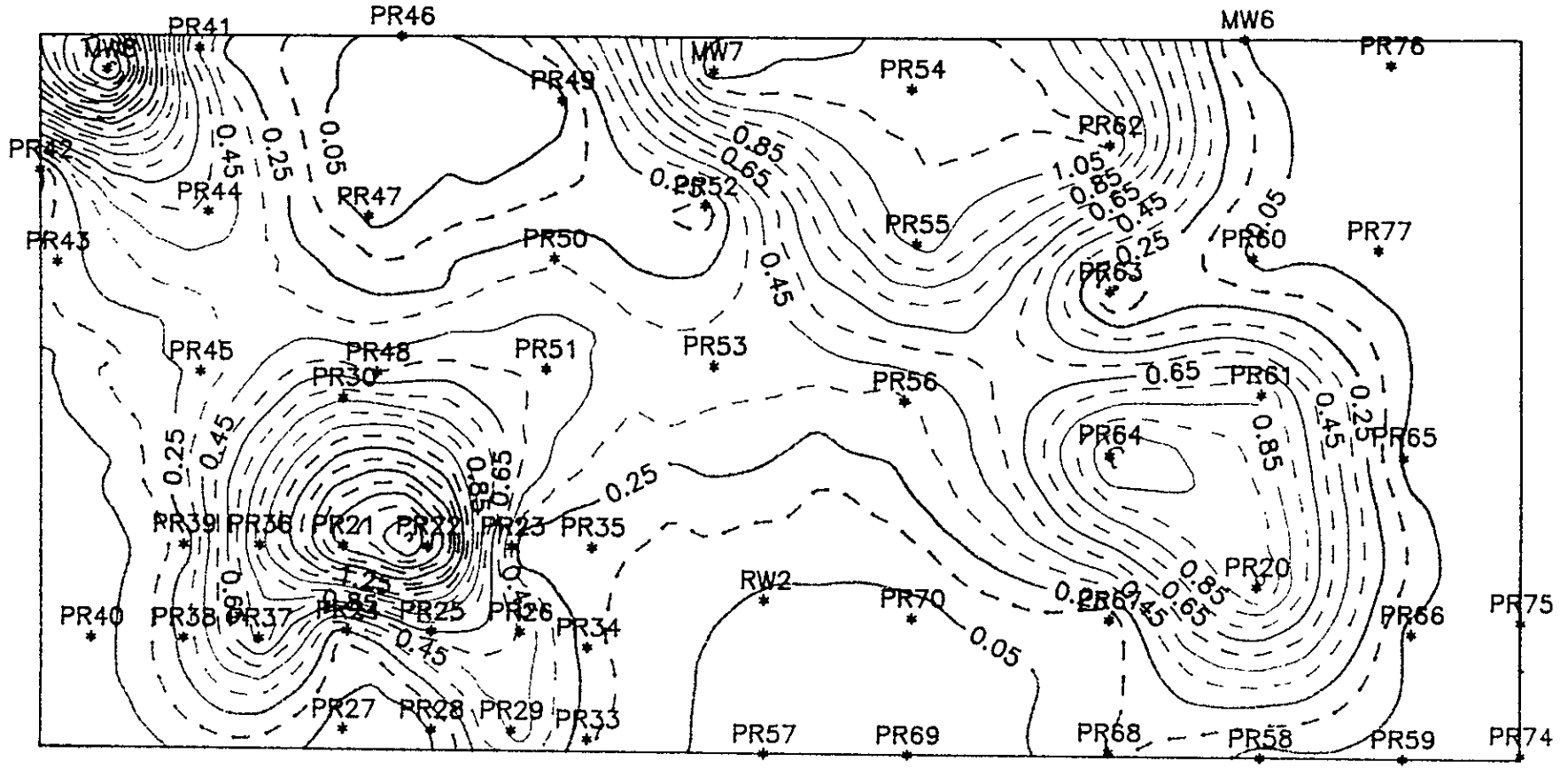
PRODUCT THICKNESS (JULY 14, 1989)



SCALE 1 inch = 20 FEET

FIGURE 7

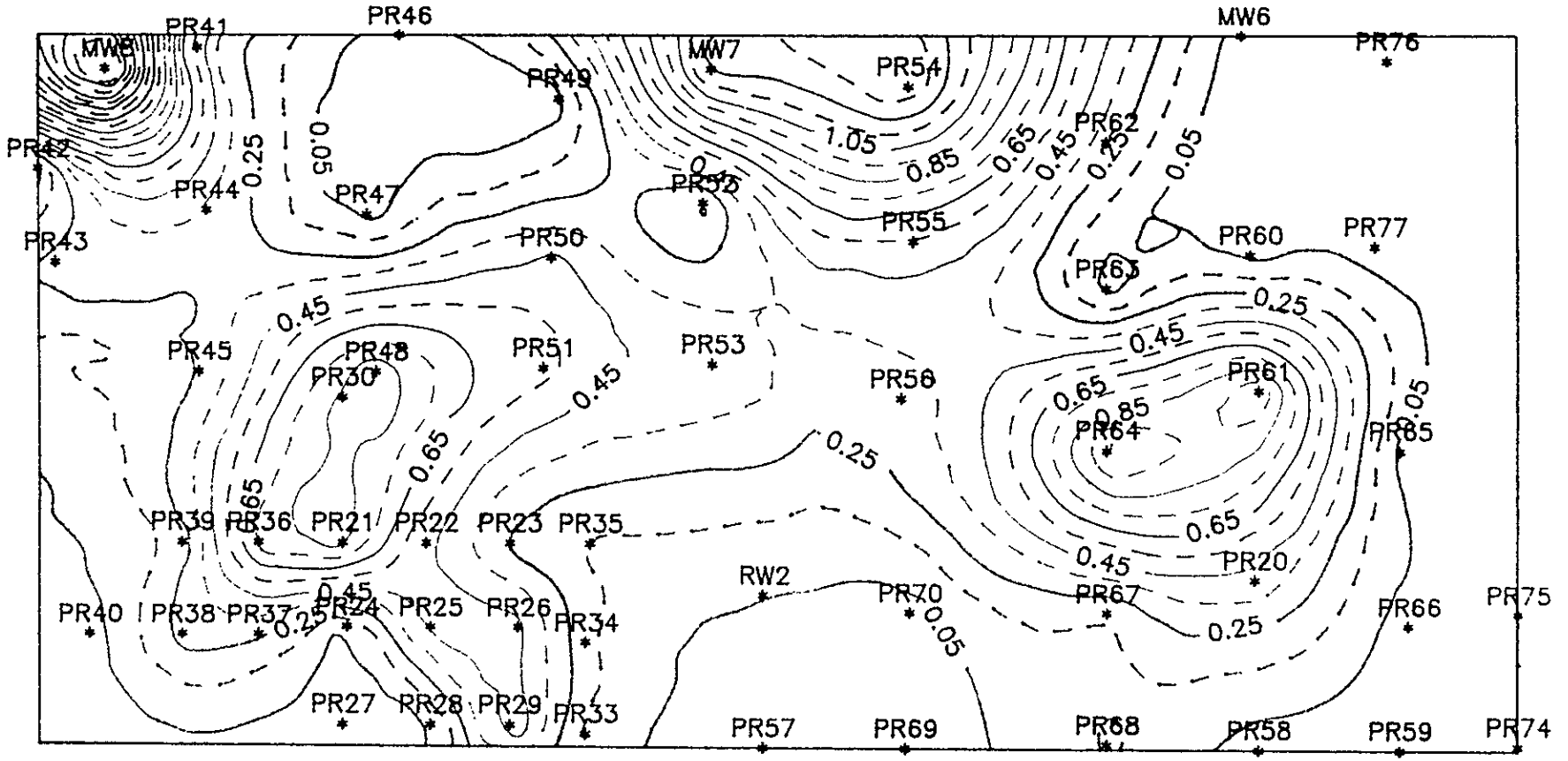
PRODUCT THICKNESS (JULY 21, 1989)



SCALE 1 inch = 20 FEET

FIGURE 8

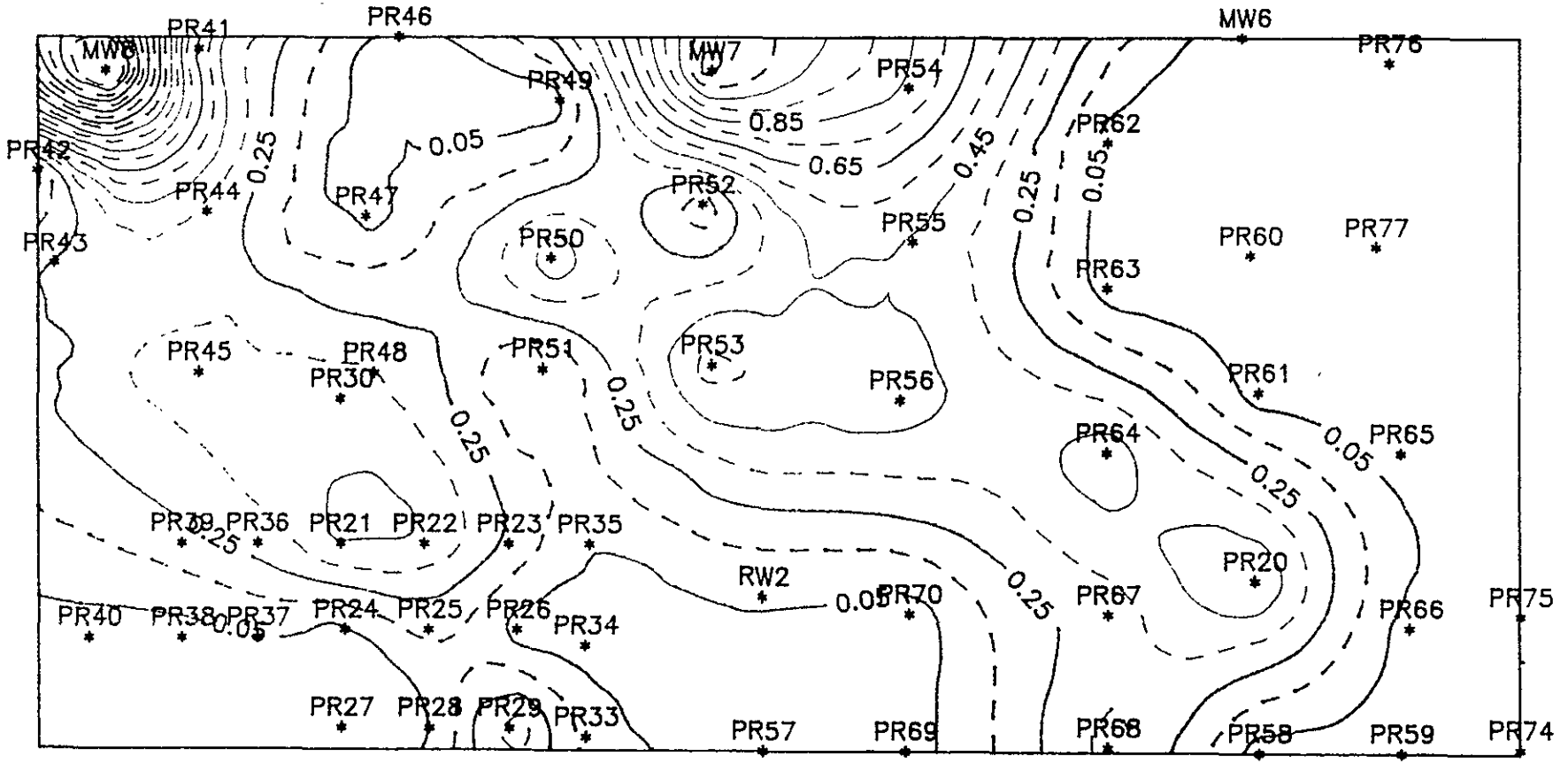
PRODUCT THICKNESS (JULY 28, 1989)



SCALE 1 inch = 20 FEET

FIGURE 9

PRODUCT THICKNESS (AUGUST 4, 1989)



SCALE 1 inch = 20 FEET

recovery probes. Tabular product thickness measurements are included in Table 1. Product thicknesses in recovery probes within the smaller diesel plume have also been reduced to less than one foot. Access for measurements in some recovery probes has been restricted because of the ongoing soil bioremediation effort.

2.4 Product Recovery

At the County's request, on February 15, 1989, AGE began recovering free product from the gasoline plume. A pneumatic skimming system was installed to withdraw free product without drawing down the groundwater table. AGE has not pumped groundwater, since drawing down the water table might further contaminate clean soil below the water table and possibly distend the plume. Once the plume has been defined or all of the free product has been removed, pumping the groundwater and creating a cone of depression can be considered as a remedial measure.

Changes have been made to the skimming system since the Remedial Action Plan, dated April 3, 1989. The system was upgraded from four to eight skimmers. The skimmers are moved from probe to probe as free product is removed. Currently, both systems are equipped with new diaphragm pumps and it appears recovery has subsequently increased.

To date, approximately 5,000 gallons of free product have been recovered (Figure 10). Forty-six hundred gallons have been manifested off site to Gibson Oil and Refinery in Bakersfield, California to be refined into usable petroleum product. The chemical identity of the material manifested off site and its accompanying Uniform Hazardous Waste Manifest are contained in Appendix A.

Forty-four new product recovery probes were installed to remove free product and to further define the two on-site free product plumes identified in the Remedial Action Plan. Plate 1 is an updated project boring location map. Product recovery probe numbers PR-71 through PR-73 and PR-78 through PR-81 were installed to further define the lateral extent of the diesel plume located south of the fuel tank excavation. Recovery probes PR-82 through PR-84 were installed as piezometers to be used as observation points during the on-site aquifer test. North of the fuel tank excavation, in the main plume, recovery probes PR-41 through PR-70 were installed inside and around the shop building. The western, eastern and southern boundaries of the main gasoline plume have been identified on-site. The extent of the diesel plume has also been identified on-site. Boring logs for the product recovery probes are included in Appendix B.

TABLE 1
PRODUCT THICKNESS MEASUREMENTS
CARNATION OAKLAND DAIRY FACILITY

Anania Geologic Engineering

DATE	RW-1	RW-2	PR-12	PR-20	PR-21	PR-22	PR-23	PR-24	PR-25	PR-26	PR-27	PR-28	PR-29
March 8, 1989	0.03	0.34	1.73	3.17	2.49	2.39	1.9	2.29	2.33	2.24	nfp	nfp	0.65
May 4, 1989	0.02	0.38	0.69	2.42	2.08	1.76	2.22	0.04	0.49	2.06	nfp	nfp	0.34
May 30, 1989	0.02	0.38	1.3	1.81	1.54	0.53	0.96	0.18	0.48	0.5	nfp	nfp	0.69
July 5, 1989	****	0.25	0.77	1.21	0.98	0.92	*0.1	0.45	0.47	0.5	nfp	nfp	0.5
July 14, 1989	nfp	nfp	0.26	0.93	0.4	0.46	*0.12	0.1	nfp	0.46	nfp	nfp	0.56
July 21, 1989	nfp	*0.03	****	1.12	*1.75	*2.11	0.15	0.09	0.64	0.57	nfp	nfp	0.55
July 28, 1989	nfp	0.05	****	0.43	0.92	0.52	0.22	nfp	0.53	0.48	nfp	nfp	0.56
August 4, 1989	nfp	0.06	****	**0.58	0.47	0.45	0.24	nfp	0.18	nfp	nfp	nfp	0.46
August 11, 1989	0.05	nfp	****	0.4	**0.58	**0.42	nfp	nfp	0.06	nfp	nfp	nfp	0.39
August 18, 1989	0.05	0.03	****	**0.86	1.02	0.79	0.11	nfp	0.1	***nfp	nfp	nfp	*0.4
August 28, 1989	0.08	0.05	****	0.87	0.83	0.73	0.13	nfp	0.07	0.02	nfp	nfp	0.31

DATE	PR-30	PR-31	PR-32	PR-33	PR-34	PR-35	PR-36	PR-37	PR-38	PR-39	PR-40	PR-41	PR-42
March 8, 1989	3.65	0.03	0.1	1.97	2.27	2.43	2.51	2.38	0.39	0.72	nfp	----	----
May 4, 1989	2.31	0.03	film	0.14	2.14	1.47	0.35	1.13	0.27	0.15	nfp	3.04	nfp
May 30, 1989	1.49	nfp	nfp	0.11	1.24	0.82	1.37	0.27	0.36	0.1	nfp	0.58	nfp
July 5, 1989	0.57	0.05	nfp	0.13	0.84	0.68	1.01	0.75	0.34	0.13	nfp	nfp	nfp
July 14, 1989	0.69	0.12	****	nfp	0.09	0.15	1.59	0.9	0.31	0.19	nfp	0.39	nfp
July 21, 1989	0.83	****	****	0.16	0.18	0.21	*1.02	0.85	0.27	0.15	nfp	0.28	nfp
July 28, 1989	0.87	****	****	0.1	0.17	0.14	0.8	0.27	0.3	0.18	nfp	0.37	nfp
August 4, 1989	0.4	****	****	0.1	nfp	0.06	0.29	0.05	nfp	**0.21	nfp	**0.5	nfp
August 11, 1989	**0.52	****	****	nfp	nfp	nfp	*,**0.47	nfp	nfp	0.26	nfp	0.35	nfp
August 18, 1989	0.29	****	****	0.18	nfp	0.09	0.36	0.18	nfp	****	nfp	0.1	nfp
August 28, 1989	0.56	****	****	0.06	nfp	0.09	0.89	0.11	nfp	0.18	nfp	0.41	nfp

nfp -- no floating product.
* being pumped during measurement.
** currently being pumped.
**** not accessible.

TABLE 1 (Continued)
PRODUCT THICKNESS MEASUREMENTS
CARNATION OAKLAND DAIRY FACILITY

Anania Geologic Engineering

DATE	PR-43	PR-44	PR-45	PR-46	PR-47	PR-48	PR-49	PR-50	PR-51	PR-52	PR-53	PR-54	PR-55
May 4, 1989	0.26	0.94	1.64	nfp	film	2.46	0.14	2.84	2.64	2.95	2.75	2.66	2.87
May 30, 1989	0.25	0.62	0.63	nfp	nfp	1.75	0.11	2.15	1.81	1.6	2.01	1.71	1.85
July 5, 1989	0.22	0.58	0.41	nfp	nfp	1.29	nfp	0.9	0.14	nfp	1.33	1.3	*1.11
July 14, 1989	0.15	0.61	0.55	nfp	nfp	0.31	nfp	*0.25	0.07	nfp	*0.34	1.08	nfp
July 21, 1989	0.21	0.56	0.27	nfp	nfp	0.53	nfp	0.35	0.55	0.08	0.4	*1.17	*1.14
July 28, 1989	0.3	0.34	0.23	nfp	nfp	0.93	nfp	0.48	0.58	0.12	0.43	1.46	0.54
August 4, 1989	0.27	0.32	0.39	nfp	nfp	*0.36	nfp	**0.55	*nfp	0.06	**,*0.61	**0.85	0.45
August 11, 1989	nfp	0.19	0.2	nfp	nfp	*0.35	nfp	*nfp	nfp	nfp	*nfp	**0.66	0.24
August 18, 1989	nfp	0.02	nfp	nfp	nfp	*,**1.02	nfp	0.66	0.15	0.12	**.94	*0.55	0.68
August 28, 1989	0.22	0.45	0.27	nfp	nfp	**0.33	nfp	0.11	0.49	0.15	**1.02	**1.00	0.83

DATE	PR-56	PR-57	PR-58	PR-59	PR-60	PR-61	PR-62	PR-63	PR-64	PR-65	PR-66	PR-67	PR-68
May 4, 1989	2.5	----	----	----	----	----	----	----	----	----	----	----	----
May 30, 1989	1.63	nfp	1.7	0.59	nfp	0.68	0.47	nfp	1.8	1.23	1.39	1.42	1.72
July 5, 1989	*1.15	nfp	1.73	*0.46	nfp	1.48	1.09	nfp	1.36	0.37	1.16	1.095	1.02
July 14, 1989	*1.37	nfp	nfp	nfp	nfp	1.49	0.06	nfp	1.37	nfp	nfp	0.07	nfp
July 21, 1989	0.3	nfp	nfp	nfp	nfp	0.85	*1.21	nfp	*1.21	nfp	nfp	0.06	nfp
July 28, 1989	0.29	nfp	nfp	nfp	nfp	1.04	0.3	nfp	1.08	nfp	nfp	0.15	0.17
August 4, 1989	**,*0.5	nfp	nfp	nfp	nfp	*nfp	nfp	nfp	**,*0.52	nfp	nfp	0.28	0.4
August 11, 1989	*,**0.65	nfp	nfp	nfp	nfp	0.13	nfp	nfp	*,**0.67	nfp	nfp	0.11	nfp
August 18, 1989	*0.55	nfp	nfp	nfp	nfp	0.18	0.29	nfp	*0.53	nfp	nfp	0.23	0.28
August 28, 1989	0.68	nfp	nfp	nfp	nfp	0.59	0.29	nfp	**1.09	nfp	nfp	0.29	0.34

nfp -- no floating product.
* being pumped during measurement.
** currently being pumped.
**** not accessible.

TABLE 1 (Continued)
PRODUCT THICKNESS MEASUREMENTS
CARNATION OAKLAND DAIRY FACILITY

Anania Geologic Engineering

DATE	PR-69	PR-70	PR-71	PR-72	PR-73	PR-74	PR-75	PR-76	PR-77	MW-78	MW-79	MW-80	MW-81
May 30, 1989	nfp	0.03	2.22	2.28	nfp	nfp	nfp	nfp	nfp	----	----	----	----
July 5, 1989	nfp	nfp	1.86	1.81	nfp	nfp	nfp	nfp	nfp	----	----	----	----
July 14, 1989	nfp	nfp	****	****	****	nfp	nfp	nfp	nfp	----	----	----	----
July 21, 1989	nfp	nfp	****	****	****	nfp	nfp	nfp	nfp	----	----	----	----
July 28, 1989	nfp	nfp	****	****	****	nfp	nfp	nfp	nfp	----	----	----	----
August 4, 1989	nfp	nfp	****	****	****	nfp	nfp	nfp	nfp	nfp	nfp	nfp	nfp
August 11, 1989	nfp	nfp	****	****	****	nfp	nfp	nfp	nfp	****	****	****	****
August 18, 1989	nfp	nfp	****	****	****	nfp	nfp	nfp	nfp	****	****	****	****
August 28, 1989	nfp	nfp	****	1.43	****	nfp	nfp	nfp	nfp	****	****	****	****

DATE	MW-85	MW-86	MW-87	MW-88	MW-89	MW-6	MW-7	MW-8	MW-22	MW-23	MW-24
March 8, 1989	----	----	----	----	----	nfp	1.18	1.97	----	----	----
May 4, 1989	----	----	----	----	----	nfp	2.54	3.35	----	----	----
May 30, 1989	----	----	----	----	----	nfp	1.39	2.55	----	----	----
July 5, 1989	----	----	----	----	----	nfp	1.49	1.81	----	----	----
July 14, 1989	----	----	----	----	----	nfp	1.84	2.54	----	----	----
July 21, 1989	----	----	----	----	----	nfp	1.34	2.38	----	----	----
July 28, 1989	----	----	----	----	----	nfp	1.31	2.33	----	----	----
August 4, 1989	----	----	----	----	----	nfp	1.34	2.35	----	----	----
August 11, 1989	----	----	----	----	----	nfp	nfp	nfp	----	----	----
August 18, 1989	----	----	----	----	----	nfp	1.52	1.22	1.81	1.16	nfp
August 28, 1989	----	----	----	----	----	nfp	1.5	2.08	****	****	****

nfp -- no floating product.
* being pumped during measurement.
** currently being pumped.
**** not accessible.

PRODUCT RECOVERED (Figure 10)

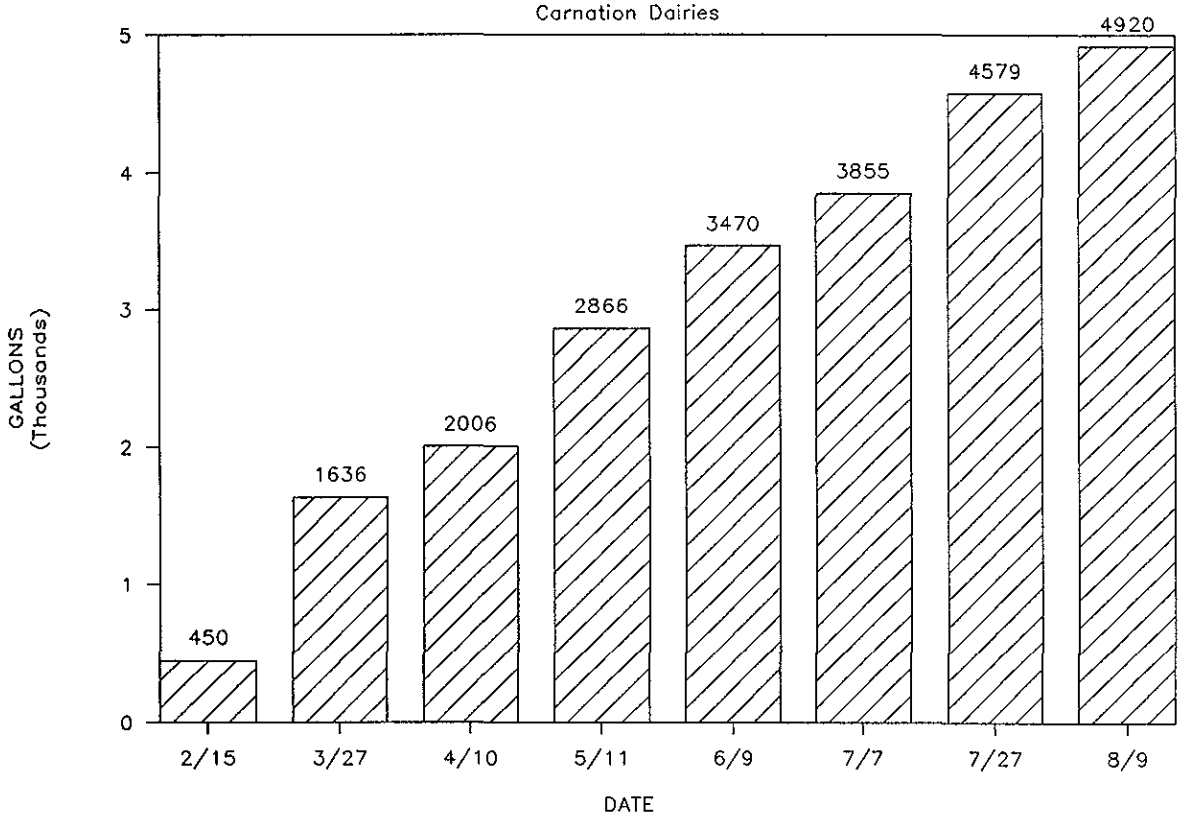
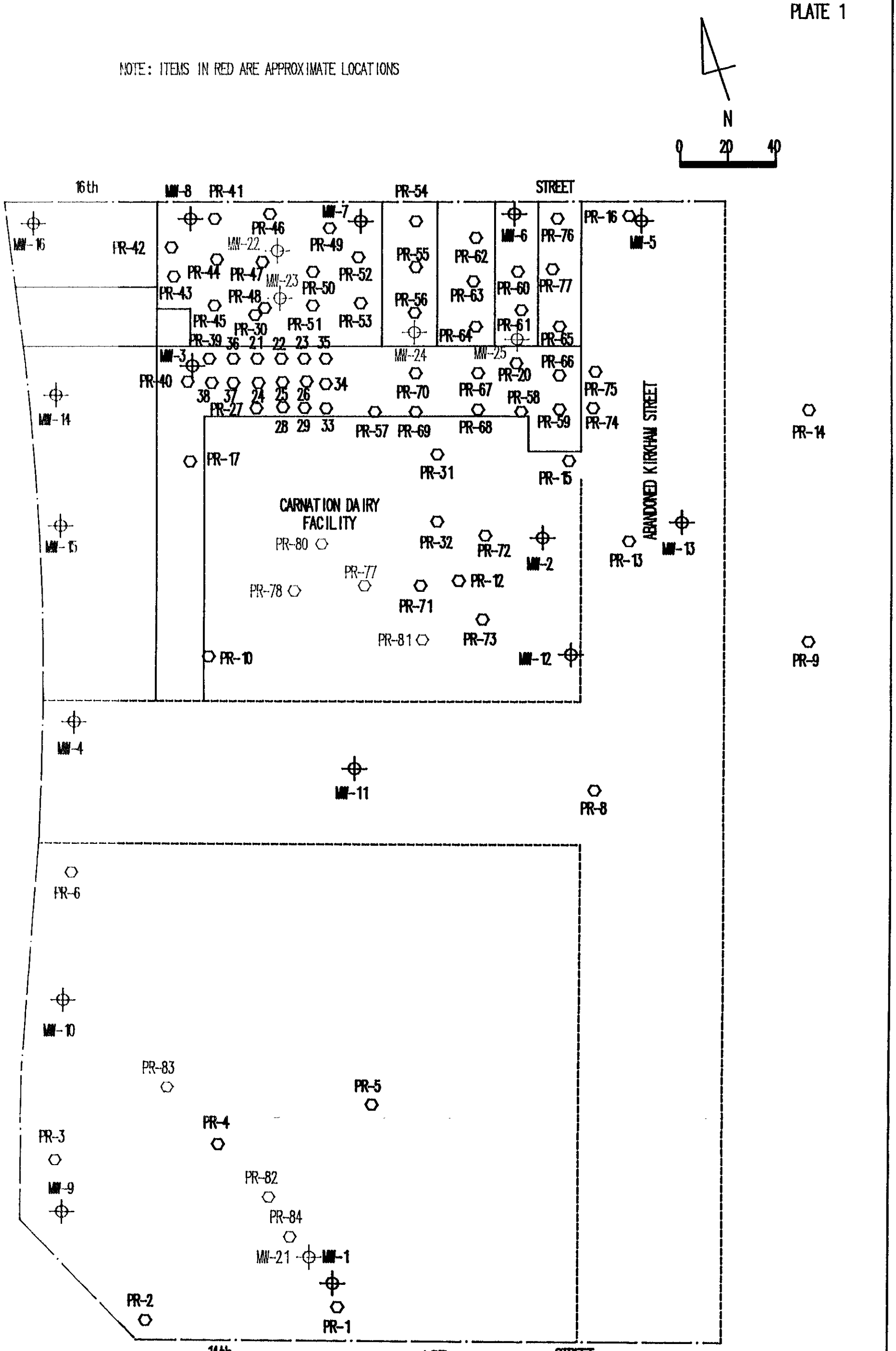


PLATE 1

NOTE: ITEMS IN RED ARE APPROXIMATE LOCATIONS



ANANIA GEOLOGIC ENGINEERING

TITLE: MONITORING WELL AND PRODUCT RECOVERY WELL LOCATIONS		
PROJECT NAME: CARNATION/OAKLAND		PROJECT NO: 004-88-059
SITE LOCATION: 1310 14th ST. AT POPLAR OAKLAND, CA.		
DATE: 10-9-89	DRAWING NO.: 059-030	SCALE: 1" = 40'

2.5 Excavated Soil Bioremediation

A total of 1,200 cubic yards of contaminated soil was excavated during the tank removal phase and spread out on site for remediation. The goal of the bioremediation process was to reduce gasoline and diesel TPH concentrations to levels below 100 ppm which are considered non-hazardous and are acceptable for disposal at Class III landfills. At specific times the soil pile was seeded with a solution of bacteria. A total of four microbial seedings were made between April 14, 1989 and August 12, 1989. To ensure optimum microbial activity, the soil moisture was maintained between 20 and 80% saturation. The soil was piled to a height of approximately two feet and kept covered until the TPH concentrations as gasoline in the soil were reduced to a concentration of less than 10 ppm. At that time, the soil pile was separated and approximately two-thirds of the pile was spread out in a one foot lift. The remainder was stockpiled and covered. The redistributed soil was periodically tilled to mix the bacteria, kept moist, and seeded with additional microorganisms. Care was taken to contain the contaminated soil with a berm to prevent runoff. Additionally, the surface drains in the remediation area were plugged so that soil or water would not enter the storm drains or sewer system.

Figures 11 and 12 show the progressive decrease in the TPH and benzene, toluene, ethylbenzene and xylene (BTEX) concentrations of the first 900 cubic yards of soil treated from March to August of 1989. Results from the last sampling event on August 1, 1989 verified the TPH concentrations were reduced to below 100 ppm and the soil could be sent to a Class III landfill. On August 16, 1989, 900 cubic yards of soil were hauled to the Richmond Sanitary Landfill. Laboratory reports and Chain of Custody forms for the analyses are included in Appendix C.

The remaining 300 to 400 yards of soil were spread out in a one foot lift in August. The soil is being treated in the same manner as described for the first 900 cubic yards. AGE anticipates that the remainder of the soil will be ready to be removed from the site by early October 1989.

2.6 Vapor Extraction

Vapor extraction will be used to remediate on-site vadose zone soils. Several shallow extraction wells will be installed to draw vapors from the subsurface. The exact locations and design parameters of these wells shall be submitted in a subsequent report. Hydrocarbon vapors will be burned using an internal combustion engine. The engine is equipped with auxiliary propane injection if the quantity of gasoline vapor is not sufficient to

continually run the motor. The system will be permitted through the Bay Area Air Quality Management District in San Francisco.

A pilot test is scheduled for early October 1989. The pilot test will be performed to determine the effectiveness of the system in extracting hydrocarbon vapors from the vadose zone, and to monitor the emissions of hydrocarbons and lead released to the atmosphere. Tetlar bags will be used to collect samples to be analyzed for TPH as gas and diesel and BTEX. Lead samples will be collected on cellulose esther filters and analyzed by the NIOSH method 7300.

2.7 Groundwater Extraction and Treatment

AGE is currently working on the design and permit for the implementation of a groundwater extraction and treatment system. In previous meetings with the Alameda County Health Department, it was stated that approval for the implementation of a groundwater extraction and treatment system would be granted if the plume had not migrated beyond 16th street, north of the property. Preliminary findings suggest that the free product plume does not extend as far north as 16th street. AGE will apply for a permit from East Bay Municipal Utility District (EBMUD) to discharge the treated groundwater to the sanitary sewer.

3.0 SITE CHARACTERIZATION

Since March 1989, 84 product recovery probes and 25 monitoring wells have been installed at the Oakland Facility. The wells were installed to characterize the hydrogeologic conditions at the site and to assess the horizontal extent of the gasoline and diesel contaminant plumes outlined in the Preliminary Site Characterization Report. Product recovery probes have been used to recover free product from both the gasoline and diesel contaminant plumes. A site plan showing the surveyed locations of the monitoring wells and product recovery probes is presented on Plate 1. Boring logs of product recovery probes PR-1 through PR-81 are presented in Appendix B. Revised boring logs for monitoring wells MW-1 through MW-16 are included in Appendix D. Boring logs for monitoring wells MW-17 through MW-20 will be submitted in the closure plan for the abandonment of the two on-site boiler fuel tanks. Boring logs for monitoring well MW-21 and piezometers PR-82 through PR-84 will be presented in the Aquifer Test Report. Boring logs for MW-22 through MW-24 will be included in the next quarterly monitoring report.

FIGURE 11

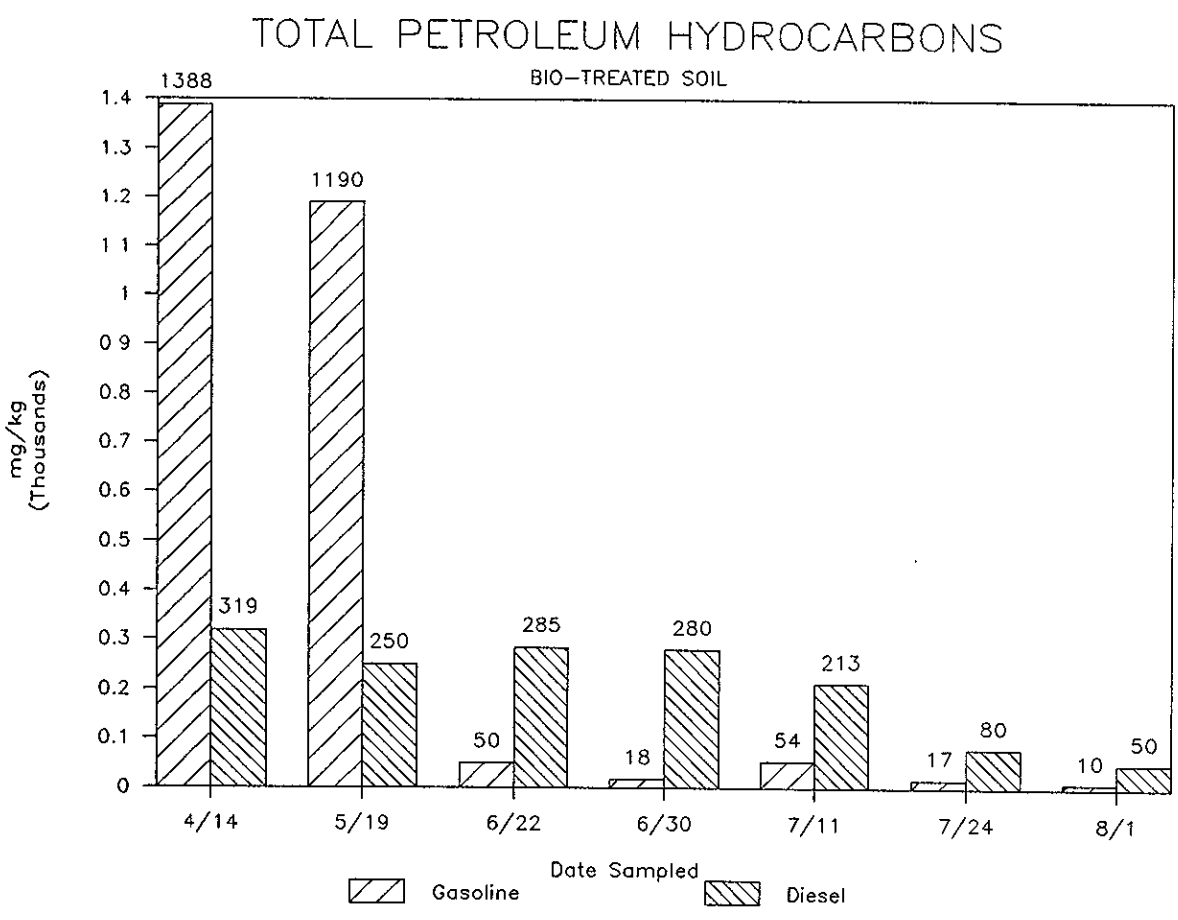
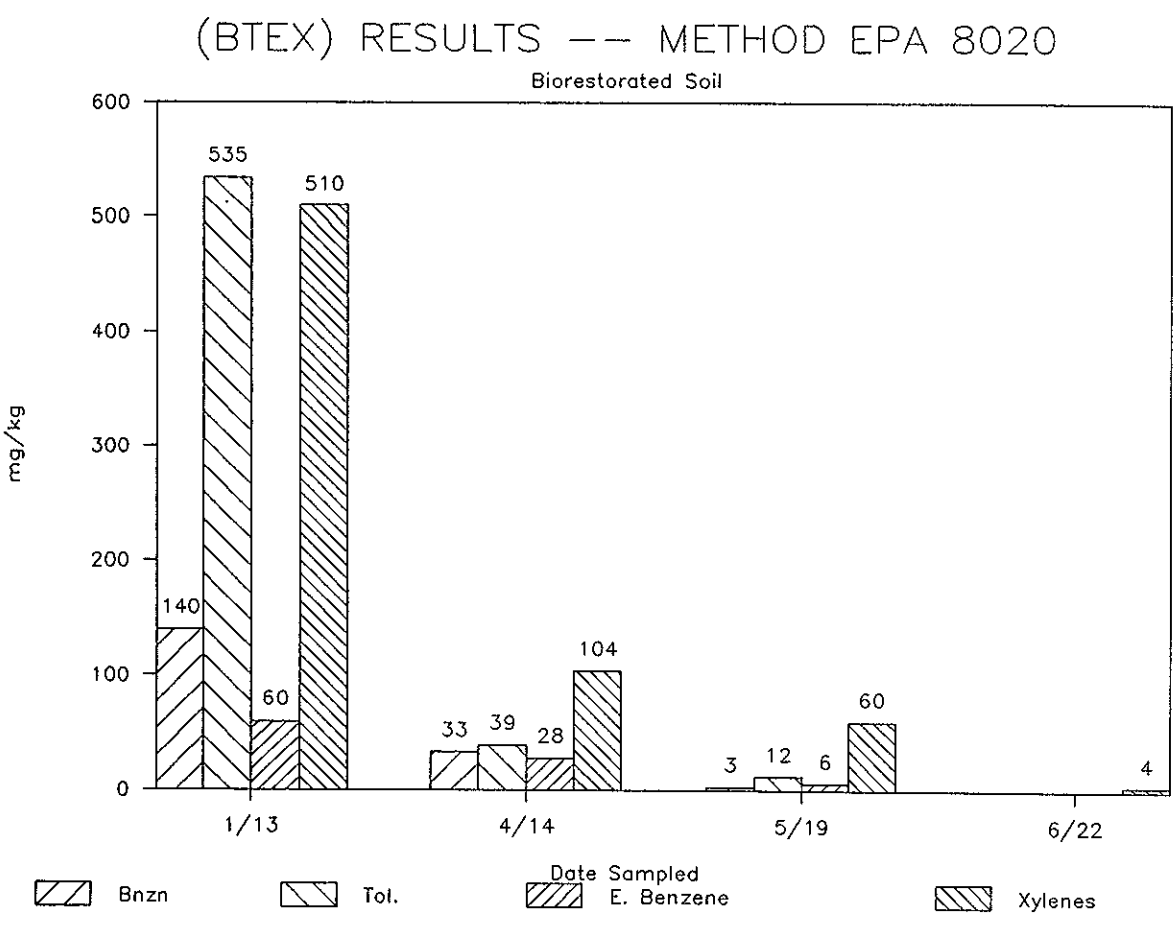

TOTAL PETROLEUM HYDROCARBONS
BIO-TREATED SOIL
mg/kg
(Thousands)
1.4
1.3
1.2
1.1
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
1388
319
1190
250
50
285
18
280
54
213
17
80
10
50
4/14
5/19
6/22
6/30
7/11
7/24
8/1
Date Sampled
Gasoline
Diesel

FIGURE 12


(BTEX) RESULTS -- METHOD EPA 8020
Biorestorated Soil
mg/kg
600
500
400
300
200
100
0
535
510
140
60
33
39
28
104
3
12
6
60
4
1/13
4/14
5/19
6/22
Date Sampled
Bnzn
Tol.
E. Benzene
Xylenes

3.1 On Site Investigation

Initially, 16 monitoring wells and 40 product recovery probes were installed. The monitoring wells were located around the fuel tank excavation area and along the perimeter of the property to assess the extent of the contaminant plume. The product recovery probes were installed in areas thought to contain free product in order to expedite free product recovery and to enhance in situ bioremediation.

As additional information was gathered on the extent of contamination, more product recovery probes and monitoring wells were installed. The monitoring wells were installed for several reasons. Monitoring well MW-21 was specifically installed to perform an aquifer test on the unconfined aquifer beneath the site in the Merritt Sand Formation. Monitoring wells MW-22 through MW-24 were drilled in locations considered important for establishing groundwater contaminant concentrations in the area of the gasoline plume and to monitor corrective action. Product recovery probes PR-82 through PR-84 were installed as piezometers for the aquifer test. Other product recovery probes were installed to remove free product and to act as injection points for the microorganisms and air.

All borings were drilled with a truck mounted drill rig equipped with hollow-stem augers. Augers and sampling equipment were steam cleaned prior to drilling. No soaps or phosphates were used for decontamination. Cuttings and spoils from the borings were incorporated into the on-site stockpile of soil for bio-treatment. Continuous air monitoring was conducted during drilling using a Bacharach TLV sniffer. A boring log of the subsurface conditions was maintained by a project geologist.

Representative soil samples were collected at intervals of no greater than five feet in each monitoring well. The samples were collected using a Modified California split-spoon sampler lined with brass sleeves. The sampler was driven into the soil by a 140 pound hammer dropped 30-inches. Samples were sealed with foil, capped, labelled with a sample tag indicating sample number, project number, sampler, date, time, location and depth, taped, and sent to Precision Analytical Laboratories under Chain of Custody for analysis.

Product recovery probes are two inches in diameter and 15 feet deep. The diameter and depth of each monitoring well varies. Monitoring wells augered inside the shop building are two inches in diameter and 25 feet deep. Those outside the building are four inches in diameter and 25 feet deep with the exception of MW-1, MW-4, and MW-21. MW-1 and MW-4 were drilled to 50 feet to

continuously sample and log the lithology and stratigraphy of the Merritt Sand Formation. MW-21 was augered to 57 feet to establish the total thickness of the aquifer at the site. Boring logs including well construction details for monitoring wells MW-1 through MW-16 are included on the boring logs in Appendix D.

3.2 Off Site Exploration

To evaluate possible lateral and vertical migration of fuel contamination in the soil and groundwater north of the Facility, five monitoring wells were installed in 16th Street. The off-site monitoring wells were installed to confirm or deny the presence of free product and/or dissolved gasoline constituents as far north as 16th Street. AGE had established the presence of free product up to the northern boundary of the property.

Preliminary results indicate that the free product plume has not migrated to 16th Street. At this time, all five wells do not have free product floating on the groundwater. Since the wells were recently installed, conclusions about the extent of the free product plume and groundwater and/or contamination off site will be withheld until the wells have been developed and properly sampled. Boring logs, soil sample analytical results, and groundwater sample results will be included in the next summary report.

3.3 Aquifer Test

On July 20, 1989, AGE performed a 24-hour continuous drawdown pump test to define the aquifer characteristics at the Oakland Facility. The purpose of the pump test was to collect time and drawdown data to calculate the hydraulic conductivity and transmissivity of the aquifer. By evaluating the aquifer characteristics, estimates of groundwater velocity, aquifer storage, and transmissivity may be made to help establish the extent of contamination and set parameters for a groundwater extraction system.

During the test, groundwater was pumped from monitoring well MW-21 at a rate of approximately 16 gallons per minute (gpm). The pump test was terminated after 12 hours and a 12 hour recovery test was conducted. Monitoring well MW-21 and piezometers PR-82, PR-4, PR-83, and PR-84 were continually monitored during the drawdown and recovery phases of the test. The water was contained on-site in a Baker tank. Samples from the Baker tank were collected and submitted for chemical analyses. Results of the TPH, BTEX, oil and grease and total lead analyses using methods Modified 8015, 8080, 8010, 503E and 6010 were reported as below detection limits for the constituents. Additional samples will be collected for analysis by EPA methods 8240, 8270 and priority pollutant metals. A waiver

to discharge the pump test water from the RWQCB or EBMUD does not appear likely to be granted in a timely manner. Pending the analytical results for the priority pollutants, the water will probably be reclaimed and used for washing trucks or other activities at the Carnation Facility. The analytical results and Chain of Custody forms for all samples collected from the pump test will be included in the aquifer test report.

Aquifer test results are not presented in this report. A separate report is being written and is forthcoming. Preliminary results indicate that there is a relatively good aquifer present with an estimated hydraulic conductivity of 10^{-3} centimeters per second (cm/sec).

4.0 SITE CHARACTERIZATION RESULTS

4.1 Plume Definition

Two distinct plumes are present at the Facility. The larger plume has been identified as a mixture of 90 to 96% gasoline and the remainder diesel. It is directly below the shop building extending as far east as PR-74, PR-75, PR-77, and MW-6; as far west as PR-40, PR-42, and PR-43; and as far south as PR-27, PR-57 and PR-74. Preliminary results suggest that the northern extent of this plume lies between the northern wall of the shop building and the southern curb of 16th street.

An approximate location of the smaller diesel plume has also been identified. This plume occurs entirely on the property and has been identified around the southern and eastern borders of the fuel tank excavation area. Chemically this plume is quite different than the larger plume below the shop building, suggesting the possibility of another source of contamination at the site. Additional investigative work has been done in soils and groundwater in this plume, however, details concerning the investigation and remediation of this plume shall be presented in a separate document.

4.2 Groundwater Elevation and Gradient

Prior to groundwater sampling, the groundwater level is measured in each monitoring well. Table 2 shows the groundwater elevations measured to date. The groundwater elevations beneath the site have continually dropped throughout the dry summer season. Groundwater elevation contour maps are shown in Figures 13 through 16. The June contour map and the two July maps indicate that groundwater flows north to northwest with a hydraulic gradient of 0.001 and 0.002. Regionally, groundwater flows to the west. However, site

TABLE 2
GROUNDWATER ELEVATIONS
CARNATION OAKLAND DAIRY FACILITY

ANANIA GEOLOGIC ENGINEERING

	MONITORING WELL NUMBER									
	MW-1	MW-2	MW-3	MW-4	MW-5	MW-6	MW-7	MW-8	MW-9	MW-10
TOC Elevation	16.49	15.11	14.3	14.42	14.41	14.12	14.29	14.2	14.96	15.73
April 25, 1989	5.55	6.36	****	6.29	6.16	6.07	****	****	6.4	6.41
June 7, 1989	5.89	5.57	****	5.57	5.41	****	****	****	5.68	5.69
July 5, 1989	5.54	5.26	4.22	5.37	5.06	****	****	****	----	5.28
July 31, 1989	5.28	----	4.75	4.92	4.82	4.89	****	****	----	5.08

	MONITORING WELL NUMBER									
	MW-11	MW-12	MW-13	MW-14	MW-15	MW-16	MW-17	MW-18	MW-19	MW-20
TOC Elevation	14.55	15.28	14.85	14.1	14.17	14.11	16.48	16.11	16.29	16.39
April 25, 1989	6.45	6.45	6.38	----	6.13	5.89	++++	++++	++++	++++
June 7, 1989	5.7	5.68	5.61	5.36	5.44	5.21	6.15	5.96	5.94	5.98
July 5, 1989	3.72	5.28	5.3	4.82	5.09	4.83	----	5.71	----	5.59
July 31, 1989	5.07	5.14	5.02	4.68	4.73	4.59	5.47	5.36	6.54	5.31

**** not measured beacuse well contains free product.
---- not accessible.
++++ not installed.
==== being abandoned.

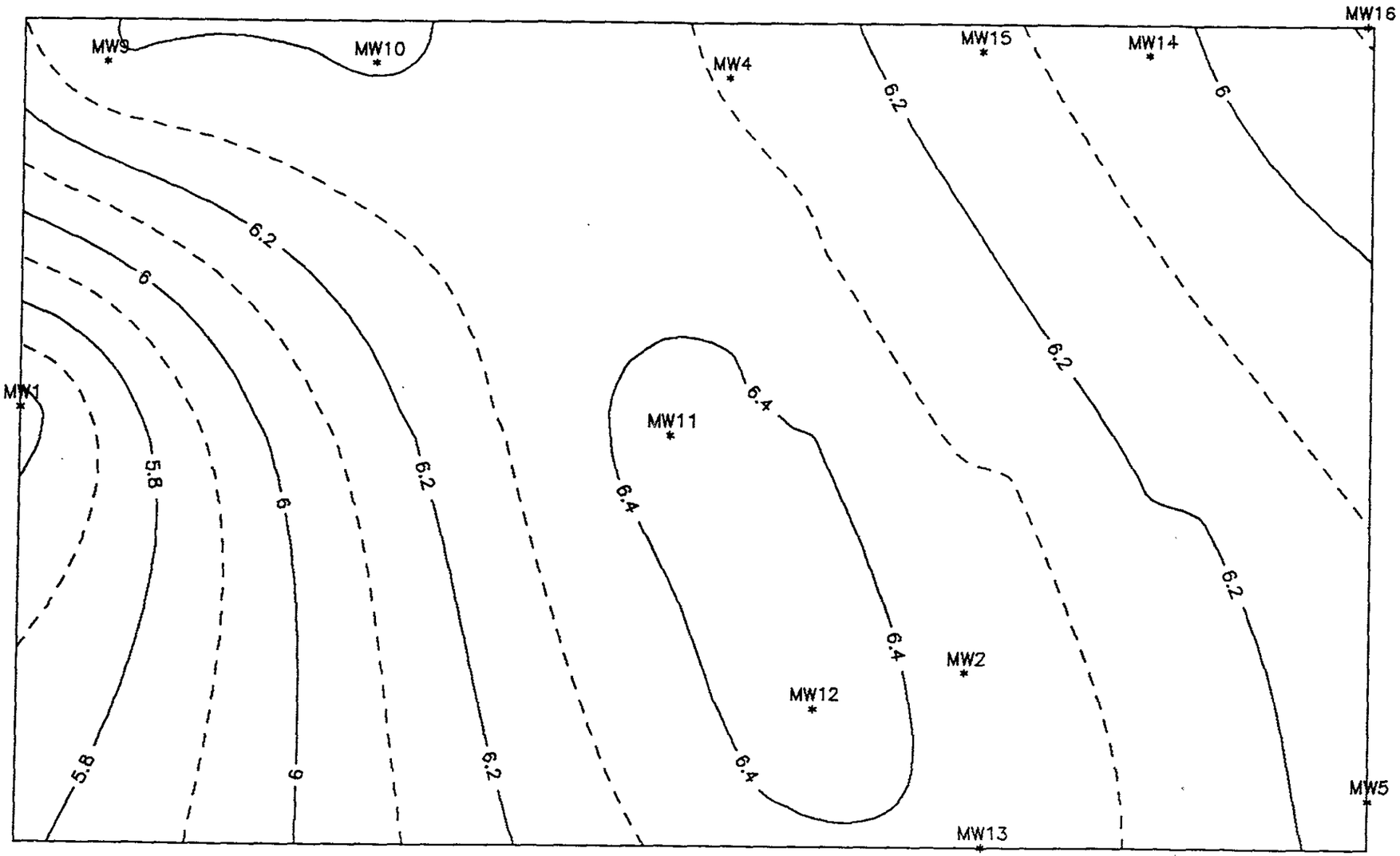
Table 3: Soil Analytical Results
Total Petroleum Hydrocarbons (EPA Modified 8015)
BTEX (EPA 8080)
Total Lead Soluble Lead (EPA 6010)

Sample Number	Depth Below Ground Surface	TPH-Gasoline	TPH-Diesel	Benzene	Toluene	Ethyl-benzene	Xylenes	Total Lead	Soluble Lead
	Limit of Detection	10 mg/kg	10 mg/kg	0.03 mg/kg	0.03 mg/kg	0.03 mg/kg	0.03 mg/kg	1.1 mg/kg	0.044 mg/kg
4137 (PR-71)	5	100	74	1.0	1.6	1.20	10.00	1.6	0.38
4138 (PR-71)	10	ND<10	ND<10	0.10	0.10	ND<0.03	0.16	1.8	0.16
4139 (PR-71)	15	320	50	9.0	28.0	6.7	50	ND<1.1	0.17
4145 (PR-72)	5	ND<10	ND<10	0.03	ND<0.03	ND<0.03	0.15	2.1	0.56
4146 (PR-72)	10	1021	140	137	450	110	870	9.7	2.6
4147 (PR-72)	15	ND<10	ND<10	0.92	0.33	0.08	0.44	1.3	0.38
4141 (PR-73)	5	ND<10	ND<10	ND<0.03	ND<0.03	ND<0.03	0.04	3.1	0.16
4142 (PR-73)	10	ND<10	ND<10	ND<0.03	ND<0.03	ND<0.03	0.03	1.2	0.18
4143 (PR-73)	15	ND<10	ND<10	ND<0.03	ND<0.03	ND<0.03	0.04	4.2	0.44

ND - Not Detected

FIGURE 13

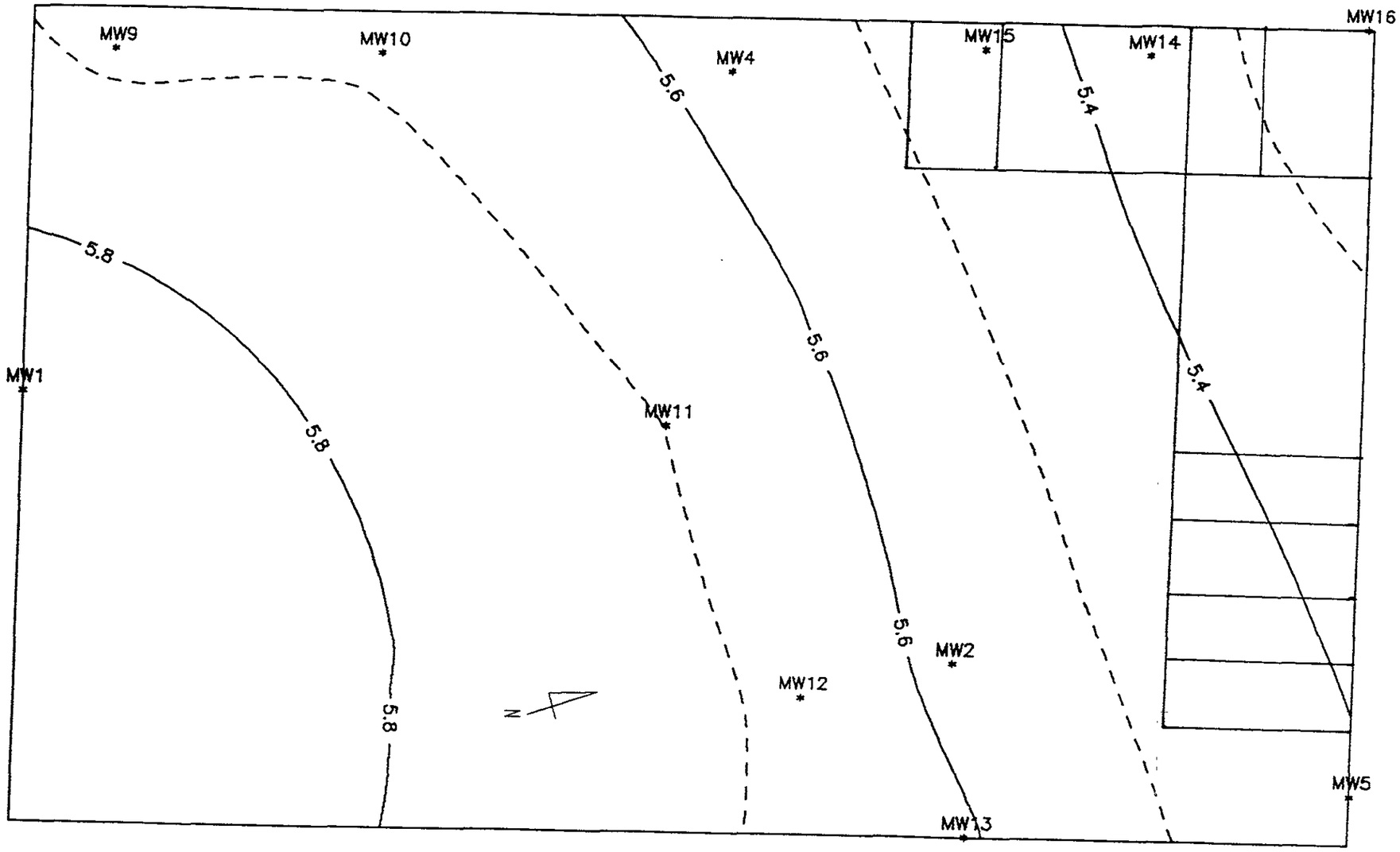
GROUNDWATER ELEVATION (APRIL 25, 1989)



SCALE 1 inch = 40 FEET

FIGURE 14

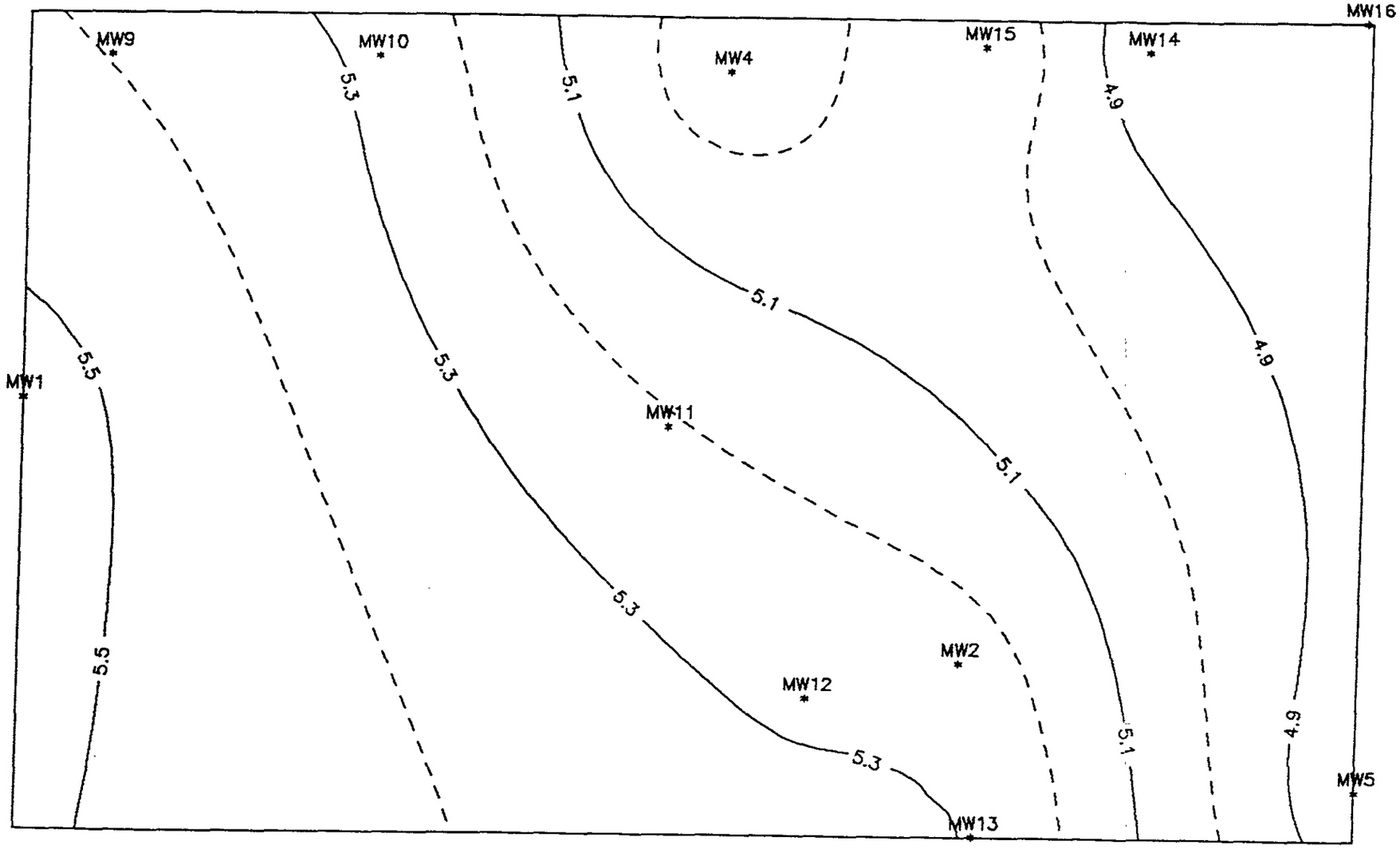
GROUNDWATER ELEVATION (JUNE 7, 1989)



SCALE 1 inch = 40 FEET

FIGURE 15

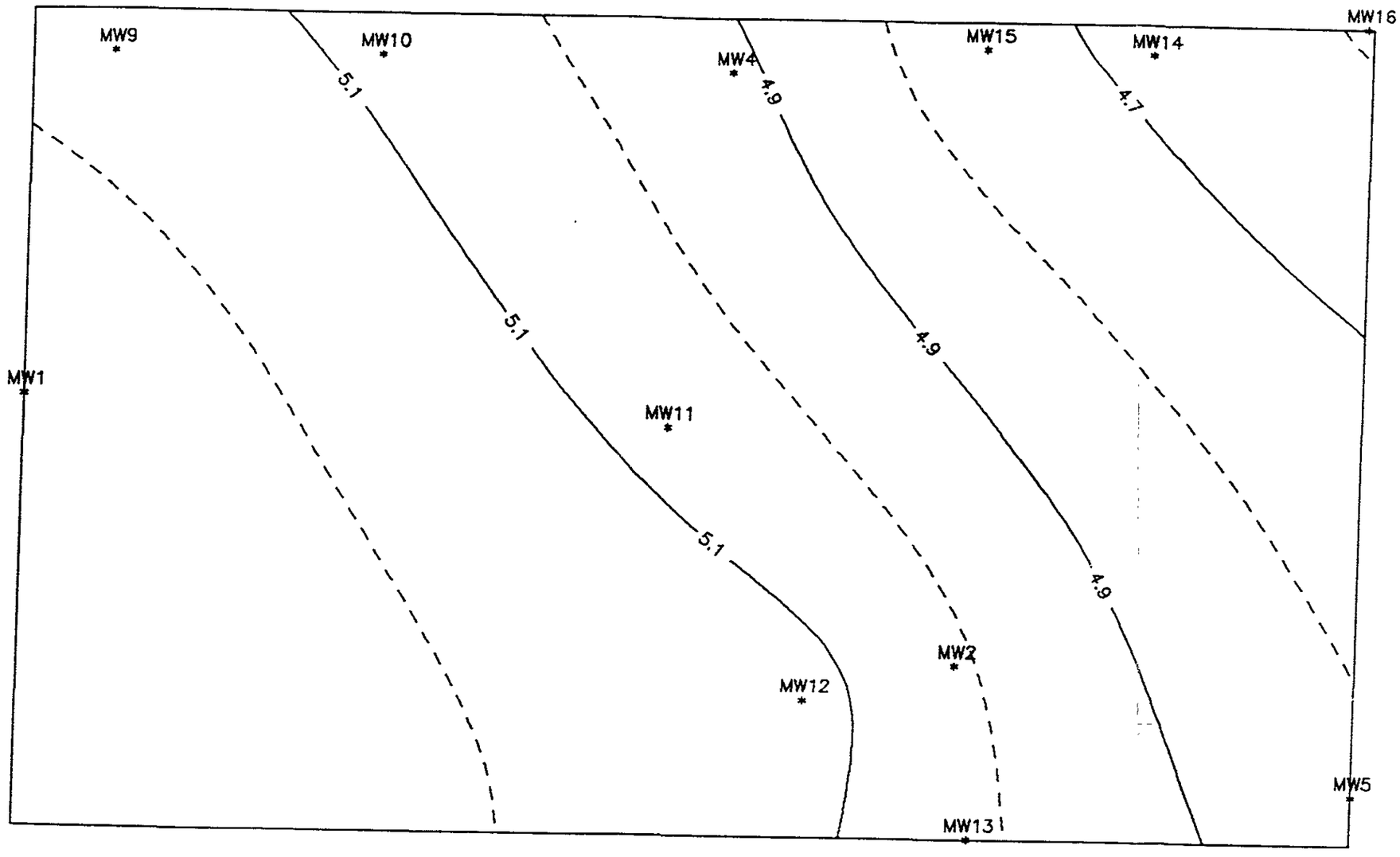
GROUNDWATER ELEVATION (JULY 5, 1989)



SCALE 1 inch = 40 FEET

FIGURE 16

GROUNDWATER ELEVATION (JULY 31, 1989)



SCALE 1 inch = 40 FEET

specific groundwater flow can differ from regional groundwater flow. Local geologic differences in an aquifer and underground utilities may alter the flow of groundwater in urban areas. Variations in groundwater elevations and flow directions will be monitored by continuing to measure groundwater elevations monthly for the remainder of the year.

4.3 Soil Samples

Analytical results of soil samples collected during the installation of monitoring wells MW-1 through MW-16 were included in the Preliminary Site Characterization Report. Results of soil sampling obtained from additional monitoring wells installed at the facility are not included in this report. The results obtained from monitoring wells MW-17 through MW-20 will be included in the closure plan for the abandonment of the boiler fuel tanks. Soil samples collected from MW-21 will be presented in the Aquifer Test Report. Analytical results of soil samples collected from MW-22 through MW-24 are being reviewed for accuracy and will be included in the next summary report.

Soil samples were collected during the installation of the product recovery probes PR-71, PR-72 and PR-73. Soil sample results from PR-71 through PR-73 are shown in Table 3. Laboratory results and respective Chain of Custody forms are presented in Appendix E.

Laboratory results indicate that soil is contaminated with TPH and BTEX in the vicinity of PR-71 and PR-72. However, soil samples from PR-73 were not contaminated. Soil collected from PR-71 was contaminated at five and fifteen feet below grade and relatively clean at ten feet below ground surface. At five feet, soil contained approximately equal concentrations of gasoline and diesel. At fifteen feet, nearly seven times more diesel was detected than gasoline. Soil collected from PR-72 was found to be contaminated mainly with gasoline at only ten feet below grade.

Because the water table on site lies approximately 10 feet below surface grade, contamination detected at ten feet in PR-72 suggests the presence of free product. In fact, free product was detected in PR-72 after the well was completed. The gasoline and diesel detected at fifteen feet may have been in the water and not necessarily in the soil. Concentrations of contaminants detected in a soil sample collected below the water table is not necessarily representative of the soil contamination due to the possible flushing of the soil with the groundwater.

4.4 Groundwater Samples

Standard sampling protocol for this site includes collecting

groundwater samples from on-site monitoring wells that do not contain free product monthly for the first three months and quarterly for the first year. Groundwater collected taken from monitoring wells MW-1, MW-2, MW-4, MW-5 and MW-9 through MW-16 are analyzed for TPH as gasoline and diesel, BTEX and total lead by EPA methods modified 8015, 8020, and 6010. Selected samples from monitoring wells MW-5, MW-10, MW-13, MW-15, and MW-16 were analyzed for volatile and semi-volatile organics and total oil and grease by EPA methods 8240, 8270, 503A and 503E. Monitoring wells MW-3, MW-6, MW-7, and MW-8 will not be sampled until the free product is removed.

Analytical results for the first sampling event are presented in the Preliminary Site Characterization Report, dated April 3, 1989. Analytical results for the April 27 and June 7, 1989 sampling events are shown in Tables 4 through 8. Laboratory reports and respective Chain of Custody forms are included in Appendix F. Analytical results of TPH, BTEX, and total lead analyses for the April 27th sampling round indicate the absence of hydrocarbons constituents (Table 4). Monitoring well MW-2 was not sampled because the well was not accessible on the day of sampling. Results of the 8240 and 8270 analyses indicate the absence of benzene, toluene, ethylbenzene, and total xylenes. However, bis-(2-ethylhexyl)phthalate and di-n-butylphthalate were detected. Results are shown in Table 5.

Bis-(2-ethylhexyl)phthalate and di-n-butylphthalate are commonly used as an additive in milk cartons and dairy containers to harden the plastic container. They give the cartons that characteristic waxy look and feel. Since this property has been operating as a dairy facility for nearly 60 years, it is not unusual for these chemicals to be present. Another interesting characteristic of these two substances is that they degrade rapidly in groundwater. This may account for their absence in the groundwater samples collected on June 7, 1989 (Table 6).

Table 6 also shows that 6 parts per billion (ppb) of methylene chloride was detected in monitoring well MW-5. AGE believes methylene chloride could be a laboratory contaminant. It is commonly used in laboratory analyses to quantify the amount of hydrocarbons present in water and soil. AGE shall continue to analyze for this constituent to verify laboratory contamination.

Table 7 shows the results of BTEX and total lead analyses of groundwater samples collected on June 7, 1989. Volatile hydrocarbons and total lead were not detected. Groundwater analytical results for samples analyzed for TPH and total oil and grease on June 7, 1989 also show the absence of hydrocarbon constituents (Table 8).

Table 4: Groundwater Analytical Results
EPA Methods Modified 8015, 8020 and 6010
Groundwater Samples Taken on 4/27/89

Sample Number	Location	TPH-Gasoline	TPH-Diesel	Benzene	Toluene	Ethyl-benzene	Xylenes	Lead
	Limit of Detection	0.5 mg/l	0.5 mg/l	0.3 µg/l	0.3 µg/l	0.3 µg/l	0.3 µg/l	0.044 mg/l
3627	MW-1	ND<0.5	ND<0.5	ND<0.3	ND<0.3	ND<0.3	ND<0.3	ND<0.044
3828	MW-4	ND<0.5	ND<0.5	ND<0.3	ND<0.3	ND<0.3	ND<0.3	ND<0.044
3901	MW-5	ND<0.5	ND<0.5	ND<0.3	ND<0.3	ND<0.3	ND<0.3	ND<0.044
3822	MW-9	ND<0.5	ND<0.5	ND<0.3	ND<0.3	ND<0.3	ND<0.3	ND<0.044
3774	MW-10	ND<0.5	ND<0.5	ND<0.3	ND<0.3	ND<0.3	ND<0.3	ND<0.044
3781	MW-11	ND<0.5	ND<0.5	ND<0.3	ND<0.3	ND<0.3	ND<0.3	ND<0.044
3778	MW-12	ND<0.5	ND<0.5	ND<0.3	ND<0.3	ND<0.3	ND<0.3	ND<0.044
3771	MW-13	ND<0.5	ND<0.5	ND<0.3	ND<0.3	ND<0.3	ND<0.3	ND<0.044
3624	MW-14	ND<0.5	ND<0.5	ND<0.3	ND<0.3	ND<0.3	ND<0.3	ND<0.044
3621	MW-15	ND<0.5	ND<0.5	ND<0.3	ND<0.3	ND<0.3	ND<0.3	ND<0.044
3825	MW-16	ND<0.5	ND<0.5	ND<0.3	ND<0.3	ND<0.3	ND<0.3	ND<0.044
3905	Duplicate MW-5	ND<0.5	ND<0.5	ND<0.3	ND<0.3	ND<0.3	ND<0.3	ND<0.044
3912	Duplicate MW-10	ND<0.5	ND<0.5	ND<0.3	ND<0.3	ND<0.3	ND<0.3	ND<0.044

ND - Not Detected

Table 5: Summary of Detected Constituents in Groundwater from EPA Methods 8240 and 8270 Groundwater Samples Taken on 4/27/89

Location	Benzene	Toluene	Ethyl-benzene	Xylenes	bis-(2-ethylhexyl) phthalate	di-n-butylphthalate
Limit of Detection	2 µg/l	2 µg/l	2 µg/l	3 µg/l	10 µg/l	1 µg/l
MW-5	ND	ND	ND	ND	ND	2
MW-10	ND	ND	ND	ND	80	ND
MW-13	ND	ND	ND	ND	ND	ND
MW-15	ND	ND	ND	ND	20	ND
MW-16	ND	ND	ND	ND	150	ND

ND - Not Detected

Table 6: Summary of Detected Constituents In Groundwater
EPA Methods 8240 and 8270
Groundwater Samples Taken on 6/7/89

Sample Number	Location	Benzene	Toluene	Ethyl-benzene	Xylene	bis-(2-ethylhexl) phthalate	di-n-butylphthalate	Methylene chloride
	Limit of Detection	5 µg/l	5 µg/l	5 µg/l	5 µg/l	10 µg/l	10 µg/l	5 µg/l
4151	MW-5	ND	ND	ND	ND	ND	ND	ND
4157	MW-10	ND	ND	ND	ND	ND	ND	ND
3209	MW-13	ND	ND	ND	ND	ND	ND	ND
4174	MW-15	ND	ND	ND	ND	ND	ND	6
3197	MW-16	ND	ND	ND	ND	ND	ND	ND

ND - Not Detected

Table 7: Summary Groundwater Analytical Results
EPA Methods 8020 and 6010
Groundwater Samples Taken on 6/7/89

Sample Number	Location	Benzene	Toluene	Ethyl-benzene	Xylene	Lead
	Limit of Detection	0.3 µg/l	0.3 µg/l	0.3 µg/l	0.3 µg/l	0.044 mg/l
4149	MW-1	ND<0.3	ND<0.3	ND<0.3	ND<0.3	ND<0.044
3225	MW-2	ND<0.3	ND<0.3	ND<0.3	ND<0.3	ND<0.044
4150	MW-4	ND<0.3	ND<0.3	ND<0.3	ND<0.3	ND<0.044
4152	MW-9	ND<0.3	ND<0.3	ND<0.3	ND<0.3	ND<0.044
4157	MW-10	ND<0.3	ND<0.3	ND<0.3	ND<0.3	ND<0.044
4164	MW-11	ND<0.3	ND<0.3	ND<0.3	ND<0.3	ND<0.044
3205	MW-12	ND<0.3	ND<0.3	ND<0.3	ND<0.3	ND<0.044
4181	MW-14	ND<0.3	ND<0.3	ND<0.3	ND<0.3	ND<0.044
4169	Duplicate MW-4	ND<0.3	ND<0.3	ND<0.3	ND<0.3	ND<0.044
4189	Duplicate MW-14	ND<0.3	ND<0.3	ND<0.3	ND<0.3	ND<0.044

ND - Not Detected

Table 8: Summary Groundwater Analytical Results
EPA Methods Modified 8015, 5030D and DHS Extraction Method
Oil and Grease Analysis by Standard Method 503D
Hydrocarbons Analysis by Standard Method 503E
Groundwater Samples Taken on 6/7/89

Sample Number	Location	TPH-Gasoline	TPH-Diesel	Oil and Grease	Hydrocarbon
	Limit of Detection	0.5 mg/l	0.5 mg/l	50 mg/l	
4149	MW-1	ND<0.5	ND<0.5	ND<50	0.3
3225	MW-2	ND<0.5	ND<0.5	ND<50	0.5
4150	MW-4	ND<0.5	ND<0.5	ND<50	0.8
4151	MW-5	ND<0.5	ND<0.5	ND<50	0.3
4152	NW-9	ND<0.5	ND<0.5	ND<50	0.6
4157	MW-10	ND<0.5	ND<0.5	ND<50	0.5
4164	MW-11	ND<0.5	ND<0.5	ND<50	0.5
3205	MW-12	ND<0.5	ND<0.5	ND<50	0.4
3209	MW-13	ND<0.5	ND<0.5	ND<50	0.1
4181	MW-14	ND<0.5	ND<0.5	ND<50	N/D
4174	MW-15	ND<0.5	ND<0.5	ND<50	0.1
3197	MW-16	ND<0.5	ND<0.5	ND<50	0.4
4169	Duplicate MW-4	ND<0.5	ND<0.5	ND<50	0.3
4189	Duplicate MW-14	ND<0.5	ND<0.5	ND<50	0.4

ND - Not Detected

Groundwater analytical results for samples collected on April 27 and June 7, 1989 indicate that the gasoline plume is not spreading at this facility. Remedial efforts performed by AGE to this point are restricting the migration and decreasing the levels of contamination in the soils and groundwater at the Oakland Facility. Subsequent quarterly sampling events will continue to provide information on the migration of gasoline and diesel constituents in the groundwater and will monitor the remediation efforts.

5.0 REMARKS AND SIGNATURES

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

Prepared by:

for Christopher Nielson-Cerquone — 10/13/89
Project Manager — Date

Reviewed and Approved by:

REGISTERED GEOLOGIST KARL ANANIA No. 4306 STATE OF CALIFORNIA

Karl J. Anania — 10-13-89
Managing Partner — Date
California Registered Geologist No. 4306

APPENDIX A

Chemical Identity and Uniform Hazardous Waste Manifest of Recovered Free Product

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: 07/14/89
Reported: 07/17/89
Job #: 70942

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

Project: Carnation - Oakland

Lab ID #: 70942-02
Client ID: #1722 Tank

ANALYSIS:

			MDL
pH of Leach	7.0		N/A
PCB's	<0.5	mg/kg	0.5
Halogenated	4	mg/kg	1.0
Cyanide	1.4	mg/l	1.0
Sulfide	4.7	mg/l	1.0
Flashpoint	<24	C	Flammable

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

QA/QC: Spike Recovery for Halogenated Average: 82%
Spike Recovery for PCB's: 115%

METHODS:
PCB Method EPA 8080 Halogenated Method EPA 8010
Cyanide Method EPA 9010 Sulfide Method EPA 9030

Surinder Sidhu

Surinder Sidhu
Senior Chemist

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

RECEIVED JUL 25 1989

CERTIFICATE OF ANALYSIS

STATE LICENSE NO. 211

Received: 07/14/89
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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 #: 70942-2
Client ID: #1722 Tank

METAL		MDL	% SPIKE RECOVERY
Tl	ND<2.2	2.2	74
As	ND<2.2	2.2	82
Hg	ND<5.0	5.0	92
Se	ND<5.0	5.0	90
Mo	ND<1.0	1.0	84
Sb	1.2	1.0	82
Zn	ND<0.15	0.15	84
Cd	ND<0.3	0.3	70
Pb	128	1.1	84
Co	ND<0.5	0.5	84
Ni	ND<0.65	0.65	78
Cr	0.2	0.15	78
V	0.3	0.1	88
Be	ND<0.025	0.025	86
Cu	0.4	0.1	86
Ag	ND<0.1	0.1	78
Ba	0.2	0.1	84

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

Surinder Sidhu

Surinder Sidhu
Senior Chemist

CHAIN OF CUSTODY RECORD

PROJ. NO. 059

SAMPLERS: (Signature) Jim Wallace

PROJECT NAME AND ADDRESS:
ANANJIA GEOLOGICAL ENG. - CARNATION, OAKLAND
16TH & CYRESS, OAKLAND

RECEIVED 1989

CROSS REFERENCE NUMBER	DATE	TIME	SOIL	WATER	STATION LOCATION	ANALYSIS REQUESTED: TOTAL PETROLEUM HYDROCARBONS	BTX	VOC-EPA 8240	TOTAL OIL & GREASE	PCB	PREDISPOSAL ANAL	REMARKS
4417	7/14/89	1145	X		MW-2A (GRAB) 2 FT/BGS	X			X	X		24 HR TURN AROUND
1722	7/14/89	1000		X	TANK						X	PRODUCT - 24 HR TURNAROUND

RELINQUISHED BY: (Signature) Jim Wallace	DATE 7/14/89 TIME 3:00	RECEIVED BY: (Signature) Mark Ryan	DATE 7/14 TIME 3:00
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

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No: CAC000912866 | Manifest Document No.: 00066 | 2. Page 1 of 1 | Information in the shaded areas is not required by Federal law.

3. Generator's Name and Mailing Address
CARNATION DAIRY
1310-14TH STREET
OAKLAND, CALIFORNIA 94621

4. Generator's Phone (213) 932-6464

A. State Manifest Document Number: 88120913

B. State Generator's ID

5. Transporter 1 Company Name: Erickson Trucking
6. US EPA ID Number: CAD009466392

C. State Transporter's ID: 001379
D. Transporter's Phone: (415) 235-1393

7. Transporter 2 Company Name
8. US EPA ID Number

E. State Transporter's ID
F. Transporter's Phone

9. Designated Facility Name and Site Address
GIBSON OIL & REFINING CO., INC.
COMMERICAL DRIVE
BAKERSFIELD, CA 93308

10. US EPA ID Number: CAD980883177

G. State Facility's ID: CAD980883177
H. Facility's Phone: 805 327-0413

11. US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number)	12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol	I. Waste No.
a. WASTE PETROHYDROCARBON CONTAMINATED WATER. CALIFORNIA REGULATED WASTE ONLY	001	TT	04600	G	State 223; EPA/Other none
b.					State; EPA/Other
c.					State; EPA/Other
d.					State; EPA/Other

J. Additional Descriptions for Materials Listed Above
WATER: 99%
GASOLINE: 1%
RELEASE # - 9206-1

K. Handling Codes for Wastes Listed Above
a. 01
b.
c.
d.

15. Special Handling Instructions and Additional Information

16. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations.

If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; OR, if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.

Printed/Typed Name: JAMES A. PERRY | Signature: James A. Perry | Month Day Year: 07 27 89

17. Transporter 1 Acknowledgement of Receipt of Materials
Printed/Typed Name: Paul L Rote | Signature: Paul L Rote | Month Day Year: 07 27 89

18. Transporter 2 Acknowledgement of Receipt of Materials
Printed/Typed Name | Signature | Month Day Year

19. Discrepancy Indication Space
Box B missing.
Actual gallons received - 3559.

20. Facility Owner or Operator Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19.
Printed/Typed Name: Richard Mathews | Signature: [signature] | Month Day Year: 07 27 89

GENERATOR
TRANSPORTER
FACILITY

IN CASE OF AN EMERGENCY OR SPILL, CALL THE NATIONAL RESPONSE CENTER 1-800-424-8802; WITHIN CALIFORNIA CALL 1-800-852-7550

DHS 8022 A (1/88)
EPA 8700—22
(Rev. 9-88) Previous editions are obsolete.

Do Not Write Below This Line

White: TSDF SENDS THIS COPY TO DOHS WITHIN 30 DAYS
To: P.O. Box 3000, Sacramento, CA 95812

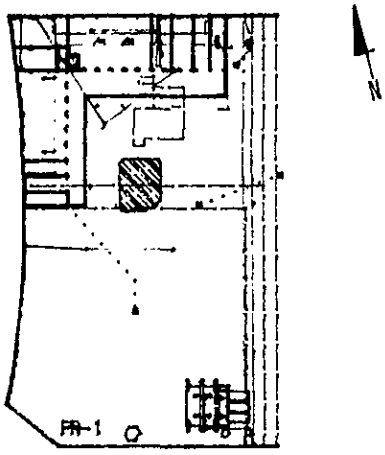
APPENDIX B

Product Recovery Probe Boring Logs
(PR-1 through PR-81)

ANANIA GEOLOGIC ENGINEERING

BORING LOG

LOCATION OF BORING



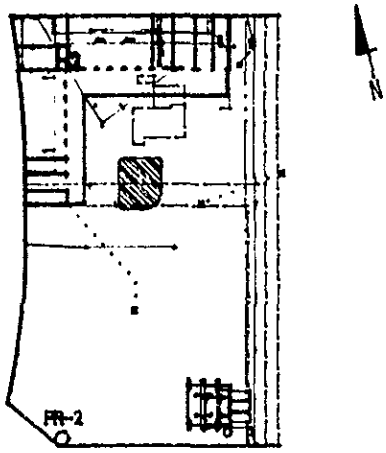
SITE/LOCATION	CARNATION/OAKLAND				BORING NO. PR-1
PROJECT NO.	004-88-059				SHEET 1 OF 1
WATER LEVEL ELEVATION	5.86				DRILLER
TIME	1200				START: TIME 0940 / DATE 2/28/89
DATE	2/28/89				FINISH: TIME 1005 / DATE 2/28/89
CASING DEPTH					
DRILLING CONTRACTOR	PC EXPLORATION				
DRILLER					
DRILLING METHOD	HOLLOW STEM AUGER				
SAMPLING METHOD	MPS				
LOGGER	ERIC HOLM				
N/S 2216.9	E/W 3056.0			ELEV. 16.73	
BORING DIAMETER: 6 INCHES			CASING DIAMETER: 2 INCHES		
REVIEWED BY: H.A.M.			DATE: 8-16-89		

DIST. FROM SURF.	WELL CONST. CASING	WELL CONST. ANNULUS	LEGEND	TLV READING	SAMPLE NO.	RECOVERY	BLOWS PER 6 IN.	USCS	LOG OF MATERIAL
								SM	SILTY SAND- RED BROWN, MOIST, MEDIUM DENSE WITH AREAS OF OXIDATION
1									NO HYDROCARBON ODOR.
2		4% BENTONITE CEMENT SLURRY							
3									
4	BLANK						7		
						X	7		
5		3/8" BENT. PELLETS		35		X	9		
6									
7									
8									
9							9		
						X	10		
10		COURSE AQUARIUM SAND		12		X	12		COLOR CHANGE TO GRAY BROWN, NO HYDROCARBON ODOR.
11									
12	.125" SLOT								
13									
14							5		
						X	5		
15				16		X	7		GRADES, WET WITH QUARTZ, MAFICS, NO HYDROCARBON ODOR.
									TEST BORING TERMINATED @ 15' ON 2-28-89
									MATERIALS: 1 1/2 BAGS OF SAND
									2/3 5 GALLON BUCKET OF BENTONITE

ANANIA GEOLOGIC ENGINEERING

BORING LOG

LOCATION OF BORING



SITE/LOCATION	CARNATION/OAKLAND				BORING NO. PR-2
PROJECT NO.	004-88-039				
WATER LEVEL ELEVATION	3.11				SHEET 1 OF 1
TIME	910				DRILLER
DATE	2/22/89				START TIME: 930 / FINISH TIME: 1040
CASING DEPTH					DATE: 2/22/89 / DATE: 2/22/89

DRILLING CONTRACTOR: PC EXPLORATION

DRILLER:

DRILLING METHOD: HOLLOW STEM AUGER

SAMPLING METHOD: MPS

LOGGER: ERIC HOLM

N/S: 2234.2 | E/W: 2977.6 | ELEV.: 15.80

BORING DIAMETER: 6 INCHES | CASING DIAMETER: 2 INCHES

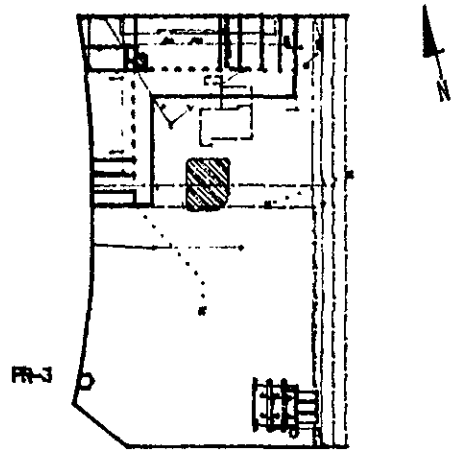
REVIEWED BY: M.A.M. DATE: 8-17-89

DIST. FROM SURF.	WELL CONST. CASING	WELL CONST. ANNULUS	LEGEND	TLV READING	SAMPLE NO.	RECOVERY	BLOWS PER 6 IN.	USCS	LOG OF MATERIAL
1		4% BENTONITE CEMENT SLURRY						SM	SILTY SAND- RED BROWN, MOIST, MEDIUM DENSE WITH QUARTZ AND MAFICS, NO HYDROCARBON ODOR.
2									
3									
4	BLANK					X	8		
		3/8" BENT. PELLETS				X	10		
5				0		X	10		NO HYDROCARBON ODOR.
6									
7		COURSE AQUARIUM SAND							
8									
9						X	10		
						X	10		
10				0		X	14		MEDIUM SAND- GRADES WITH DECREASING SILT CONTENT, RED BROWN, WET, MEDIUM DENSE WITH QUARTZ, MAFICS, NO HYDROCARBON ODOR.
11									
12	SCR								
13									
14							3		
							4		
15				0		X	4		GRADES, LOOSE WITH AREAS OF OXIDATION, QUARTZ, NO ODOR.
									TEST BORING TERMINATED @ 15' ON 2-22-89
									MATERIALS: 1 1/2 BAGS OF SAND
									2/3 5 GALLON BUCKET OF BENTONITE

ANANIA GEOLOGIC ENGINEERING

BORING LOG

LOCATION OF BORING



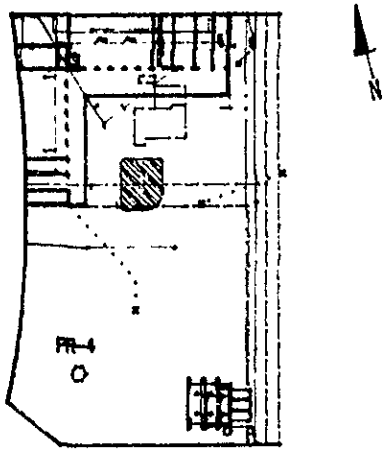
SITE/LOCATION	CARNATION/OAKLAND				BORING NO. PR-3
PROJECT NO.	004-89-039				
WATER LEVEL ELEVATION	3.23				SHEET 1 OF 1
TIME	7:55				DRILLER
DATE	2/22/89				START: TIME 6:50, DATE 2/22/89
CASING DEPTH					FINISH: TIME 8:20, DATE 2/22/89
DRILLING CONTRACTOR	PC EXPLORATION				
DRILLER					
DRILLING METHOD	HOLLOW STEM AUGER				
SAMPLING METHOD	MPS				
LOGGER	ERIC HELM				
N/S 2310.4		E/W 2960.1		ELEV. 13.90	
BORING DIAMETER: 6 INCHES			CASING DIAMETER: 2 INCHES		
REVIEWED BY: M.A.M.				DATE: 8-17-89	

DIST. FROM SURF.	WELL CONST. CASING	WELL CONST. ANNULUS	LEGEND	TLV READING	SAMPLE NO.	RECOVERY	BLOWS PER 6 IN.	USCS	LOG OF MATERIAL
								SM	SILTY SAND- RED BROWN, MOIST, MEDIUM DENSE, QUARTZ WITH MAFICS, NO HYDROCARBON ODOR.
1		42 BENTONITE CEMENT SLURRY							
2									
3									
4	BLANK					X	7		
						X	9		
5		3/8" BENT. PELLETS		4		X	9		
6									
7		COURSE AGUARDIN SAND							
8									
9							10		
						X	11		
10				4		X	14		NO HYDROCARBON ODOR.
11									
12	.020" SLOT								
13									
14						X	5		
						X	5		
15				0		X	6		COLOR CHANGE TO GREEN BROWN, WET, NO HYDROCARBON ODOR.
									TEST BORING TERMINATED @ 15 1/2' ON 2-22-89
									MATERIALS: 1 1/2 BAGS OF SAND
									2/3 5 GALLON BUCKET OF BENTONITE

ANANIA GEOLOGIC ENGINEERING

BORING LOG

LOCATION OF BORING



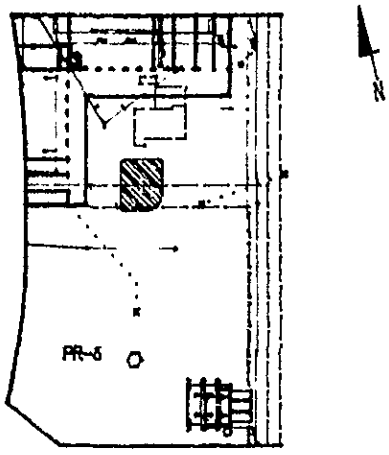
SITE/LOCATION	CARNATION/OAKLAND				BORING NO. PR-4
PROJECT NO.	004-89-059				
WATER LEVEL ELEVATION	3.75				SHEET 1 OF 1
TIME	1205				DRILLER
DATE	2/22/89				START / FINISH
CASING DEPTH					TIME 1100 / 1250
DRILLING CONTRACTOR	PC EXPLORATION				DATE 2/22/89 / 2/22/89
DRILLER					
DRILLING METHOD	HOLLOW STEM AUGER				
SAMPLING METHOD	MPS				
LOGGER	ERIC HOLM				
N/S 2297.4	E/W 3027.7			ELEV. 16.34	
BORING DIAMETER 6 INCHES			CASING DIAMETER 2 INCHES		
REVIEWED BY: M.A.M.				DATE: 8-16-89	

DIST. FROM SURF.	WELL CONST. CASING	WELL CONST. ANNULUS	LEGEND	TLV READING	SAMPLE NO.	RECOVERY	BLOWS PER 6 IN.	USCS	LOG OF MATERIAL
1		42 BENTONITE CEMENT SLURRY						SP	SAND- BROWN, MOIST, MEDIUM DENSE WITH QUARTZ CLASTS, MEDIUM GRAINED.
2									
3									
4	BLANK					X	6		
5		3/8" BENT. PELLETS		0		X	7		NO HYDROCARBON ODOR.
6									
7									
8									
9		COURSE AQUARIUS SAND				X	10		
10				4		X	12		
11						X	15		NO HYDROCARBON ODOR.
12	12" SLOT								SILTY SAND- BROWN, WET, MEDIUM DENSE WITH CLASTS OF QUARTZ, MAFICS,
13								SM	WET, NO HYDROCARBON ODOR.
14							5		
15						X	5		
				0		X	6		
									TEST BORING TERMINATED @ 15 1/2' ON 2-22-89
									MATERIALS: 1 2/3 BAGS OF SAND
									2/3 5 GALLON BUCKET OF BENTONITE

ANANIA GEOLOGIC ENGINEERING

BORING LOG

LOCATION OF BORING



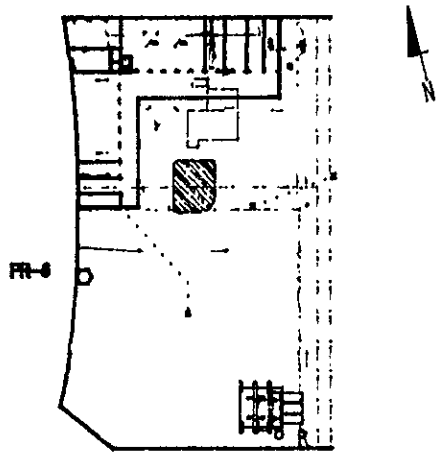
SITE/LOCATION	CARNATION/OAKLAND				BORING NO. PR-5
PROJECT NO.	004-88-059				SHEET 1 OF 1
WATER LEVEL ELEVATION	4.06				DRILLER
TIME	2:48				START: TIME 1:30; DATE 2/22/89
DATE	2/22/89				FINISH: TIME 3:15; DATE 2/22/89
CASING DEPTH					
DRILLING CONTRACTOR	PC EXPLORATION				
DRILLER					
DRILLING METHOD	HOLLOW STEM AUGER				
SAMPLING METHOD	MPS				
LOGGER	ERIC HOLM				
N/S 2294.6	E/W 3094.0			ELEV. 16.64	
BORING DIAMETER 6 INCHES			CASING DIAMETER 2 INCHES		
REVIEWED BY: M.A.M.			DATE: 8-16-89		

DIST. FROM SURF.	WELL CONST. CASING	WELL CONST. ANNULUS	LEGEND	TLV READING	SAMPLE NO.	RECOVERY	BLOWS PER 6 IN.	USCS	LOG OF MATERIAL
1		4% BENTONITE CEMENT SLURRY						SM	SILTY SAND- RED BROWN, DRY TO MOIST, LOOSE TO MEDIUM DENSE, FINE TO MEDIUM GRAINED WITH AREAS OF OXIDATION, NO HYDROCARBON.
2									
3									
4	BLANK						4		
		3/8" BENT. PELLETS				X	5		
5				0	3133	X	7		
6									
7		COURSE AQUARIUM SAND							
8									
9						X	7		
						X	8		
10				0	3134	X	10		NO HYDROCARBON ODOR.
11									
12	SLOT								
13									
14						X	4		
						X	4		
15				0		X	5		COLOR CHANGE TO LIGHT BROWN, GRADES LOOSE WITH INCREASING SILT CONTENT, NO HYDROCARBON ODOR.
									TEST BORING TERMINATED @ 15 1/2' ON 2-22-89
									MATERIALS: 1 1/2 BAGS OF SAND
									2/3 5 GALLON BUCKET OF BENTONITE

ANANIA GEOLOGIC ENGINEERING

BORING LOG

LOCATION OF BORING



SITE/LOCATION	CARNATION/OAKLAND				BORING NO. PR-6
PROJECT NO.	004-88-059				
WATER LEVEL ELEVATION	1.80				SHEET 1 OF 1
TIME	4:40				DRILLER
DATE	2/22/89				START: TIME 3:40, DATE 2/22/89
CASING DEPTH					FINISH: TIME 5:15, DATE 2/22/89

DRILLING CONTRACTOR: PC EXPLORATION

DRILLER:

DRILLING METHOD: HOLLOW STEM AUGER

SAMPLING METHOD: MPS

LOGGER: ERIC HOLM

N/S: 2424.5 | E/W: 3002.0 | ELEV.: 15.33

BORING DIAMETER: 6 INCHES | CASING DIAMETER: 2 INCHES

REVIEWED BY: M.A.M. | DATE: 8-17-89

DIST. FROM SURF.	WELL CONST. CASING	WELL CONST. ANNULUS	LEGEND	TLV READING	SAMPLE NO.	RECOVERY	BLOWS PER 6 IN.	USCS	LOG OF MATERIAL
								SM	SILTY SAND- RED BROWN, MOIST, ORGANICS, AREAS OF OXIDATION, MAFICS, NO HYDROCARBON ODOR.
1		4% BENTONITE CEMENT SLURRY							
2									
3									
4	BLANK						5		
						X	5		
5		3/8" BENT. PELLETS		0		X	5		NO HYDROCARBON ODOR.
6									
7									
8									
9						X	10		
						X	10		
10				8		X	10		NO HYDROCARBON ODOR.
11		COURSE AQUARIUM SAND							
12	.125" SLOT								
13									
14							7		
						X	9		
15				0		X	9		COLOR CHANGE TO LIGHT BROWN, GRADES, WET, NO HYDROCARBON ODOR.
									TEST BORING TERMINATED @ 15 1/2' ON 2-22-89
									MATERIALS: 1 1/2 BAGS OF SAND
									2/3 5 GALLON BUCKET OF BENTONITE

PR-7

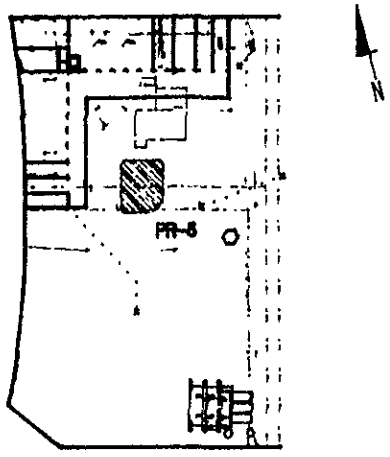
NOT DRILLED

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

ANANIA GEOLOGIC ENGINEERING

BORING LOG

LOCATION OF BORING



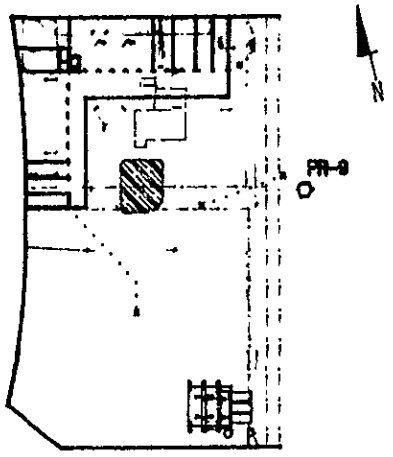
SITE/LOCATION	CARNATION/OAKLAND				BORING NO. PR-8
PROJECT NO.	004-88-059				SHEET 1 OF 1
WATER LEVEL ELEVATION	2.5	(APPROX)			DRILLER
TIME	1050				START TIME: 310
DATE	2/23/89				FINISH TIME: 505
CASING DEPTH					START DATE: 2/23/89
DRILLING CONTRACTOR	PC EXPLORATION				FINISH DATE: 2/23/89
DRILLER					
DRILLING METHOD	HOLLOW STEM AUGER				
SAMPLING METHOD	MPS				
LOGGER	ERIC HOLM				
N/S	*	E/W	*	ELEV.	*
BORING DIAMETER	6 INCHES	CASING DIAMETER	2 INCHES		
REVIEWED BY:	M.A.M.	DATE:	8-17-89		

DIST. FROM SURF.	WELL CONST. CASING	WELL CONST. ANNULUS	LEGEND	TLV READING	SAMPLE NO.	RECOVERY	BLOWS PER 6 IN.	USCS	LOG OF MATERIAL
1		4% BENTONITE CEMENT SLURRY						SM	SILTY SAND- RED BROWN, LOOSE TO MEDIUM DENSE, DRY TO MOIST WITH AREAS OF OXIDATION, QUARTZ, NO HYDROCARBON ODOR.
2									
3									
4	BLANK						6		
						X	6		
5		3/8" BENT. PELLETS		12		X	7		NO HYDROCARBON ODOR.
6									
7									
8									
9							9		
						X	10		
10		COURSE AQUARIUM SAND		27		X	12		GRADES WITH AND SOME PIECES OF 1/4" ANGULAR GRAVEL, NO HYDROCARBON ODOR.
11									
12	.125" SLOT								
13									
14							5		
							6		
15				0		X	8		
									TEST BORING TERMINATED @ 15 1/2' ON 2-23-89
									MATERIALS: 1 2/3 BAGS OF SAND
									2/3 5 GALLON BUCKET OF BENTONITE
									* AREA COVERED BY SOIL PILE, COULD NOT BE SURVEYED.

ANANIA GEOLOGIC ENGINEERING

BORING LOG

LOCATION OF BORING



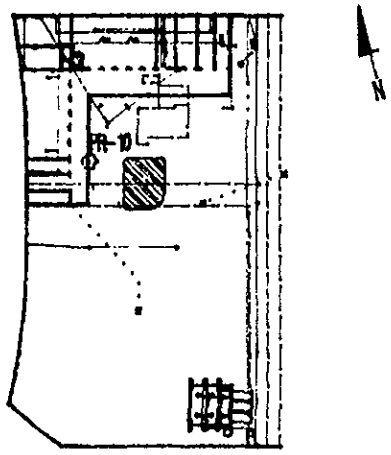
SITE/LOCATION	CARNATION/OAKLAND				BORING NO. PR-9
PROJECT NO.	004-88-059				SHEET 1 OF 1
WATER LEVEL ELEVATION	2.36				DRILLER
TIME	1:33				START: TIME 1415 / DATE 2/21/89
DATE	2/21/89				FINISH: TIME 1550 / DATE 2/21/89
CASING DEPTH					
DRILLING CONTRACTOR	PC EXPLORATION				
DRILLER					
DRILLING METHOD	HOLLOW STEM AUGER				
SAMPLING METHOD	MPS				
LOGGER	ERIC HOLM				
N/S 2424.8	E/W 3325.6			ELEV. 13.99	
BORING DIAMETER: 6 INCHES			CASING DIAMETER: 2 INCHES		
REVIEWED BY: MAM				DATE: 8-16-89	

DIST. FROM SURF.	WELL CONST. CASING	WELL CONST. ANNULUS	LEGEND	TLV READING	SAMPLE NO.	RECOVERY	BLOWS PER 6 IN.	USCS	LOG OF MATERIAL
									ASPHALTIC CONCRETE
1								SM	SILTY SAND- GRAY BROWN, DRY TO MOIST, MEDIUM DENSE WITH AREAS OF
									OXIDATION, QUARTZ, MAFICS, NO HYDROCARBON ODOR.
2		4% BENTONITE CEMENT SLURRY							
3									
4	BLANK						10		
		3/8" BENT. PELL.				X	10		
5				42		X	10		
6									
7									
8									
9						X	10		
						X	12		
10		COURSE AQUARIUM SAND		60	3138	X	14		NO HYDROCARBON ODOR.
11									
12	.125" SLOT								
13									
14							7		
						X	7		
15				60		X	7		NO HYDROCARBON ODOR.
									TEST BORING TERMINATED @ 15' ON 2-21-89
									MATERIALS: 1 2/3 BAGS OF SAND
									2/3 5 GALLON BUCKET OF BENTONITE

ANANIA GEOLOGIC ENGINEERING

BORING LOG

LOCATION OF BORING



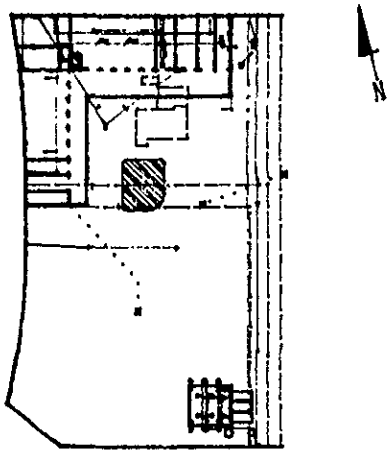
SITE/LOCATION	CARNATION/OAKLAND				BORING NO. PR-10
PROJECT NO.	004-00-059				SHEET 1 OF 1
WATER LEVEL ELEVATION	1.75				DRILLER
TIME	1050				START TIME: 1015
DATE	2/21/89				FINISH TIME: 1150
CASING DEPTH					START DATE: 2/21/89
DRILLING CONTRACTOR	PC EXPLORATION				FINISH DATE: 2/21/89
DRILLER					
DRILLING METHOD	HOLLOW STEM AUGER				
SAMPLING METHOD	MPS				
LOGGER	ERIC HOLM				
N/S 2493.8	E/W 3084.7			ELEV. 14.57	
BORING DIAMETER 6 INCHES			CASING DIAMETER 2 INCHES		
REVIEWED BY: MAM			DATE: 8-18-89		

DIST. FROM SURF.	WELL CONST. CASING	WELL CONST. ANNULUS	LEGEND	TLV READING	SAMPLE NO.	RECOVERY	BLOWS PER 6 IN.	USCS	LOG OF MATERIAL
1								SP	SAND- RED BROWN, MOIST, MEDIUM DENSE, MEDIUM TO COARSE GRAINED WITH AREAS OF OXIDATION, TRACES OF MAFICS, QUARTZ, SLIGHT HYDROCARBON ODOR.
2									
3		4% BENTONITE GRANULAR SLURRY							
4	BLANK					X	9		
5		BENT. 3/8" PELLETS		140		X	10		
6									
7									
8								SM	
9						X	10		
10		COARSE AQUARIUS SAND		22		X	14		GRADES, WET, NO HYDROCARBON ODOR.
11									
12	.020" SLOT								
13									
14						X	5		
15				0		X	5		GRADES, LOOSE, NO HYDROCARBON ODOR.
									TEST BORING TERMINATED @ 15 1/2' ON 2-21-89
									MATERIALS: 2 BAGS OF SAND
									2/3 5 GALLON BUCKET OF BENTONITE

ANANIA GEOLOGIC ENGINEERING

BORING LOG

LOCATION OF BORING



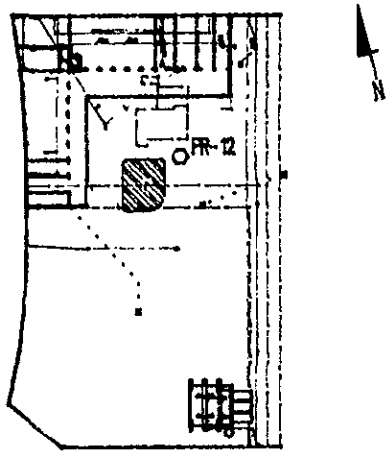
SITE/LOCATION	CARNATION/OAKLAND				BORING NO. PR-11
PROJECT NO.	084-88-059				
WATER LEVEL ELEVATION	13.68'	# BELOW GRD SURFACE			SHEET 1 OF 1
TIME	1240				DRILLER
DATE	2/21/89				START TIME: 1150 / FINISH TIME: 2:05
CASING DEPTH					START DATE: 2/21/89 / FINISH DATE: 2/21/89
DRILLING CONTRACTOR	PC EXPLORATION				
DRILLER					
DRILLING METHOD	HOLLOW STEM AUGER				
SAMPLING METHOD	MPS				
LOGGER	ERIC HELM				
N/S ###		E/W		ELEV.	
BORING DIAMETER	6 INCHES	CASING DIAMETER	2 INCHES		
REVIEWED BY: M.A.M.		DATE 8-18-89			

DIST. FROM SURF.	WELL CONST. CASING	WELL CONST. ANNULUS	LEGEND	TLV READING	SAMPLE NO.	RECOVERY	BLOWS PER 6 IN.	USCS	LOG OF MATERIAL
1		4" BENTONITE CEMENT SLURRY						SP	SAND- RED BROWN, MOIST, MEDIUM DENSE, MEDIUM TO COARSE GRAINED WITH MAFICS, QUARTZ, SLIGHT HYDROCARBON ODOR.
2									
3									
4	BLANK					X	8		
5		3/8" BENT. PELLETS		38		X	12		
6						X	14		
7									
8								SM	SILTY SAND- RED BROWN, MOIST TO WET, MEDIUM DENSE WITH AREAS OF OXIDATION, MAFICS, QUARTZ, SLIGHT HYDROCARBON ODOR.
9							7		
10		COURSE AQUARIUM SAND		34			7		
11							8		
12									
13									
14							5		
15	15FT SLOT			39			5		
							6		SLIGHT HYDROCARBON ODOR.
									TEST BORING TERMINATED @ 15 1/2' ON 2-21-89
									MATERIALS: 1 1/2 BAGS OF SAND
									2/3 5 GALLON BUCKET OF BENTONITE
									### AREAS COVERED BY SOIL STOCKPILE
									NO PRODUCT IN BAILER, SOAPY TYPE BUBBLES NOTED.

ANANIA GEOLOGIC ENGINEERING

BORING LOG

LOCATION OF BORING



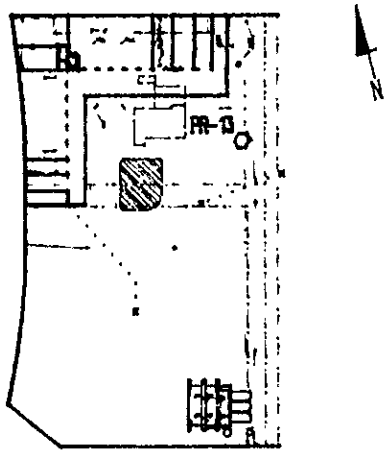
SITE/LOCATION	CARNATION/OAKLAND				BORING NO. PR-12
PROJECT NO.	004-89-059				SHEET 1 OF 1
WATER LEVEL ELEVATION	2.14				DRILLER
TIME	9:50				START: TIME 2:15, DATE 2/21/89
DATE	2/21/89				FINISH: TIME 3:50, DATE 2/21/89
CASING DEPTH ESTIMATED					
DRILLING CONTRACTOR	PC EXPLORATION				
DRILLER					
DRILLING METHOD	HOLLOW STEM AUGER				
SAMPLING METHOD	MPS				
LOGGER	ERIC HOLM				
N/S 2496.4	E/W 3189.9			ELEV. 15.24	
BORING DIAMETER 6 INCHES				CASING DIAMETER 2 INCHES	
REVIEWED BY: M.A.M.				DATE: 8-16-89	

DIST. FROM SURF.	WELL CONST. CASING	WELL CONST. SITUATION	LEGEND	TLV READING	SAMPLE NO.	RECOVERY	BLOWS PER 6 IN.	USCS	LOG OF MATERIAL
1		4% BENTONITE SLURRY GROUT						SM	SILTY SAND- GREEN GRAY, MOIST, MEDIUM DENSE, FINE TO MEDIUM GRAINED WITH SOME ORGANICS, STRONG HYDROCARBON ODOR.
2									
3									
4	BLANK					X	9		
5		3/8" BENT. PELLETS		110		X	11		STRONG HYDROCARBON ODOR.
6									
7									
8									
9						X	10		
10		COARSE MONTEREY SAND		1000		X	13		STRONG HYDROCARBON ODOR.
11									
12	12" SLOT								
13									
14							5		
15				15			6		
							7		GRADES, WET, LOOSE TO MEDIUM DENSE, STRONG HYDROCARBON ODOR.
									TEST BORING TERMINATED @ 15 1/2' ON 2-21-89
									MATERIALS: 1 3/4 BAGS OF SAND
									2/3 5 GALLON BUCKET OF BENTONITE
									PRODUCT ON BOTTOM OF THE AUGER WHEN PULLED OUT 1010 ON 2-21-89.

ANANIA GEOLOGIC ENGINEERING

BORING LOG

LOCATION OF BORING



SITE/LOCATION	CARNATION/OAKLAND				BORING NO. PR-13
PROJECT NO.	004-88-039				
WATER LEVEL ELEVATION	1.96				SHEET 1 OF 1
TIME	1:45				DRILLER
DATE	3/28/89				START / FINISH
CASING DEPTH					TIME 11:00 / TIME 11:40
DRILLING CONTRACTOR	PC EXPLORATION				DATE 3/28/89 / DATE 3/28/89
DRILLER					
DRILLING METHOD	HOLLOW STEM AUGER				

SAMPLING METHOD: 140# HAMMER 30" DROP, MODIFIED CALIFORNIA SAMPLER.

LOGGER: ERIC HOLM

N/S: 2488.5 | E/W: 3263.7 | ELEV.: 15.05

BORING DIAMETER: 6 INCHES | CASING DIAMETER: 2 INCHES

REVIEWED BY: M.A.M. DATE: 8-18-89

DIST. FROM SURF.	WELL CONST. CASING	WELL CONST. ANNULUS	LEGEND	TLV READING	SAMPLE NO.	RECOVERY	BLOWS PER 6 IN.	USCS	LOG OF MATERIAL
1		4% BENTONITE CEMENT SLURRY						SM	SILTY SAND- RED BROWN, DRY TO MOIST, MEDIUM DENSE WITH AREAS OF OXIDATION, QUARTZ, MAFICS, NO HYDROCARBON ODOR.
2									
3									
4	BLANK					X	8		
5		3/8" BENT. PELLETS		19		X	10		
6									
7									
8							7		
9							8		
10		COURSE AQUARIUM SAND		18			10		NO HYDROCARBON ODOR.
11	.125" SLOT								
12									
13									
14							6		
15				0		X	6		GRADES WITH DECREASING SILT CONTENT, WET, NO HYDROCARBON ODOR.
							8		TEST BORING TERMINATED @ 15 1/2' ON 2-28-89

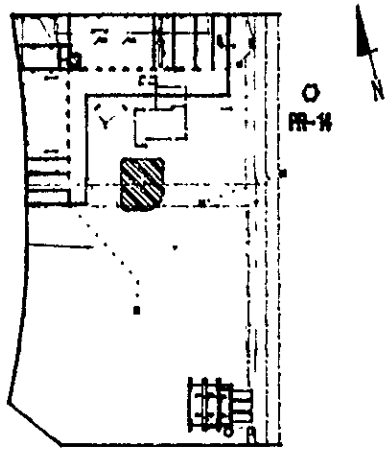
MATERIALS: 1 1/2 BAGS OF SAND

2/3 5 GALLON BUCKET OF BENTONITE

ANANIA GEOLOGIC ENGINEERING

BORING LOG

LOCATION OF BORING



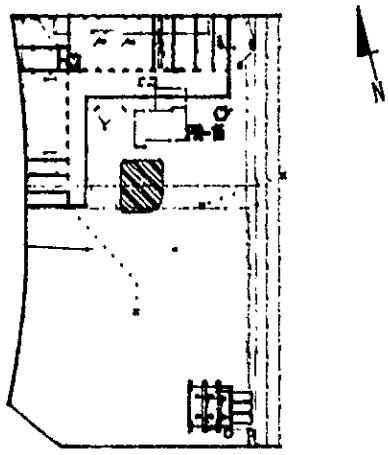
SITE/LOCATION	CARNATION/OAKLAND				BORING NO. PR-14
PROJECT NO.	004-88-059				SHEET 1 OF 1
WATER LEVEL ELEVATION	2.65				DRILLER
TIME	1:40				START: TIME 1:20; FINISH: TIME 2:40
DATE	3/28/89				START: DATE 3/28/89; FINISH: DATE 3/28/89
CASING DEPTH					
DRILLING CONTRACTOR	PC EXPLORATION				
DRILLER					
DRILLING METHOD	HOLLOW STEM AUGER				
SAMPLING METHOD	140# HAMMER 30" DROP, MODIFIED CALIFORNIA SAMPLER				
LOGGER	ERIC HOLM				
N/S 2518.2	E/W 3354.4			ELEV. 15.55	
BORING DIAMETER 6 INCHES			CASING DIAMETER 2 INCHES		
REVIEWED BY: M.A.M.			DATE: 8-18-89		

DIST. FROM SURF.	WELL CONST. CASING	WELL CONST. ANNULUS	LEGEND	TLV READING	SAMPLE NO.	RECOVERY	BLOWS PER 6 IN.	USCS	LOG OF MATERIAL
1		4% BENTONITE CEMENT SLURRY						SM	SILTY SAND- RED BROWN, MOIST, MEDIUM DENSE, MEDIUM GRAINED
									WITH QUARTZ, MAFICS.
2									
3									
4	BLANK						7		
		3/8" BENT. PELLETS				X	8		
5				8		X	12		NO HYDROCARBON ODOR.
6									
7		COURSE AGGARTIN SAND							
8									
9							8		
							9		
10				7		X	12		NO HYDROCARBON ODOR.
11									
12	12SP SLOT								
13									
14							5		
						X	6		
15				18		X	7		GRADES, WET, AREAS OF OXIDATION, NO HYDROCARBON ODOR.
									TEST BORING TERMINATED @ 15 1/2' ON 2-28-89
									MATERIALS: 1 1/2 BAGS OF SAND
									2/3 5 GALLON BUCKET OF BENTONITE

ANANIA GEOLOGIC ENGINEERING

BORING LOG

LOCATION OF BORING



SITE/LOCATION	CARNATION/OAKLAND				BORING NO. PR-15
PROJECT NO.	004-88-059				
WATER LEVEL ELEVATION	2.01				SHEET 1 OF 1
TIME	1:43				DRILLER
DATE	3/28/89				START: TIME 3:30, DATE 3/28/89
CASING DEPTH					FINISH: TIME 5:00, DATE 3/28/89

DRILLING CONTRACTOR: PC EXPLORATION

DRILLER:

DRILLING METHOD: HOLLOW STEM AUGER

SAMPLING METHOD: 140# HAMMER 30" DROP, MODIFIED CALIFORNIA SAMPLER

LOGGER: ERIC HOLM

N/S: 2530.1 | E/W: 3252.5 | ELEV.: 15.06

BORING DIAMETER: 6 INCHES | CASING DIAMETER: 2 INCHES

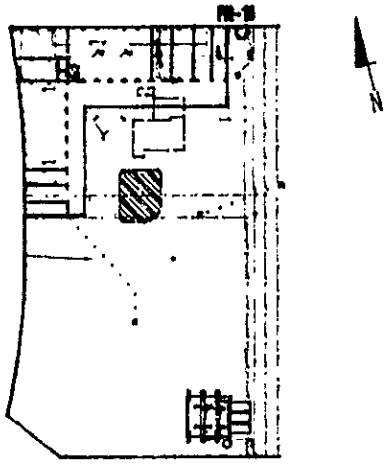
REVIEWED BY: M.A.M. | DATE: 8-16-89

DIST. FROM SURF.	WELL CONST. CASING	WELL CONST. ANNULUS	LEGEND	TLV READING	SAMPLE NO.	RECOVERY	BLOWS PER 6 IN.	USCS	LOG OF MATERIAL
0									SILTY SAND- RED BROWN, MOIST, MEDIUM DENSE WITH AREAS OF OXIDATION.
1		4% BENTONITE CEMENT SLURRY						SM	QUARTZ, MAFICS, NO HYDROCARBON ODOR.
2									
3									
4	BLANK					X	7		
5		3/8" BENT. PELLETS		38		X	10		
6									
7									
8							9		
9						X	10		
10		COURSE AQUARIUM SAND		50		X	10	SP	SAND- RED BROWN, MOIST, MEDIUM DENSE, FINE GRAINED WITH QUARTZ, MAFICS, NO HYDROCARBON ODOR.
11									
12	12" SLOT								
13									
14							5		
15				31		X	8 9		GRADES, WET, FINE TO MEDIUM GRAINED, NO HYDROCARBON ODOR.
									TEST BORING TERMINATED @ 15 1/2' ON 2-28-89
									MATERIALS: 1 3/4 BAGS OF SAND
									2/3 5 GALLON BUCKET OF BENTONITE

ANANIA GEOLOGIC ENGINEERING

BORING LOG

LOCATION OF BORING



SITE/LOCATION	CARNATION/OAKLAND				BORING NO. PR-16
PROJECT NO.	004-88-059				SHEET 1 OF 1
WATER LEVEL ELEVATION	.99				DRILLER
TIME	1:56				START TIME 7:00 / FINISH TIME 8:30
DATE	3/28/89				START DATE 3/28/89 / FINISH DATE 3/28/89
CASING DEPTH					

DRILLING CONTRACTOR: PC EXPLORATION

DRILLER:

DRILLING METHOD: HOLLOW STEM AUGER

SAMPLING METHOD: 140# HAMMER 30" DROP, MODIFIED CALIFORNIA SAMPLER

LOGGER: ERIC HOLM

N/S 2619.4 | E/W 3305.3 | ELEV. 14.87

BORING DIAMETER: 6 INCHES | CASING DIAMETER: 2 INCHES

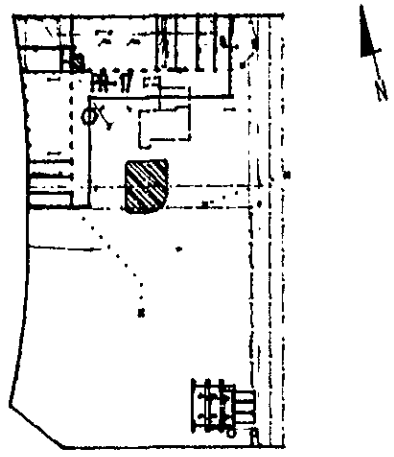
REVIEWED BY: M.A.M. DATE: 8-18-89

DIST. FROM SURF.	WELL CONST. CASING	WELL CONST. ANNULUS	LEGEND	TLV READING	SAMPLE NO.	RECOVERY	BLOWS PER 6 IN.	USCS	LOG OF MATERIAL
0								SM	SILTY SAND- RED BROWN, DRY TO MOIST, MEDIUM DENSE, MEDIUM GRAINED
1									WITH QUARTZ, MAFICS, SLIGHT HYDROCARBON ODOR.
2		4% BENTONITE CEMENT SLURRY							
3									
4	BLANK					X	11		
5		3/8" BENT. PELLETS		280		X	12		
6						X	12		
7									
8									
9							8		
10				80		X	8		COLOR CHANGE TO GREEN GRAY AND AREAS OF BROWN, NO HYDROCARBON ODOR.
11		COURSE AQUARIUS SAND							
12	0.125" SLOT								
13									
14							5		
15				5		X	5		
						X	6		GRADES, WET, NO HYDROCARBON ODOR.
									TEST BORING TERMINATED @ 15 1/2' ON 2-29-89.
									MATERIALS: 1 2/3 BAGS OF SAND
									2/3 5 GALLON BUCKET OF BENTONITE

ANANIA GEOLOGIC ENGINEERING

BORING LOG

LOCATION OF BORING



SITE/LOCATION	CARNATION/OAKLAND				BORING NO. PR-17
PROJECT NO.	004-88-059				SHEET 1 OF 1
WATER LEVEL ELEVATION	.67				DRILLER
TIME	2:05				START TIME 1:30 / FINISH TIME 3:00
DATE	2/23/89				START DATE 2/23/89 / FINISH DATE 2/23/89
CASING DEPTH					

DRILLING CONTRACTOR: PC EXPLORATION

DRILLER:

DRILLING METHOD: HOLLOW STEM AUGER

SAMPLING METHOD: 140# HAMMER 30" DROP, MODIFIED CALIFORNIA SAMPLER

LOGGER: ERIC HOLM

N/S: 2575.3 | E/W: 3101.7 | ELEV.: 14.62

BORING DIAMETER: 6 INCHES | CASING DIAMETER: 2 INCHES

REVIEWED BY: M.A.M. DATE: 9-18-89

DIST. FROM SURF.	WELL CONST. CASING	WELL CONST. ANNULUS	LEGEND	TLV READING	SAMPLE NO.	RECOVERY	BLOWS PER 6 IN.	USCS	LOG OF MATERIAL
1		4% BENTONITE CEMENT SLURRY						SM	SILTY SAND- RED BROWN, DRY TO MOIST, MEDIUM DENSE, COLOR CHANGE WITH AREAS OF OXIDATION, QUARTZ, MAFIC CLASTS, SLIGHT HYDROCARBON ODOR.
2									
3									
4	BLANK						10		
5		3/8" BENT. PELLETS		25		X	13		
6						X	14		
7									COLOR CHANGE TO GRAY BLACK, STRONG HYDROCARBON ODOR.
8									
9						X	10		
10				25		X	10		
11						X	13		COLOR CHANGE TO RED BROWN, NO HYDROCARBON ODOR.
12	0.125" SLOT						5		
13		COURSE AGGREGATE SAND		20	3135	X	6		
14							7		COLOR CHANGE TO GREEN GRAY, GRADES WET, LOOSE, NO HYDROCARBON ODOR.
15									
16									
17									
18									COLOR CHANGE TO RED BROWN.
19									TEST BORING TERMINATED @ 20' ON 2-23-89
20							7		MATERIALS: 1 3/4 BAGS OF SAND
						X	8		2/3 5 GALLON BUCKET OF BENTONITE
				5		X	11		

PR-18

NOT DRILLED

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

PR-19

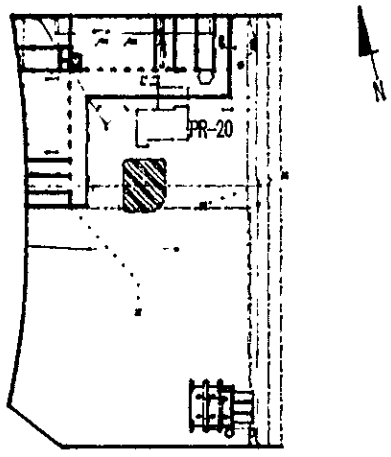
NOT DRILLED

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

ANANIA GEOLOGIC ENGINEERING

BORING LOG

LOCATION OF BORING



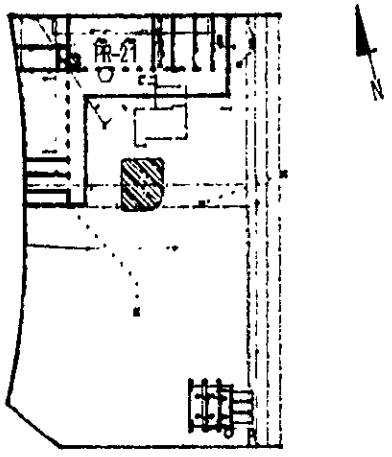
SITE/LOCATION	CARNATION/OAKLAND				BORING NO. PR-20
PROJECT NO.	004-89-059				
PRODUCT LEVEL ELEVATION	.86				SHEET 1 OF 1
TIME	11:50				DRILLER
DATE	2/23/89				START / FINISH
CASING DEPTH					TIME: 11:00 / 12:50
DRILLING CONTRACTOR	PC EXPLORATION				DATE: 2/23/89 / 2/23/89
DRILLER					
DRILLING METHOD	HOLLOW STEM AUGER				
SAMPLING METHOD	140# HAMMER 30" DROP, MODIFIED CALIFORNIA SAMPLER				
LOGGER	ERIC HOLM				
N/S 2574.5	E/W 3243.4			ELEV. 14.64	
BORING DIAMETER: 6 INCHES			CASING DIAMETER: 2 INCHES		
REVIEWED BY: M.A.M.				DATE: 8-24-89	

DIST. FROM SURF.	WELL CONST. CASING	WELL CONST. ANNULUS	LEGEND	TLV READING	SAMPLE NO.	RECOVERY	BLOWS PER 6 IN.	USCS	LOG OF MATERIAL
0								SM	SILTY SAND- RED MOTTLED, RED TO BROWN, MOIST, QUARTZ WITH MAFICS, MEDIUM DENSE, HYDROCARBON ODOR.
1		4% BENTONITE CEMENT SLURRY							
2									
3									
4	BLANK						10		
						X	11		
5		3/8" BENT. PELLETS		1600		X	10		SLIGHT HYDROCARBON ODOR.
6									
7									
8									
9							10		
						X	11		
10		COURSE ARMARTON SAND		5400		X	12		SLIGHT HYDROCARBON ODOR.
11									
12	.125" SLOT								
13									
14							7		
						X	7		
15				10,000		X	9		GRADES WITH INCREASING SAND, MEDIUM GRAINED, STRONG HYDROCARBON ODOR.
									TEST BORING TERMINATED @ 15 1/2' ON 2-23-89
									PRODUCT ENCOUNTERED
									MATERIALS: 1 3/4 BAGS OF SAND
									2/3 5 GALLON BUCKET OF BENTONITE

ANANIA GEOLOGIC ENGINEERING

BORING LOG

LOCATION OF BORING



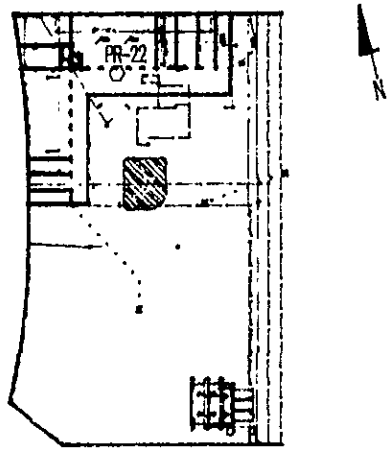
SITE/LOCATION	CARNATION/OAKLAND				BORING NO. PR-21
PROJECT NO.	004-68-059				
PRODUCT LEVEL ELEVATION	.97				SHEET 1 OF 1
TIME	2:05				DRILLER
DATE	3/28/89				START TIME: 1:20 / FINISH TIME: 3:15
CASING DEPTH					START DATE: 3/28/89 / FINISH DATE: 3/28/89
DRILLING CONTRACTOR	PC EXPLORATION				
DRILLER					
DRILLING METHOD	HOLLOW STEM AUGER				
LOGGER	ERIC HOLM				
N/S 2608.8	E/W 3140.1			ELEV. 14.60	
BORING DIAMETER: 6 INCHES			CASING DIAMETER: 2 INCHES		
REVIEWED BY: M.A.M.				DATE: 8-24-89	

DIST. FROM SURF.	WELL CONST. CASING	WELL CONST. ANNULUS	LEGEND	TLV READING	SAMPLE NO.	RECOVERY	BLOWS PER 6 IN.	USCS	LOG OF MATERIAL
1		4% BENTONITE CEMENT SLURRY						SM	SILTY SAND- RED BROWN, MOIST, MEDIUM DENSE WITH MAFICS, QUARTZ, STRONG HYDROCARBON ODOR.
2									
3									
4	BLANK					X	8		
5		3/8" BENT. PELLETS		6500	3136	X	9		STRONG HYDROCARBON ODOR.
6									
7		COURSE AQUARIUS SAND							
8									
9						X	8		
10				6000		X	9		STRONG HYDROCARBON ODOR.
11									
12	0.020" SLOT								
13									
14							9		
15				6500		X	10		STRONG HYDRCARBON ODOR.
							12		
									TEST BORING TERMINATED @ 15 1/2' ON 2-22-89
									MATERIALS: 2 BAGS OF SAND
									2/3 5 GALLON BUCKET OF BENTONITE

ANANIA GEOLOGIC ENGINEERING

BORING LOG

LOCATION OF BORING



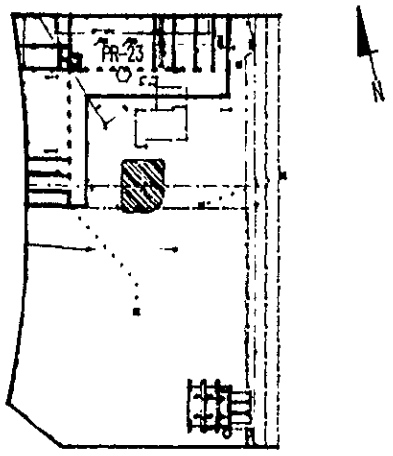
SITE/LOCATION	CARNATION/OAKLAND				BORING NO. PR-22
PROJECT NO.	004-88-039				
PRODUCT LEVEL ELEVATION	1.03				SHEET 1 OF 1
TIME	2:10				DRILLER
DATE	3/28/89				START / FINISH
CASING DEPTH					TIME 11:45 / TIME 1:10
DRILLING CONTRACTOR	PC EXPLORATION				DATE 3/28/89 / DATE 3/28/89
DRILLER					
DRILLING METHOD	HOLLOW STEM AUGER				
SAMPLING METHOD: 140# HAMMER 30" DROP, MODIFIED CALIFORNIA SAMPLER.					
LOGGER ERIC HOLM					
N/S 2605.7	E/W 3149.7			ELEV. 14.61	
BORING DIAMETER: 6 INCHES			CASING DIAMETER: 2 INCHES		
REVIEWED BY: M.A.M.			DATE: 8-29-89		

DIST. FROM SURF.	WELL CONST. CASING	WELL CONST. ANNULUS	LEGEND	TLV READING	SAMPLE NO.	RECOVERY	BLOWS PER 6 IN.	USCS	LOG OF MATERIAL
									SILTY SAND- RED BROWN, DRY TO MOIST, MEDIUM DENSE, MAFICS, QUARTZ,
1		4% BENTONITE CEMENT SLURRY							STRONG HYDROCARBON ODOR.
2									
3									
4	BLANK						10		
						X	10		
5		3/8" BENT. PELLETS		2500		X	11		STRONG HYDROCARBON ODOR.
6									
7									
8								SM	
9						X	7		
						X	9		
10		COURSE AQUARIUM SAND		10,000		X	11		STRONG HYDROCARBON ODOR.
11									
12	0.020" SLOT								
13									
14							7		
							7		
15				1500		X	8		GRADES WITH INCREASING SAND CONTENT, STRONG HYDRCARBON ODOR.
									TEST BORING TERMINATED @ 15 1/2' ON 2-28-89
									MATERIALS: 1 3/4 BAGS OF SAND
									2/3 5 GALLON BUCKET OF BENTONITE

ANANIA GEOLOGIC ENGINEERING

BORING LOG

LOCATION OF BORING



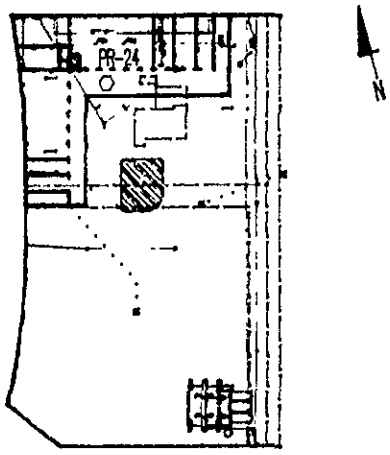
SITE/LOCATION	CARNATION/OAKLAND				BORING NO. PR-23
PROJECT NO.	004-88-059				SHEET 1 OF 1
PRODUCT LEVEL ELEVATION	13.40'				DRILLER
TIME	845				START: TIME 715
DATE	2/24/89				FINISH: TIME 950
CASING DEPTH					START: DATE 2/24/89
DRILLING CONTRACTOR	PC EXPLORATION				FINISH: DATE 2/24/89
DRILLER					
DRILLING METHOD	HOLLOW STEM AUGER				
SAMPLING METHOD: 140# HAMMER 30" DROP, MODIFIED CALIFORNIA SAMPLER.					
LOGGER	ERIC HELM				
N/S 26030	E/W 3159.3			ELEV. 14.61	
BORING DIAMETER: 6 INCHES			CASING DIAMETER: 2 INCHES		
REVIEWED BY: M.A.M.				DATE: 8-28-89	

DIST. FROM SURF.	WELL CONST. CASING	WELL CONST. ANNULUS	LEGEND	TLV READING	SAMPLE NO.	RECOVERY	BLOWS PER 6 IN.	USCS	LOG OF MATERIAL
1		4% BENTONITE CEMENT SLURRY							
2									
3									
4	BLANK					X	6		
5		3/8" BENT. PELLETS		3200		X	8		SILTY SAND- RED BROWN, MOIST, MEDIUM DENSE WITH AREAS OF OXIDATION, QUARTZ, MAFICS, STRONG HYDROCARBON ODOR.
6									
7									
8									
9							8	SM	
10		COARSE AQUARIUM SAND		10,000		X	9		STRONG HYDROCARBON ODOR.
11						X	10		
12	SLOT								
13									
14							6		
15							7		
				10,000		X	9		GRADES WET, MEDIUM DENSE, STRONG HYDROCARBON ODOR.
									TEST BORING TERMINATED @ 15 1/2' ON 2-24-89
									PRODUCT ENCOUNTERED
									MATERIALS: 1 3/4 BAGS OF SAND
									2/3 5 GALLON BUCKET OF BENTONITE

ANANIA GEOLOGIC ENGINEERING

BORING LOG

LOCATION OF BORING



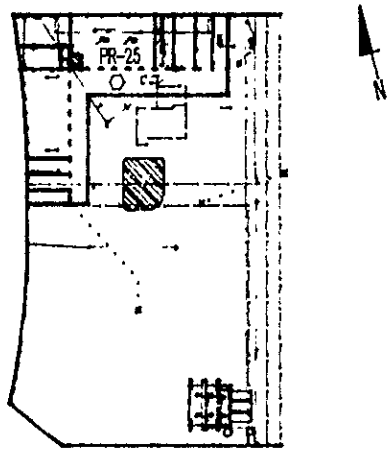
SITE/LOCATION	CARNATION/OAKLAND				BORING NO. PR-24
PROJECT NO.	004-88-059	TIME			SHEET 1 OF 1
PRODUCT LEVEL ELEVATION	0.76				DRILLER
TIME	1000				START TIME: 900
DATE	2/24/89				FINISH TIME: 1040
CASING DEPTH					START DATE: 2/24/89
DRILLING CONTRACTOR	PC EXPLORATION				FINISH DATE: 2/24/89
DRILLER					
DRILLING METHOD	HOLLOW STEM				
SAMPLING METHOD: 140# HAMMER 30" DROP, MODIFIED CALIFORNIA SAMPLER.					
LOGGER	ERIC HOLM				
N/S 2598.8	E/W 3137.4		ELEV. 14.57		
SURFACE CONDITIONS	ASPHALT				
REVIEWED BY: M.A.M.			DATE 8-28-89		

DIST. FROM SURF.	WELL CONST. CASING	WELL CONST. ANNULUS	LEGEND	TLV READING	SAMPLE NO.	RECOVERY	BLOWS PER 6 IN.	USCS	LOG OF MATERIAL
0		4% BENTONITE CEMENT SLURRY						SM	SILTY SAND- RED BROWN, MOIST, MEDIUM DENSE WITH QUARTZ, MAFICS
1									STRONG HYDROCARBON ODOR.
2									
3									
4	BLANK					X	8		
		3/8" BENT. PELLETS				X	13		
5				2000		X	14		STRONG HYDROCARBON ODOR
6									
7		COURSE AQUARIUM SAND							
8									
9							12		
						X	12		
10				1900		X	11		STRONG HYDROCARBON ODOR.
11									
12	0.125" SLOT								
13									
14							5		
						X	6		
15				10		X	8		GRADES WET, MODERATE HYDROCARBON ODOR.
									TEST BORING TERMINATED @ 15' ON 2-24-89
									PRODUCT ENCOUNTERED
									MATERIALS: 1 3/4 BAGS OF SAND
									2/3 5 GALLON BUCKET OF BENTONITE

ANANIA GEOLOGIC ENGINEERING

BORING LOG

LOCATION OF BORING



SITE/LOCATION	CARNATION/OAKLAND				BORING NO. PR-25
PROJECT NO.	004-88-059				SHEET 1 OF 1
PRODUCT LEVEL ELEVATION	.84				DRILLER
TIME	1155				START TIME: 1100 / FINISH TIME: 1235
DATE	2/24/89				START DATE: 2/24/89 / FINISH DATE: 2/24/89
CASING DEPTH					

DRILLING CONTRACTOR: PC EXPLORATION

DRILLER:

DRILLING METHOD: HOLLOW STEM AUGER

SAMPLING METHOD: 140# HAMMER 30" DROP, MODIFIED CALIFORNIA SAMPLER.

LOGGER: ERIC HOLM

N/S: 2596.1 | E/W: 3147.0 | ELEV.: 14.56

BORING DIAMETER: 6 INCHES | CASING DIAMETER: 2 INCHES

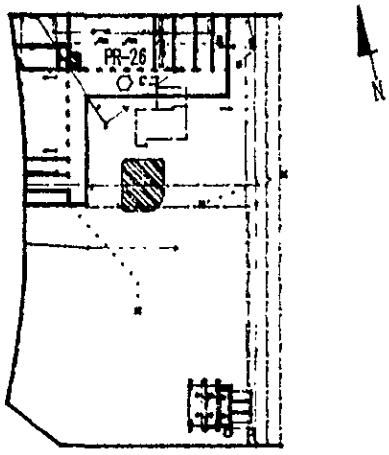
REVIEWED BY: M.A.M. DATE: 9-26-89

DIST. FROM SURF.	WELL CONST. CASING	WELL CONST. ANNULUS	LEGEND	TLV READING	SAMPLE NO.	RECOVERY	BLOWS PER 6 IN.	USCS	LOG OF MATERIAL
								SM	SILTY SAND- RED BROWN, DRY TO MOIST, MEDIUM DENSE WITH QUARTZ,
1									MAFICS, STRONG HYDROCARBON ODOR.
2		4% BENTONITE CEMENT SLURRY							
3									
4	BLANK						11		
						X	11		
5		3/8" BENT. PELLETS		5000		X	13		STRONG HYDROCARBON ODOR.
6									
7									
8									
9							9		
						X	9		
10		COURSE AGGREGATE SAND		10,000		X	9		STRONG HYDROCARBON ODOR.
11									
12	SLOT SIZE								
13									
14							10		
							10		
15				200		X	12		GRADES WET, HYDROCARBON ODOR.
									TEST BORING TERMINATED @ 15' ON 2-24-89
									PRODUCT ENCOUNTERED
									MATERIALS: 1 3/4 BAGS OF SAND
									2/3 5 GALLON BUCKET OF BENTONITE

ANANIA GEOLOGIC ENGINEERING

BORING LOG

LOCATION OF BORING



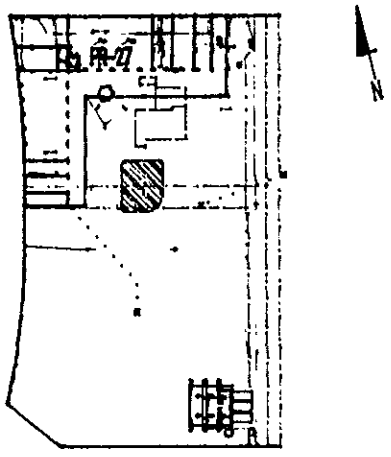
SITE/LOCATION	CARNATION/OAKLAND				BORING NO. PR-26
PROJECT NO.	004-88-059				
PRODUCT LEVEL	0.83				SHEET 1 OF 1
TIME	2:00				DRILLER
DATE	2/24/89				START TIME 1:05 / FINISH TIME 2:40
CASING DEPTH					
DRILLING CONTRACTOR	PC EXPLORATION				START DATE 2/24/89 / FINISH DATE 2/24/89
DRILLER					
DRILLING METHOD	HOLLOW STEM AUGER				
SAMPLING METHOD: 140# HAMMER 30" DROP, MODIFIED CALIFORNIA SAMPLER.					
LOGGER	ERIC HEILM				
N/S 25934	E/W 3136.8				ELEV. 14.58
BORING DIAMETER: 6 INCHES					CASING DIAMETER: 2 INCHES
REVIEWED BY: M.A.M.					DATE 8-28-89

DIST. FROM SURF.	WELL CONST. CASING	WELL CONST. ANNULUS	LEGEND	TLV READING	SAMPLE NO.	RECOVERY	BLOWS PER 6 IN.	USCS	LOG OF MATERIAL
									SILTY SAND- MOTTLED RED BROWN, MOIST, MEDIUM DENSE WITH QUARTZ,
1		4% BENTONITE CEMENT SLURRY							MAFICS, STRONG HYDROCARBON ODOR.
2									
3									
4	BLANK						7		
		3/8" BENT. PELLETS				X	9		
5				10,000		X	10		STRONG HYDROCARBON ODOR.
6									
7									
8									
9						X	8		
						X	8		
10		COURSE AQUARIUS SAND		4,000		X	8	SM	STRONG HYDROCARBON ODOR.
11									
12	.020" SLOT								
13									
14							8		
						X	9		
15				10		X	10		COLOR CHANGE TO BROWN, GRADES WET, SLIGHT HYDROCARBON ODOR.
									TEST BORING TERMINATED @ 15' ON 2-24-89.
									PRODUCT ENCOUNTERED
									MATERIALS: 1 3/4 BAGS OF SAND
									2/3 5 GALLON BUCKET OF BENTONITE

ANANIA GEOLOGIC ENGINEERING

BORING LOG

LOCATION OF BORING



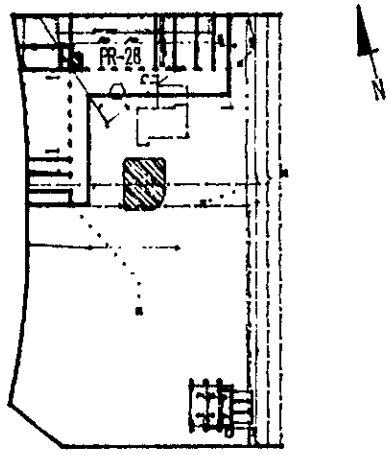
SITE/LOCATION	CARNATION/OAKLAND				BORING NO. PR-27
PROJECT NO.	004-88-059				SHEET 1 OF 1
WATER LEVEL ELEVATION	0.72				DRILLER
TIME	400				START TIME: 1105 / FINISH TIME: 1240
DATE	2/24/89				START DATE: 2/24/89 / FINISH DATE: 2/24/89
CASING DEPTH					
DRILLING CONTRACTOR	PC EXPLORATION				
DRILLER					
DRILLING METHOD	HOLLOW STEM AUGER				
SAMPLING METHOD: 140# HAMMER 30" DROP, MODIFIED CALIFORNIA SAMPLER.					
LOGGER	ERIC HOLM				
N/S 2589.5	E/W 3134.6			ELEV. 14.56	
BORING DIAMETER: 6 INCHES			CASING DIAMETER: 2 INCHES		
REVIEWED BY: M.A.M.				DATE 8-28-89	

DIST. FROM SURF.	WELL CONST. CASING	WELL CONST. ANNULUS	LEGEND	TLV READING	SAMPLE NO.	RECOVERY	BLOWS PER 6 IN.	USCS	LOG OF MATERIAL
1		4% BENTONITE CEMENT SLURRY						SM	SILTY SAND- RED BROWN, MOIST, MEDIUM DENSE WITH QUARTZ, MAFICS, SLIGHT HYDROCARBON ODOR.
2									STRONG HYDROCARBON ODOR.
3									
4	BLANK					X	7		
5		3/8" BENT. PELLETS		120		X	11		SLIGHT HYDROCARBON ODOR.
6									
7		COURSE AQUARIUS SAND							
8									
9							10		
10				120		X	10		SLIGHT HYDROCARBON ODOR.
11									
12	.125" SLOT								
13									
14							9		
15				10		X	11		GRADES WITH INCREASING SILT CONTENT, AREAS OF OXIDATION, WET, NO HYDROCARBON ODOR.
						X	13		
									TEST BORING TERMINATED @ 15' ON 2-24-89
									MATERIALS: 1 3/4 BAGS OF SAND
									2/3 5 GALLON BUCKET OF BENTONITE

ANANIA GEOLOGIC ENGINEERING

BORING LOG

LOCATION OF BORING



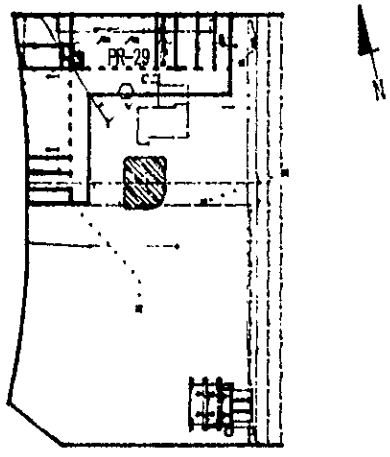
SITE/LOCATION	CARNATION/OAKLAND				BORING NO. PR-28
PROJECT NO.	004-88-059				SHEET 1 OF 1
WATER LEVEL ELEVATION	0.84				DRILLER
TIME	920				START TIME: 730 / FINISH TIME: 900
DATE	2/22/89				START DATE: 2/22/89 / FINISH DATE: 2/22/89
CASING DEPTH					
DRILLING CONTRACTOR	PC EXPLORATION				
DRILLER					
DRILLING METHOD	HOLLOW STEM AUGER				
SAMPLING METHOD: 140# HAMMER 30" DROP, MODIFIED CALIFORNIA SAMPLER.					
LOGGER	ERIC HOLM				
N/S 2586.5	E/W 3144.5	ELEV. 14.52			
BORING DIAMETER: 6 INCHES	CASING DIAMETER: 2 INCHES				
REVIEWED BY: MAM	DATE 8-28-89				

DIST. FROM SURF.	WELL CONST. CASING	WELL CONST. ANNULUS	LEGEND	TLV READING	SAMPLE NO.	RECOVERY	BLOWS PER 6 IN.	USCS	LOG OF MATERIAL
0								SM	SILTY SAND- RED BROWN, AREAS OF GREEN STAINING, DRY TO MOIST, MEDIUM
1									DENSE WITH AREAS OF OXIDATION, QUARTZ, MAFICS, STRONG
		4% BENTONITE CEMENT SLURRY							HYDROCARBON ODOR.
2									STRONG HYDROCARBON ODOR.
3									
4	BLANK						8		
						X	10		
5		3/8" BENT. PELLETS		2000		X	10		STRONG HYDROCARBON ODOR.
6									
7									
8									
9						X	9		
						X	10		
10				1500		X	12		STRONG HYDROCARBON ODOR.
11									
12	SLOT	COURSE AGGREGATE SAND							
13									
14							8		
						X	9		
15				10		X	9		GRADES WET, SLIGHT HYDROCARBON ODOR.
									TEST BORING TERMINATED @ 15' ON 2-22-89
									MATERIALS: 1 3/4 BAGS OF SAND
									2/3 5 GALLON BUCKET OF BENTONITE

ANANIA GEOLOGIC ENGINEERING

BORING LOG

LOCATION OF BORING



SITE/LOCATION	CARNATION/OAKLAND				BORING NO. PR-29
PROJECT NO.	004-88-039				SHEET 1 OF 1
PRODUCT LEVEL ELEVATION	0.83				DRILLER
TIME	1000				START: TIME 900 / DATE 2/22/89
DATE	2/22/89				FINISH: TIME 1045 / DATE 2/22/89
CASING DEPTH					

DRILLING CONTRACTOR: PC EXPLORATION

DRILLER:

DRILLING METHOD: HOLLOW STEM AUGER

SAMPLING METHOD: 140# HAMMER 30" DROP, MODIFIED CALIFORNIA SAMPLER.

LOGGER: ERIC HOLM

N/S: 2583.3 | E/W: 3153.3 | ELEV.: 14.32

BORING DIAMETER: 6 INCHES | CASING DIAMETER: 2 INCHES

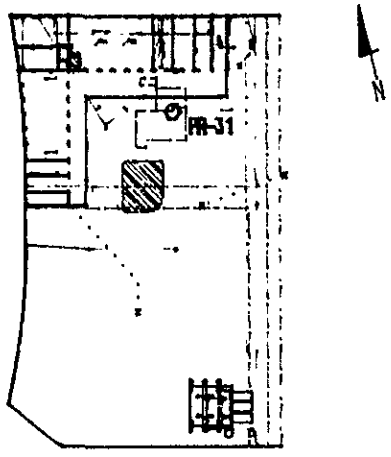
REVIEWED BY: M.A.M. DATE: 8-28-89

DIST. FROM SURF.	WELL CONST. CASING	WELL CONST. ANNULUS	LEGEND	TLV READING	SAMPLE NO.	RECOVERY	BLOWS PER 6 IN.	USCS	LOG OF MATERIAL
									SILTY SAND- RED BROWN, MOIST, MEDIUM DENSE WITH AREAS OF MOTTLING
1		4% BENTONITE CEMENT SLURRY						SM	QUARTZ, MAFICS, STRONG HYDROCARBON ODOR.
2									
3									
4	BLANK					X	7		
						X	8		
5		3/8" BENT. PELLETS		500		X	7		STRONG HYDROCARBON ODOR.
6									
7		COURSE AQUARIUS SAND							
8									
9							9		
							9		
10				10,000		X	11		FLOATING GAS, STRONG HYDROCARBON ODOR.
11									
12	SLOTS								
13									
14							5		
						X	6		
15				1200		X	2		GRADES WET, LOOSE, PRODUCT VISIBLE, STRONG HYDROCARBON ODOR.
									TEST BORING TERMINATED @ 15' ON 2-22-89
									MATERIALS: 1 1/2 BAGS OF SAND
									2/3 5 GALLON BUCKET OF BENTONITE

ANANIA GEOLOGIC ENGINEERING

BORING LOG

LOCATION OF BORING



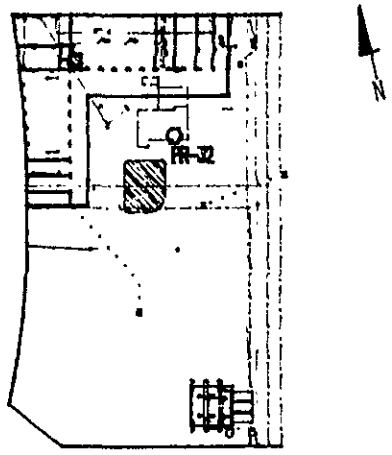
SITE/LOCATION	CARNATION/OAKLAND				BORING NO. PR-31
PROJECT NO.	004-88-059				
PRODUCT LEVEL ELEVATION	0.88				SHEET 1 OF 1
TIME	915				DRILLER
DATE	2/23/89				START: TIME 7:30, DATE 2/23/89
CASING DEPTH					FINISH: TIME 915, DATE 2/23/89
DRILLING CONTRACTOR	PC EXPLORATION				
DRILLER					
DRILLING METHOD	HOLLOW STEM AUGER				
SAMPLING METHOD: 140# HAMMER 30" DROP, MODIFIED CALIFORNIA SAMPLER.					
LOGGER	ERIC HOLM				
N/S 2547.8	E/W 3202.5		ELEV. 14.74		
BORING DIAMETER: 6 INCHES		CASING DIAMETER: 2 INCHES			
REVIEWED BY: M.A.M.			DATE 8-28-89		

DIST. FROM SURF.	WELL CONST. CASING	WELL CONST. ANNULUS	LEGEND	TLV READING	SAMPLE NO.	RECOVERY	BLOWS PER 6 IN.	USCS	LOG OF MATERIAL
									ASPHALTIC CONCRETE
1								GM	SILTY GRAVEL- GRAY BROWN, MOIST, MEDIUM DENSE, ANGULAR (FILL), HYDROCARBON ODOR.
2		4% BENTONITE CEMENT SLURRY							
3									
4	BLANK						8		
						X	8		
5		3/8" BENT. PELLETS		90		X	9		HYDROCARBON ODOR.
6									
7									
8									
9							7		
							9		
10				140		X	10		HYDROCARBON ODOR.
11		COURSE AGGREGATE SAND							
12	0.125" SLOT								
13									
14							9		
						X	11	SM	
15				300		X	11		SILTY SAND- RED BROWN, WET, MEDIUM DENSE WITH LARGE OXIDATION DEPOSITS, QUARTZ, MAFICS, MODERATE HYDROCARBON ODOR.
									TEST BORING TERMINATED @ 15' ON 2-23-89
									PRODUCT ENCOUNTERED
									MATERIALS: 1 1/2 BAGS OF SAND
									2/3 5 GALLON BUCKET OF BENTONITE

ANANIA GEOLOGIC ENGINEERING

BORING LOG

LOCATION OF BORING



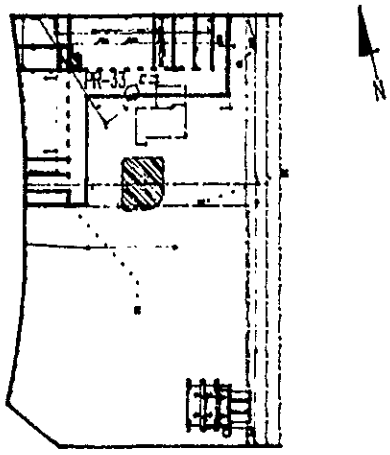
SITE/LOCATION	CARNATION/OAKLAND				BORING NO. PR-32
PROJECT NO.	004-88-059				SHEET 1 OF 1
PRODUCT LEVEL	1.37				DRILLER
TIME	1010				START TIME: 925
DATE	2/23/89				FINISH TIME: 1045
CASING DEPTH					START DATE: 2/23/89
DRILLING CONTRACTOR	PC EXPLORATION				FINISH DATE: 2/23/89
DRILLER					
DRILLING METHOD	HOLLOW STEM AUGER				
SAMPLING METHOD: 140# HAMMER 30" DROP, MODIFIED CALIFORNIA SAMPLER.					
LOGGER	CHRIS NIELSON-CERQUONE				
N/S 2520.9	E/W 3193.8			ELEV. 15.00	
BORING DIAMETER: 6 INCHES			CASING DIAMETER: 2 INCHES		
REVIEWED BY: M.A.M.			DATE 8-28-89		

DIST. FROM SURF.	WELL CONST. CASING	WELL CONST. ANNULUS	LEGEND	TLV READING	SAMPLE NO.	RECOVERY	BLOWS PER 6 IN.	USCS	LOG OF MATERIAL
									ASPHALTIC CONCRETE
1		4% BENTONITE CEMENT SLURRY						GM	
2									SILTY GRAVEL- GRAY BROWN, MOIST, MEDIUM DENSE, ANGULAR (FILL), HYDROCARBON ODOR.
3									
4	BLANK						7		
							8		
5		3/8" BENT. PELLETS		150		X	8		HYDROCARBON ODOR.
6									
7		COURSE AGGREGATE SAND							
8									
							7		
9							9		
10				300		X	9		HYDROCARBON ODOR.
11									
12	0.020" SLOT								
13									
14							9		
						X	10		
15				800		X	10		GRADES WET, SLIGHT HYDROCARBON ODOR
									TEST BORING TERMINATED @ 15' ON 2-23-89
									PRODUCT ENCOUNTERED
									MATERIALS: 1 1/2 BAGS OF SAND
									2/3 5 GALLON BUCKET OF BENTONITE

ANANIA GEOLOGIC ENGINEERING

BORING LOG

LOCATION OF BORING



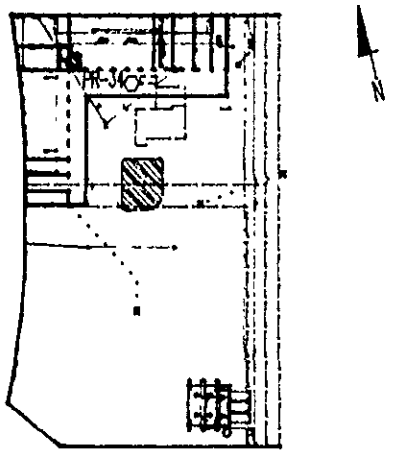
SITE/LOCATION	CARNATION/OAKLAND				BORING NO. PR-33
PROJECT NO.	004-89-059				
PRODUCT LEVEL ELEVATION	0.91				SHEET 1 OF 1
TIME	1200				DRILLER
DATE	2/27/89				START: TIME 1120, DATE 2/27/89
CASING DEPTH					FINISH: TIME 1250, DATE 2/27/89
DRILLING CONTRACTOR	PC EXPLORATION				
DRILLER					
DRILLING METHOD	HOLLOW STEM AUGER				
SAMPLING METHOD: 140# HAMMER 30" DROP, MODIFIED CALIFORNIA SAMPLER.					
LOGGER	CHRIS NIELSON-CERQUONE				
N/S 2579.9	E/W 3162.2			ELEV. 14.53	
BORING DIAMETER: 6 INCHES			CASING DIAMETER: 2 INCHES		
REVIEWED BY: M.A.M.				DATE 6-28-89	

DIST. FROM SURF.	WELL CONST. CASING	WELL CONST. MANHOLE	LEGEND	TLV READING	SAMPLE NO.	RECOVERY	BLOWS PER 6 IN.	USCS	LOG OF MATERIAL
0		4% BENTONITE CEMENT SLURRY						SM	SILTY SAND- GREEN BROWN, DRY TO MOIST, MEDIUM DENSE WITH QUARTZ, MAFICS
1									STRONG HYDROCARBON ODOR.
2									
3									
4	BLANK	3/8" BENT. PELLETS				X	9		
5				2600		X	10		STRONG HYDROCARBON ODOR.
6							10		
7		COARSE AGGREGATE SAND							
8									
9							7		
10				2500		X	7		STRONG HYDROCARBON ODOR.
11						X	8		
12	0.020" SLOT								
13									
14							7		
15				500		X	7		GRADES WITH AREAS OF OXIDATION, WET, STRONG HYDROCARBON ODOR.
									TEST BORING TERMINATED @ 15' ON 2-27-89
									MATERIALS: 1 1/2 BAGS OF SAND
									2/3 5 GALLON BUCKET OF BENTONITE

ANANIA GEOLOGIC ENGINEERING

BORING LOG

LOCATION OF BORING



SITE/LOCATION	CARNATION/OAKLAND				BORING NO. PR-34
PROJECT NO.	004-88-039				SHEET 1 OF 1
PRODUCT LEVEL ELEVATION	0.93				DRILLER
TIME	245				START: TIME 1400, DATE 2/27/89
DATE	2/27/89				FINISH: TIME 1420, DATE 2/27/89
CASING DEPTH					

DRILLING CONTRACTOR: PC EXPLORATION

DRILLER:

DRILLING METHOD: HOLLOW STEM AUGER

SAMPLING METHOD: 140# HAMMER 30" DROP, MODIFIED CALIFORNIA SAMPLER.

LOGGER: CHRIS NIELSON-CERQUONE

N/S 2590.0 | E/W 3164.7 | ELEV. 14.60

BORING DIAMETER: 6 INCHES | CASING DIAMETER: 2 INCHES

REVIEWED BY: MAM. DATE 8-28-89

DIST. FROM SURF.	WELL CONST. CASING	WELL CONST. ANNULUS	LEGEND	TLV READING	SAMPLE NO.	RECOVERY	BLOWS PER 6 IN.	USCS	LOG OF MATERIAL
1		4% BENTONITE CEMENT SLURRY						ML	SANDY SILT- RED BROWN, MOIST, MEDIUM DENSE WITH QUARTZ, MAFICS, SLIGHT HYDROCARBON ODOR.
2									
3									
4	BLANK						7		
						X	9		
5		3/8" BENT. PELLETS		120		X	9		SLIGHT HYDROCARBON ODOR.
6									
7		COURSE AQUARIUM SAND							
8									
9							11		
						X	12		
10				10,000		X	13		COLOR CHANGE TO MOTTLED GREEN GRAY, STRONG HYDROCARBON ODOR.
11									
12	0.020" SLOT								
13									
14							6		
							6		
15				5,600		X	7		GRADES RED BROWN, WET, STRONG HYDROCARBON ODOR.

TEST BORING TERMINATED @ 15' ON 2-27-89

PRODUCT ENCOUNTERED

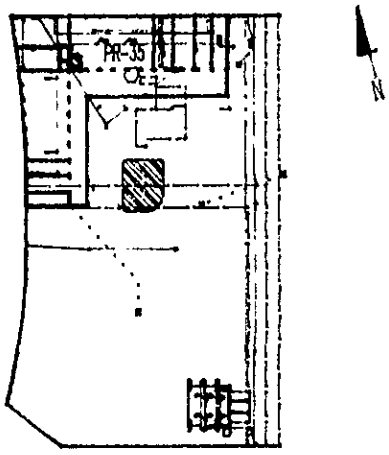
MATERIALS: 1 2/3 BAGS OF SAND

2/3 5 GALLON BUCKET OF BENTONITE

ANANIA GEOLOGIC ENGINEERING

BORING LOG

LOCATION OF BORING



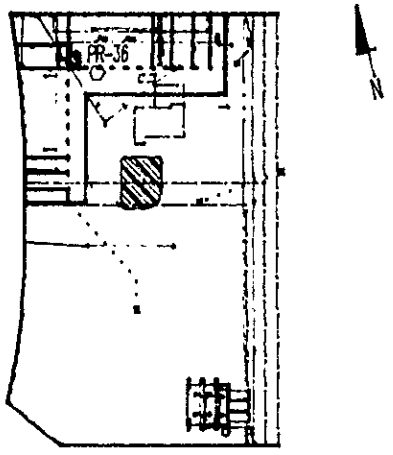
SITE/LOCATION	CARNATION/OAKLAND				BORING NO. PR-35
PROJECT NO.	004-88-059				
PRODUCT LEVEL ELEVATION	0.99				SHEET 1 OF 1
TIME	1420				DRILLER
DATE	2/27/89				START TIME 1330 / FINISH TIME 1505
CASING DEPTH					DATE 2/27/89 / DATE 2/27/89
DRILLING CONTRACTOR	PC EXPLORATION				
DRILLER					
DRILLING METHOD	HOLLOW STEM AUGER				
SAMPLING METHOD: 140# HAMMER 30" DROP, MODIFIED CALIFORNIA SAMPLER.					
LOGGER	ERIC HOLM				
N/S 2600.3	E/W 3168.4		ELEV. 14.61		
BORING DIAMETER: 6 INCHES		CASING DIAMETER: 2 INCHES			
REVIEWED BY: M.A.M.			DATE 8-28-89		

DIST. FROM SURF.	WELL CONST. CASING	WELL CONST. ANNULUS	LEGEND	TLV READING	SAMPLE NO.	RECOVERY	BLOWS PER 6 IN.	USCS	LOG OF MATERIAL
								SM	SILTY SAND- RED BROWN, DRY TO MOIST, MEDIUM DENSE WITH AREAS OF
1									OXIDATION, QUARTZ, MAFICS, STRONG HYDROCARBON ODOR.
2		4% BENTONITE CEMENT SLURRY							
3									
4	BLANK					X	8		
						X	9		
5		3/8" BENT. PELLETS		4,000		X	10		STRONG HYDROCARBON ODOR.
6									
7									
8									
9							7		
						X	8		
10				10,000		X	10		STRONG HYDROCARBON ODOR.
11		COARSE AQUARIUS SAND							
12	0.020" SLOT								
13									
14							6		
							8		
15				300		X	11		COLOR CHANGE TO GREEN BROWN, GRADES WITH INCREASING SAND, WET,
									STRONG HYDROCARBON ODOR.
									TEST BORING TERMINATED @ 15' ON 2-27-89
									PRODUCT ENCOUNTERED
									MATERIALS: 1 1/2 BAGS OF SAND
									2/3 5 GALLON BUCKET OF BENTONITE

ANANIA GEOLOGIC ENGINEERING

BORING LOG

LOCATION OF BORING



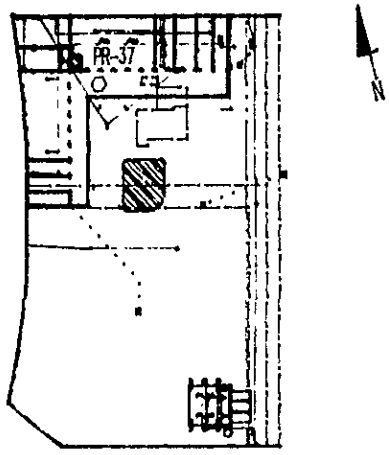
SITE/LOCATION	CARNATION/OAKLAND				BORING NO. PR-36
PROJECT NO.	004-89-059				SHEET 1 OF 1
PRODUCT LEVEL ELEVATION	0.80				DRILLER
TIME	7:45				START TIME: 7:00
DATE	3/1/89				FINISH TIME: 8:05
CASING DEPTH					START DATE: 3/1/89
DRILLING CONTRACTOR	PC EXPLORATION				FINISH DATE: 3/1/89
DRILLER					
DRILLING METHOD	HOLLOW STEM AUGER				
SAMPLING METHOD: 140# HAMMER 30" DROP, MODIFIED CALIFORNIA SAMPLER.					
LOGGER	ERIC HOLM				
N/S 2611.5	E/W 3130.4			ELEV. 14.39	
BORING DIAMETER: 6 INCHES			CASING DIAMETER: 2 INCHES		
REVIEWED BY: M.A.M.			DATE 9-28-89		

DIST. FROM SURF.	WELL CONST. CASING	WELL CONST. ANNULUS	LEGEND	TLV READING	SAMPLE NO.	RECOVERY	BLOWS PER 6 IN.	USCS	LOG OF MATERIAL
0								SM	SILTY SAND- RED BROWN, DRY TO MOIST, MEDIUM DENSE WITH AREAS OF
1		4% BENTONITE CEMENT SLURRY							OXIDATION, QUARTZ, MAFICS, STRONG HYDROCARBON ODOR.
2									
3									
4	BLANK						8		
						X	9		
5		3/8" BENT. PELLETS		1,200		X	10		STRONG HYDROCARBON ODOR.
6									
7									
8									
9							10		
						X	10		
10				10,000		X	10		STRONG HYDROCARBON ODOR.
11									
12	0.125" SLOT	COURSE AGUARDIA SAND							
13									
14							8		
						X	9		
15				110		X	11		GRADES WET WITH INCREASING SAND CONTENT, STRONG HYDROCARBON ODOR.
									TEST BORING TERMINATED @ 15' ON 3-1-89
									PRODUCT ENCOUNTERED
									MATERIALS: 1 1/2 BAGS OF SAND
									2/3 5 GALLON BUCKET OF BENTONITE

ANANIA GEOLOGIC ENGINEERING

BORING LOG

LOCATION OF BORING



SITE/LOCATION	CARNATION/OAKLAND				BORING NO. PR-37
PROJECT NO.	004-88-059				
PRODUCT LEVEL ELEVATION	0.69				SHEET 1 OF 1
TIME	940				DRILLER
DATE	3/1/89				START: TIME 905, DATE 3/1/89
CASING DEPTH					FINISH: TIME 900, DATE 3/1/89

DRILLING CONTRACTOR: PC EXPLORATION

DRILLER:

DRILLING METHOD: HOLLOW STEM AUGER

SAMPLING METHOD: 140# HAMMER 30" DROP, MODIFIED CALIFORNIA SAMPLER.

LOGGER: ERIC HELM

N/S: 2602.1 | E/W: 3127.6 | ELEV.: 14.55

BORING DIAMETER: 6 INCHES | CASING DIAMETER: 2 INCHES

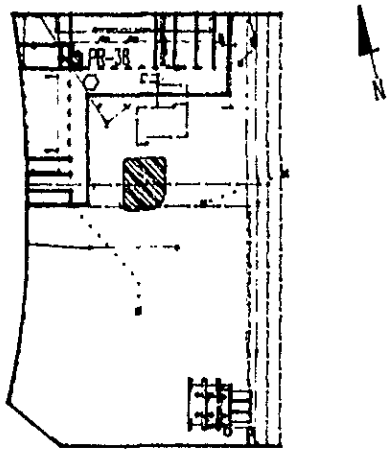
REVIEWED BY: M.A.M. DATE: 8-28-89

DIST. FROM SURF.	WELL CONST. CASING	WELL CONST. ANNULUS	LEGEND	TLV READING	SAMPLE NO.	RECOVERY	BLOWS PER 6 IN.	USCS	LOG OF MATERIAL
1		4% BENTONITE CEMENT SLURRY						SM	SILTY SAND- RED BROWN, DRY TO MOIST, MEDIUM DENSE. WITH QUARTZ, MAFICS.
									STRONG HYDROCARBON ODOR.
2									
3									
4	BLANK					X	5		
						X	5		
5		3/8" BENT. PELLETS		200		X	7		STRONG HYDROCARBON ODOR.
6									
7									
8									
9							6		
							7		
10				7,800		X	8		COLOR CHANGE TO GREEN GRAY, AREAS OF OXIDATION, STRONG HYDROCARBON ODOR.
11		COURSE AGGREGATE SAND							
12	RISER SLOT								
13									
14						X	6		
						X	8		
15				320		X	8		STRONG HYDROCARBON ODOR.
									TEST BORING TERMINATED @ 15' ON 3-1-89
									PRODUCT ENCOUNTERED
									MATERIALS: 1 3/4 BAGS OF SAND
									2/3 5 GALLON BUCKET OF BENTONITE

ANANIA GEOLOGIC ENGINEERING

BORING LOG

LOCATION OF BORING



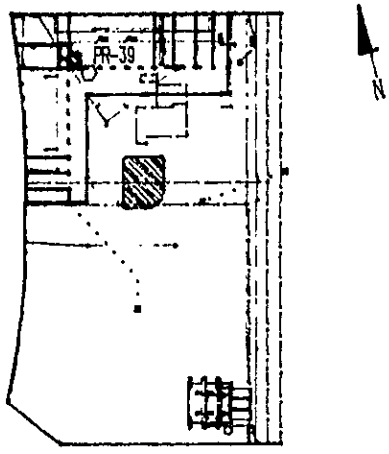
SITE/LOCATION	CARNATION/OAKLAND				BORING NO. PR-38
PROJECT NO.	004-88-059				
PRODUCT LEVEL ELEVATION	0.89				SHEET 1 OF 1
TIME	9:30				DRILLER
DATE	3/1/89				START: TIME 9:05, DATE 3/1/89
CASING DEPTH					FINISH: TIME 9:55, DATE 3/1/89
DRILLING CONTRACTOR	PC EXPLORATION				
DRILLER					
DRILLING METHOD	HOLLOW STEM AUGER				
SAMPLING METHOD: 140# HAMMER 30" DROP, MODIFIED CALIFORNIA SAMPLER.					
LOGGER	ERIC HOLM				
N/S 2684.9	E/W 3118.3			ELEV. 14.57	
BORING DIAMETER: 6 INCHES			CASING DIAMETER: 2 INCHES		
REVIEWED BY: M.A.M.				DATE 8-28-89	

DIST. FROM SURF.	WELL CONST. CASING	WELL CONST. ANNULUS	LEGEND	TLV READING	SAMPLE NO.	RECOVERY	BLOWS PER 6 IN.	USCS	LOG OF MATERIAL
1		4% BENTONITE CEMENT SLURRY						SM	SILTY SAND- MOTTLED RED BROWN AND GREEN (STAINED), MOIST, MEDIUM DENSE WITH AREAS OF OXIDATION, QUARTZ, MAFICS, HYDROCARBON ODOR.
2									
3									
4	BLANK					X	5		
		3/8" BENT. PELLETS				X	6		
5				170		X	7		HYDROCARBON ODOR.
6									
7		COURSE AQUARIUS SAND							
8									
9							9		
						X	10		
10				10,000		X	13		HYDROCARBON ODOR.
11									
12	.125" SLOT								
13									
14							4		
						X	5		
15				100		X	7		STRONG HYDROCARBON ODOR.
									TEST BORING TERMINATED @ 15' ON 3-1-89.
									MATERIALS: 1 1/2 BAGS OF SAND
									2/3 5 GALLON BUCKET OF BENTONITE

ANANIA GEOLOGIC ENGINEERING

BORING LOG

LOCATION OF BORING



SITE/LOCATION	CARNATION/OAKLAND				BORING NO. PR-39
PROJECT NO.	004-88-059				SHEET 1 OF 1
PRODUCT LEVEL ELEVATION	0.89				DRILLER
TIME	1030				START: TIME 1005; DATE 3/1/89
DATE	3/1/89				FINISH: TIME 1100; DATE 3/1/89
CASING DEPTH					

DRILLING CONTRACTOR: PC EXPLORATION

DRILLER:

DRILLING METHOD: HOLLOW STEM AUGER

SAMPLING METHOD: 140# HAMMER 30" DROP, MODIFIED CALIFORNIA SAMPLER.

LOGGER: ERIC HOLM

N/S: 2614.5 | E/W: 3120.9 | ELEV.: 14.61

BORING DIAMETER: 6 INCHES | CASING DIAMETER: 2 INCHES

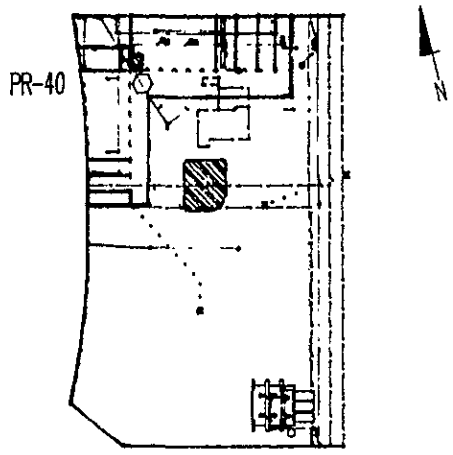
REVIEWED BY: M.A.M. DATE: 8-28-89

DIST. FROM SURF.	WELL CONST. CASING	WELL CONST. ANNULUS	LEGEND	TLV READING	SAMPLE NO.	RECOVERY	BLOWS PER 6 IN.	USCS	LOG OF MATERIAL
0		4% BENTONITE CEMENT SLURRY						SM	SILTY SAND- RED BROWN, MOIST, MEDIUM DENSE WITH QUARTZ, MAFICS, AND
1									AREAS OF OXIDATION.
2									
3									
4	BLANK					X	9		
4		3/8" BENT. PELLETS				X	5		
5				670		X	5		STRONG HYDROCARBON ODOR.
6									
7		COURSE AQUARIUS SAND							
8									
9							7		
9							10		
10				10,000		X	13		GRADES WITH TRACE GRAVEL, STRONG HYDROCARBON ODOR.
11									
12	0.125" SLOT								
13									
14							8		
14							9		
15				100		X	9		COLOR CHANGES TO GRAY GREEN, HYDROCARBON ODOR.
									TEST BORING TERMINATED @ 15' ON 3-1-89
									MATERIALS: 1 2/3 BAGS OF SAND
									2/3 5 GALLON BUCKET OF BENTONITE

ANANIA GEOLOGIC ENGINEERING

BORING LOG

LOCATION OF BORING



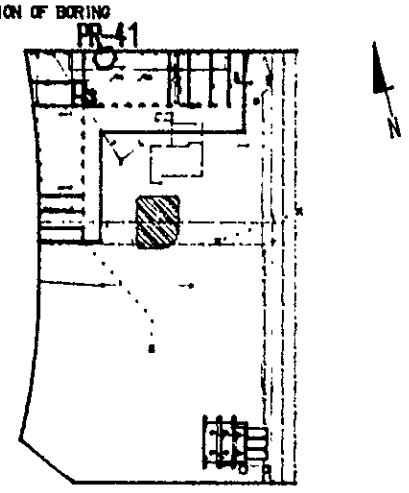
SITE/LOCATION	CARNATION/OAKLAND				BORING NO. PR-40
PROJECT NO.	004-88-059				
WATER LEVEL ELEVATION	0.94				SHEET 1 OF 1
TIME	11:50				DRILLER
DATE	3/1/89				START / FINISH
CASING DEPTH					TIME 11:05 / TIME 12:15
DRILLING CONTRACTOR	PC EXPLORATION				DATE 3/1/89 / DATE 3/1/89
DRILLER					
DRILLING METHOD	HOLLOW STEM AUGER				
SAMPLING METHOD: 140# HAMMER 30" DROP, MODIFIED CALIFORNIA SAMPLER.					
LOGGER	ERIC HOLM				
N/S 2608.2	E/W 3108.4		ELEV. 14.65		
BORING DIAMETER: 6 INCHES			CASING DIAMETER: 2 INCHES		
REVIEWED BY: M.A.M.			DATE: 8-28-89		

DIST. FROM SURF.	WELL CONST. CASING	WELL CONST. ANNULUS	LEGEND	TLV READING	SAMPLE NO.	RECOVERY	BLOWS PER 6 IN.	USCS	LOG OF MATERIAL
								SM	SILTY SAND- RED BROWN, DRY TO MOIST, MEDIUM DENSE WITH AREAS OF OXIDATION, QUARTZ, MAFICS, HYDROCARBON ODOR.
1		4% BENTONITE CEMENT SLURRY							
2									
3									
4	BLANK					X	5		
						X	5		
5		3/8" BENT. PELLETS		520		X	6		HYDROCARBON ODOR.
6									
7									
8									
9							10		
						X	10		
10				100		X	10		HYDROCARBON ODOR.
11		COURSE AQUARIUM SAND							
12	0.125" SLOT								
13									
14							8		
						X	9		
15				600		X	12		COLOR CHANGE TO GRAY GREEN, GRADES WET, HYDROCARBON ODOR.
									TEST BORING TERMINATED @ 15' ON 3-1-89
									MATERIALS: 1 3/4 BAGS OF SAND
									2/3 5 GALLON BUCKET OF BENTONITE

ANANIA GEOLOGIC ENGINEERING

BORING LOG

LOCATION OF BORING



SITE/LOCATION	CARNATION/OAKLAND				BORING NO. PR-41
PROJECT NO.	004-88-059				SHEET 1 OF 1
WATER LEVEL					DRILLER
TIME					START TIME 12:00 / FINISH TIME 12:50
DATE					START DATE 4-26-89 / FINISH DATE 4-26-89
CASING DEPTH					

DRILLING CONTRACTOR

DRILLER MIKE MOORE

DRILLING METHOD HOLLOW STEM AUGER

SAMPLING METHOD 140# HAMMER 30" DROP, MODIFIED CALIFORNIA SAMPLER.

LOGGER CHRIS NIELSON-CERQUONE

N/S 2869.8 E/W 3140.0 ELEV. 14.43

BORING DIAMETER: WELL CASING DIAMETER:

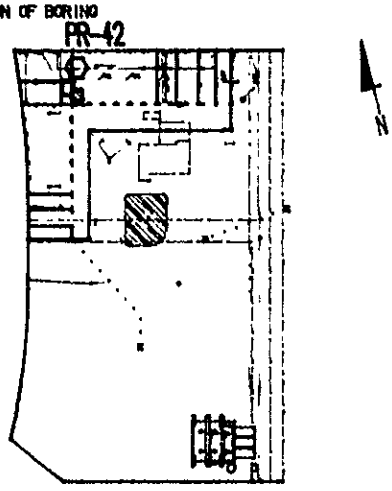
REVIEWED BY: M.A.M. DATE 6-29-89

DIST. FROM SURF.	WELL CONST. CASING	WELL CONST. ANNULUS	LEGEND	TLV READING	SAMPLE NO.	RECOVERY	BLOWS PER 6 IN.	USCS	LOG OF MATERIAL
									PORTLAND CEMENT CONCRETE
1		4" BENTONITE CEMENT SLURRY							SANDY GRAVEL
									SANDY SILT- BLACK TO DARK BROWN, MOIST, MEDIUM STIFF WITH TRACE
2								ML	GRAVEL, SEWAGE ODOR.
3	BLANK								
4		3/8" BENT. PELL							
5				3					SILTY SAND- MOTTLED GREEN/GRAY, MOIST, MEDIUM DENSE.
6									
7									
8									GRADES MOIST TO WET.
9	0.030 INCH SLOT	3/4" SAND							GRADES WET
10				38					
11									
12								SM	
13									COLOR CHANGE TO YELLOW BROWN.
14									
15				10000					
									TEST BORING TERMINATED @ 15' ON 4-26-89
									MATERIALS: 2 BAGS OF SAND
									1/2 5 GALLON BUCKET OF BENTONITE

ANANIA GEOLOGIC ENGINEERING

BORING LOG

LOCATION OF BORING



SITE/LOCATION	CARNATION/OAKLAND				BORING NO. PR-42
PROJECT NO.	004-68-059				SHEET 1 OF 1
WATER LEVEL					DRILLER
TIME					START TIME 13:00 / FINISH TIME 13:45
DATE					DATE 4-26-89 / DATE 4-26-89
CASING DEPTH					

DRILLING CONTRACTOR

DRILLER MIKE MOORE

DRILLING METHOD HOLLOW STEM AUGER

SAMPLING METHOD: 140# HAMMER 30" DROP, MODIFIED CALIFORNIA SAMPLER.

LOGGER CHRIS NIELSON-CERQUONE

N/S 2882.6 E/W 3118.3 ELEV. 14.49

BORING DIAMETER: 6 INCHES WELL CASING DIAMETER: 2 INCHES

REVIEWED BY: M.A.M. DATE 6-29-89

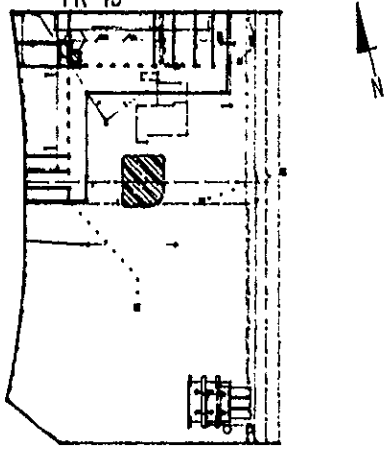
DIST. FROM SURF.	WELL CONST. CASING	WELL CONST. ANNULUS	LEGEND	TLV READING	SAMPLE NO.	RECOVERY	BLOWS PER 6 IN.	USCS	LOG OF MATERIAL
									PORTLAND CEMENT CONCRETE
1		4# BENTONITE CEMENT SLURRY						ML	SANDY GRAVEL
2	BLANK								SILTY SAND- BLACK TO DARK BROWN, MOIST, MEDIUM STIFF, SEWAGE AND HYDROCARBON ODOR.
3		3/8" BENT. PELL.							
4								SM	SILTY SAND- GRAY TO GREEN BROWN, DRY TO MOIST, MEDIUM DENSE, HYDROCARBON ODOR.
5									
6									
7									
8									GRADES MOIST TO WET
9	0.030 INCH SLOT								GRADES WET
10		#3 SAND							
11									
12									
13									COLOR CHANGE TO YELLOW BROWN.
14									
15				200					TEST BORING TERMINATED @ 15' ON 4-26-89

ANANIA GEOLOGIC ENGINEERING

BORING LOG

LOCATION OF BORING

PR-43



SITE/LOCATION	CARNATION/OAKLAND				BORING NO. PR-43
PROJECT NO.	004-88-059				
WATER LEVEL					SHEET 1 OF 1
TIME					DRILLER
DATE					START / FINISH
CASING DEPTH					TIME 14:00 / TIME 15:30
DRILLING CONTRACTOR					DATE 4-26-89 / DATE 4-26-89
DRILLER	MIKE MOORE				
DRILLING METHOD	HOLLOW STEM AUGER				

SAMPLING METHOD: 140# HAMMER 30" DROP, MODIFIED CALIFORNIA SAMPLER.

LOGGER CHRIS NIELSON-CERQUONE

N/S 2650.6 E/W 3118.3 ELEV. 14.53

BORING DIAMETER: 6 INCHES WELL CASING DIAMETER: 2 INCHES

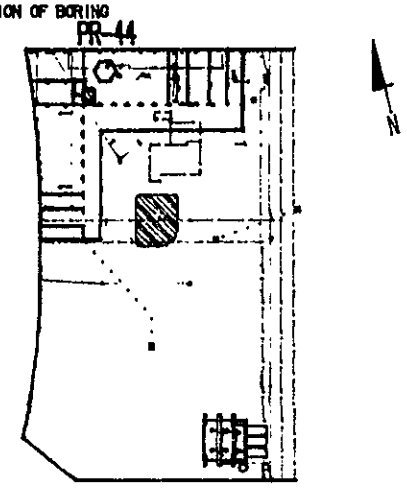
REVIEWED BY: M.A.M. DATE 8-29-89

DIST. FROM SURF.	WELL CONST. CASING	WELL CONST. ANNULUS	LEGEND	TLV READING	SAMPLE NO.	RECOVERY	BLOWS PER 6 IN.	USCS	LOG OF MATERIAL
									PORTLAND CEMENT CONCRETE
								GP	SANDY GRAVEL
1								ML	SANDY SILT- BLACK, MOIST, MEDIUM STIFF, SEWAGE AND HYDROCARBON ODOR.
2	BLANK	4sk BENTONITE CEMENT SLURRY							
3									
		3/8" BENT. PELL.							
4								SM	SILTY SAND- GREEN/GRAY, MOIST, MEDIUM DENSE, STRONG SEWAGE ODOR.
5				3					
6									
7									GRADES WET TO MOIST.
8									
9	0.030 INCH SLOT	3# SAND							GRADES WET
10				15					
11									
12									
13									COLOR CHANGE TO YELLOW BROWN.
14									
15									TEST BORING TERMINATED @ 15' ON 4-26-89

ANANIA GEOLOGIC ENGINEERING

BORING LOG

LOCATION OF BORING



SITE/LOCATION	CARNATION/OAKLAND				BORING NO. PR-44
PROJECT NO.	004-88-059				SHEET 1 OF 1
WATER LEVEL					DRILLER
TIME					START TIME 7:45 / FINISH TIME 8:45
DATE					DATE 4-27-89 / DATE 4-27-89
CASING DEPTH					

DRILLING CONTRACTOR

DRILLER MIKE MOORE

DRILLING METHOD HOLLOW STEM AUGER

SAMPLING METHOD: 140# HAMMER 30" DROP, MODIFIED CALIFORNIA SAMPLER.

LOGGER CHRIS NIELSON-CERQUONE

N/S 2852.2 | E/W 3135.8 | ELEV. 14.59

BORING DIAMETER: 6 INCHES | WELL CASING DIAMETER: 2 INCHES

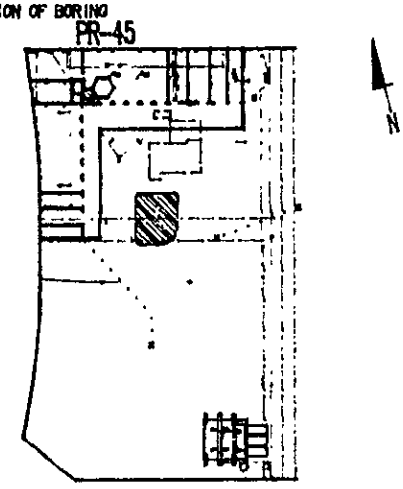
REVIEWED BY: M.A.M. DATE 5-29-89

DIST. FROM SURF.	WELL CONST. CASING	WELL CONST. ANNULUS	LEGEND	TLV READING	SAMPLE NO.	RECOVERY	BLOWS PER 6 IN.	USCS	LOG OF MATERIAL
									PORTLAND CEMENT CONCRETE
1								GP	SANDY GRAVEL- GRAY, MOIST, MEDIUM DENSE.
								ML	SANDY SILT- BLACK TO GRAY BROWN, MOIST, MEDIUM STIFF WITH HYDROCARBON AND SEWAGE ODOR.
2	BLANK	4# BENTONITE CEMENT SLURRY							
3									
		3/8" BENT. PELL.							
4									SILTY SAND- GREEN AND GRAY, MOIST, MEDIUM DENSE, HYDROCARBON ODOR.
								SM	
5				10					
6									
7									
8									
9	0.030 INCH SLOT	3# SAND							
10				25					
									COLOR CHANGE TO YELLOW BROWN, GRADES WET.
11									
12									
13									
14									
15				200					
									TEST BORING TERMINATED @ 15' ON 4-27-89

ANANIA GEOLOGIC ENGINEERING

BORING LOG

LOCATION OF BORING



SITE/LOCATION	CARNATION/OAKLAND				BORING NO. PR-45
PROJECT NO.	004-88-069				SHEET 1 OF 1
WATER LEVEL					DRILLER
TIME					START TIME / FINISH TIME
DATE					
CASING DEPTH					DATE 4-27-89 / DATE 4-27-89

DRILLING CONTRACTOR

DRILLER MIKE MOORE

DRILLING METHOD HOLLOW STEM AUGER

SAMPLING METHOD: 140# HAMMER 30" DROP, MODIFIED CALIFORNIA SAMPLER.

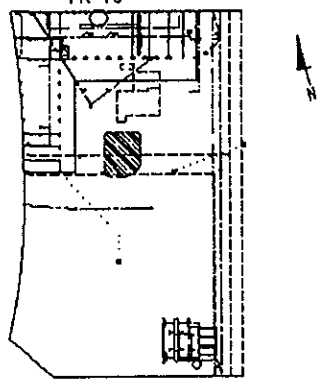
LOGGER CHRIS NIELSON-CERQUONE

N/S 2633.3 E/W 3129.7 ELEV. 14.50

BORING DIAMETER: 6 INCHES WELL CASING DIAMETER: 2 INCHES

REVIEWED BY: M.A.M. DATE 8-29-89

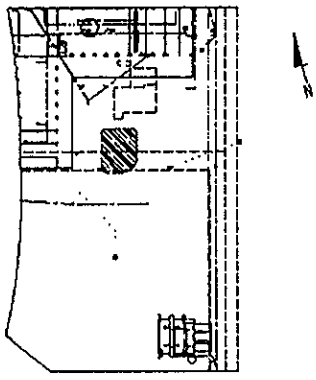
DIST. FROM SURF.	WELL CONST. CASING	WELL CONST. ANNULUS	LEGEND	TLV READING	SAMPLE NO.	RECOVERY	BLOWS PER 6 IN.	USCS	LOG OF MATERIAL
									PORTLAND CEMENT CONCRETE
1		4% BENTONITE CEMENT SLURRY						ML	SANDY SILT- BLACK, DRY TO MOIST, MEDIUM STIFF, SLIGHT HYDROCARBON ODOR.
2									
3	BLANK	3/8" BENT. PELL						SM	SILTY SAND- GREEN TO GRAY BROWN, DRY TO MOIST, MEDIUM DENSE, HYDROCARBON ODOR.
4									
5				3					
6									
7									
8									
9	0.020 INCH SLOT	3/4 SAND							GRADES MOIST TO WET.
10				3					
11									
12									COLOR CHANGE TO YELLOW BROWN, GRADES WET.
13									
14									
15				220					TEST BORING TERMINATED @ 15' ON 8-29-89



ANANIA GEOLOGIC ENGINEERING — BORING LOG

SITE/LOCATION	CARNATION/OAKLAND				BORING NO. PR-46
PROJECT NO.	004-88-059				SHEET 1 of 1
WATER LEVEL					DRILLER
TIME					START: TIME
DATE					FINISH: TIME
CASING DEPTH					
DRILLING CONTRACTOR					
DRILLER	MIKE MOORE				DATE: 4-27-89 / DATE: 4-27-89
DRILLING METHOD	HOLLOW STEM AUGER				
SAMPLING METHOD	140# HAMMER 30" DROP, MODIFIED CALIFORNIA SAMPLER.				
LOGGER	CHRIS NIELSON-CERQUONE				
N/S	2663.6	E/W	3163.2	ELEV.	14.51
BORING DIAMETER:	6 INCHES	WELL CASING DIAMETER:	2 INCHES		

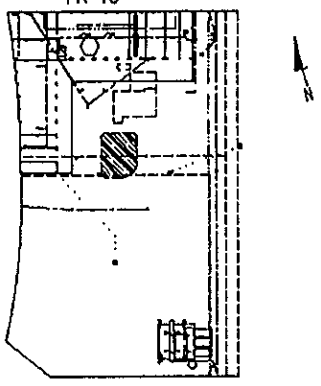
DIST. FROM SURF.	WELL CONST. CASING	WELL CONST. ANNULUS	LEGEND	TLV READING	SAMPLE NO.	RECOVERY	BLOWS PER 6 IN.	USCS	LOG OF MATERIAL
									PORTLAND CEMENT CONCRETE
								GP	SANDY GRAVEL- GRAY, MOIST, MEDIUM DENSE.
1		4% BENTONITE CEMENT SLURRY						ML	SANDY SILT- BLACK, DRY TO MOIST, MEDIUM STIFF, HYDROCARBON ODOR.
2									
	BLANK								
3		3/8" BENT. PELL							SILTY SAND- GRAY/GREEN BROWN, DRY TO MOIST, MEDIUM DENSE, STRONG
4									HYDROCARBON ODOR.
				10					
5									
6									
7								SM	
8									
9									
	0.030 INCH SLOT	3/4 SAND		5					
10									
11									
12									
13									
14									
15									TEST BORING TERMINATED @ 15' ON 4-27-89



ANANIA GEOLOGIC ENGINEERING — BORING LOG

SITE/LOCATION	CARNATION/OAKLAND				BORING NO. PR-47
PROJECT NO.	004-88-059				SHEET 1 of 1
WATER LEVEL					DRILLER
TIME					START: TIME
DATE					FINISH: TIME
CASING DEPTH					
DRILLING CONTRACTOR					
DRILLER	MIKE MOORE				DATE 4-27-89
DRILLING METHOD	HOLLOW STEM AUGER				DATE 4-27-89
SAMPLING METHOD	140# HAMMER 30" DROP, MODIFIED CALIFORNIA SAMPLER				
LOGGER	CHRIS NIELSON-CERQUONE				
N/S	2645.4	E/W	3153.8	ELEV.	14.41
BORING DIAMETER:	6 INCHES	WELL CASING DIAMETER:	2 INCHES		

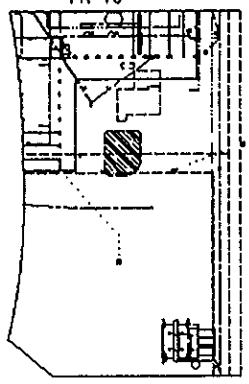
DIST. FROM SURF.	WELL CONST. CASING	WELL CONST. ANNULUS	LEGEND	TLV READING	SAMPLE NO.	RECOVERY	BLOWS PER 6 IN.	USCS	LOG OF MATERIAL
									PORTLAND CEMENT CONCRETE
								GP	SANDY GRAVEL- GRAY, MOIST, MEDIUM DENSE
1		4% BENTONITE CEMENT SLURRY						ML	SANDY SILT- BLACK, DRY TO MOIST, MEDIUM STIFF.
2									
	BLANK								
3									
		3/8" BENT. PELL							
4									SILTY SAND- GRAY BROWN, MOIST, MEDIUM DENSE, STRONG HYDROCARBON ODOR.
									HIT CONCRETE OBSTRUCTION, VERY STRONG SEWAGE ODOR PRESENT.
5									
6									
7								SM	
8									HIT OBSTRUCTION.
9									CONTINUED DRILLING WITH NO CUTTINGS COMING TO SURFACE. WHEN
	0.030 INCH SLOT								AUGER WAS PULLED OUT THERE WAS A STRONG LEACHATE ODOR.
10		3/4 SAND							
11									
12									
13									
14									
15									
									TEST BORING TERMINATED @ 15' ON 4-27-89



ANANIA GEOLOGIC ENGINEERING — BORING LOG

SITE/LOCATION	CARNATION/OAKLAND
PROJECT NO.	004-88-059
BORING NO.	PR-48
SHEET	1 of 1
WATER LEVEL	
TIME	
DATE	
CASING DEPTH	
DRILLER	START / FINISH
DRILLING CONTRACTOR	
DRILLER	MIKE MOORE
TIME	12:30 / 13:45
DRILLING METHOD	HOLLOW STEM AUGER
DATE	4-27-89 / 4-27-89
SAMPLING METHOD	140# HAMMER 30" DROP, MODIFIED CALIFORNIA SAMPLER.
LOGGER	CHRIS NIELSON-CERQUONE
N/S	2627.1
E/W	3148.9
ELEV.	14.57
BORING DIAMETER:	6 INCHES
WELL CASING DIAMETER:	2 INCHES

DIST. FROM SURF.	WELL CONST. CASING	WELL CONST. ANNULUS	LEGEND	TLV READING	SAMPLE NO.	RECOVERY	BLOWS PER 6 IN.	USCS	LOG OF MATERIAL
									PORTLAND CEMENT CONCRETE
								GP	SANDY GRAVEL- MOIST, MEDIUM DENSE
1		4x BENTONITE CEMENT SLURRY						ML	SANDY SILT- BLACK, DRY, SOFT, SLIGHT HYDROCARBON ODOR.
2									
	BLANK								
3		3/8" BENT. PELL							
4									SILTY SAND- GRAY/GREEN BROWN, MOIST, MEDIUM DENSE, MODERATE HYDROCARBON ODOR.
5									
6									
7								SM	COLOR CHANGE TO BROWN AND MOTTLED GREEN GRAY.
8									
9	0.030 INCH SLOT	3/4 SAND							COLOR CHANGE TO BROWN, GRADES WET, STRONG HYDROCARBON
10									ODOR.
11									
12									
13									
14									
15									TEST BORING TERMINATED @ 15' ON 4-27-89

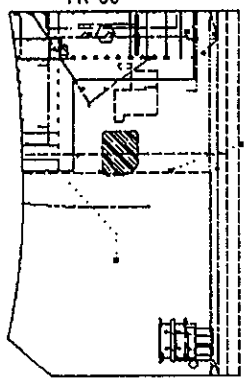


ANANIA GEOLOGIC ENGINEERING — BORING LOG

SITE/LOCATION	CARNATION/OAKLAND				BORING NO.	PR-49
PROJECT NO.	004-88-059				SHEET	1 of 1
WATER LEVEL					DRILLER	
TIME					START	FINISH
DATE					TIME	TIME
CASING DEPTH					13:30	14:20
DRILLING CONTRACTOR					DATE	DATE
DRILLER	MIKE MOORE				4-27-89	4-27-89
DRILLING METHOD	HOLLOW STEM AUGER					
SAMPLING METHOD	140# HAMMER 30" DROP, MODIFIED CALIFORNIA SAMPLER					
LOGGER	CHRIS NIELSON-CERQUONE					
N/S	2652.3	E/W	3179.1	ELEV.	14.50	
BORING DIAMETER:	6 INCHES	WELL CASING DIAMETER:	2 INCHES			

DIST. FROM SURF.	WELL CONST. CASING	WELL CONST. ANNULUS	LEGEND	TLV READING	SAMPLE NO.	RECOVERY	BLOWS PER 6 IN.	USCS	LOG OF MATERIAL DATE: 8-24-89
									PORTLAND CEMENT CONCRETE
								GP	
1		4% BENTONITE CEMENT SLURRY						ML	SANDY GRAVEL- MOIST, MEDIUM DENSE.
									SANDY SILT- BLACK, DRY, MEDIUM STIFF, HYDROCARBON ODOR.
2									
	BLANK								
3		3/8" BENT. PELL						SM	SILTY SAND- MOTTLED BROWN AND GRAY GREEN, MOIST MEDIUM DENSE.
4									
5									
6									
7									
8									
9	0.030 INCH SLOT	3# SAND							
									COLOR CHANGE TO YELLOW BROWN, GRADES WET.
10									
11									
12									
13									
14									
15									TEST BORING TERMINATED @ 15' ON 4-27-89

PR-50

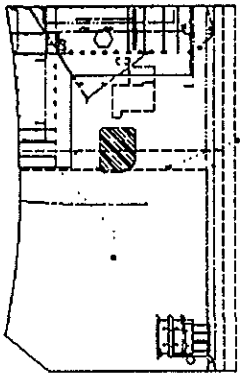


ANANIA GEOLOGIC ENGINEERING — BORING LOG

SITE/LOCATION	CARNATION/OAKLAND				BORING NO.	
PROJECT NO.	004-88-059				PR-50	
WATER LEVEL					SHEET	1 of 1
TIME					DRILLER	
DATE					START	FINISH
CASING DEPTH					TIME	TIME
					14:30	
DRILLING CONTRACTOR					DATE	DATE
DRILLER	MIKE MOORE				4-27-89	4-27-89
DRILLING METHOD	HOLLOW STEM AUGER					
SAMPLING METHOD	140# HAMMER 30" DROP, MODIFIED CALIFORNIA SAMPLER					
LOGGER	CHRIS NIELSON-CERQUONE					
N/S	2635.6	E/W	3173.2	ELEV.	14.37	
BORING DIAMETER:	6 INCHES	WELL CASING DIAMETER:	2 INCHES			

DIST. FROM SURF.	WELL CONST. CASING	WELL CONST. ANNULUS	LEGEND	TLV READING	SAMPLE NO.	RECOVERY	BLOWS PER 6 IN.	USCS	LOG OF MATERIAL
									PORTLAND CEMENT CONCRETE
								GP	
1		4% BENTONITE CEMENT SLURRY						ML	SANDY GRAVEL- MOIST, MEDIUM DENSE
									SANDY SILT- BLACK, DRY, MEDIUM STIFF.
2									
	BLANK								
3									
		3/8" BENT. PELL							SILTY SAND- MOTTLED GRAY GREEN AND BROWN, MOIST, MEDIUM DENSE, STRONG
4									SEWAGE AND HYDROCARBON ODOR.
5									
6									
7								SM	
8									
9									
	0.030 INCH SLOT								
10		3# SAND							
11									
12									COLOR CHANGE TO YELLOW BROWN, GRADES WET.
13									
14									
15									TEST BORING TERMINATED @ 15' ON 4-27-89

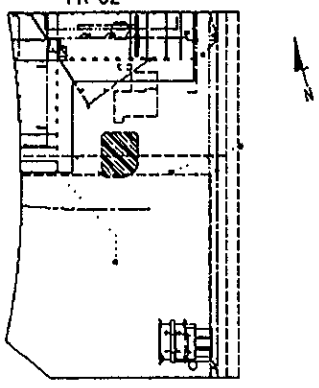
PR-51



ANANIA GEOLOGIC ENGINEERING — BORING LOG

SITE/LOCATION	CARNATION/OAKLAND				BORING NO.	
PROJECT NO.	004-88-059				PR-51	
WATER LEVEL					SHEET 1 of 1	
TIME					DRILLER	
DATE					START	FINISH
CASING DEPTH					TIME 10:15	TIME
DRILLING CONTRACTOR						
DRILLER	MIKE MOORE				DATE 4-28-89	DATE 4-28-89
DRILLING METHOD	HOLLOW STEM AUGER					
SAMPLING METHOD	140# HAMMER 30" DROP, MODIFIED CALIFORNIA SAMPLER					
LOGGER	CHRIS NIELSON-CERQUONE					
N/S	2621.8	E/W	3168.4	ELEV.	14.58	
BORING DIAMETER:	6 INCHES	WELL CASING DIAMETER:	2 INCHES			

DIST. FROM SURF.	WELL CONST. CASING	WELL CONST. ANNULUS	LEGEND	TLV READING	SAMPLE NO.	RECOVERY	BLOWS PER 6 IN.	USCS	LOG OF MATERIAL
									PORTLAND CEMENT CONCRETE
								GP	
1		4% BENTONITE CEMENT SLURRY						ML	SANDY GRAVEL- MOIST, MEDIUM DENSE.
									SANDY SILT- DARK BROWN TO BLACK, MOIST, MEDIUM STIFF, SEWAGE ODOR
2									(FILL).
	BLANK								
3									ENCOUNTERING (RED BRICK).
		3/8" BENT. PELL							
4									SILTY SAND- GRAY/GREEN BROWN, MOIST, MEDIUM DENSE.
5									
6									
7								SM	COLOR CHANGE TO BROWN, GRADES VERY MOIST TO WET.
8									
9	0.030 INCH SLOT	3# SAND							
10									
11									
12									COLOR CHANGE TO YELLOW BROWN, GRADES WET.
13									
14									
15									TEST BORING TERMINATED @ 15' ON 4-28-89

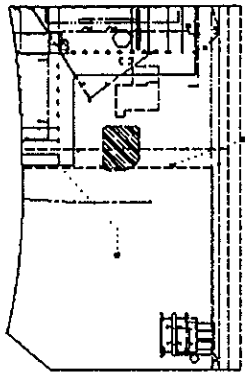


ANANIA GEOLOGIC ENGINEERING — BORING LOG

SITE/LOCATION	CARNATION/OAKLAND				BORING NO.	PR-52
PROJECT NO.	004-88-059				SHEET	1 of 1
WATER LEVEL					DRILLER	
TIME					START	FINISH
DATE					TIME	TIME 15:30
CASING DEPTH					DATE	DATE 4-27-89
DRILLING CONTRACTOR						
DRILLER	MIKE MOORE					
DRILLING METHOD	HOLLOW STEM AUGER					
SAMPLING METHOD	140# HAMMER 30" DROP, MODIFIED CALIFORNIA SAMPLER					
LOGGER	CHRIS NIELSON-CERQUONE					
N/S	2621.5	E/W	3168.2	ELEV.	14.55	
BORING DIAMETER:	6 INCHES	WELL CASING DIAMETER:	2 INCHES			

DIST. FROM SURF.	WELL CONST. CASING	WELL CONST. ANNULUS	LEGEND	TLV READING	SAMPLE NO.	RECOVERY	BLOWS PER 6 IN.	USCS	LOG OF MATERIAL
									PORTLAND CEMENT CONCRETE
								GP	SANDY GRAVEL- GRAY, MOIST, MEDIUM DENSE
1		4% BENTONITE CEMENT SLURRY						ML	SANDY SILT- BLACK, DRY, MEDIUM STIFF.
2	BLANK								
3		3/8" BENT. PELL							SILTY SAND- GRAY/GREEN BROWN, DRY TO MOIST, MEDIUM DENSE.
4									
5				10					
6									
7								SM	GRADES MOIST TO WET.
8									
9	0.030 INCH SLOT	3# SAND							
10									
11									
12									
13									
14									
15									TEST BORING TERMINATED @ 15' ON 4-27-89

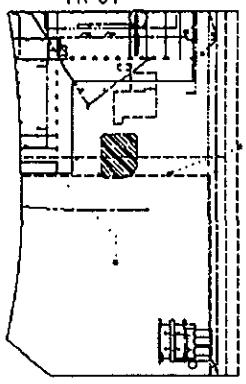
PR-53



ANANIA GEOLOGIC ENGINEERING — BORING LOG

SITE/LOCATION	CARNATION/OAKLAND
PROJECT NO.	004-88-059
BORING NO.	PR-53
SHEET	1 of 1
WATER LEVEL	
TIME	
DATE	
CASING DEPTH	
DRILLING CONTRACTOR	
DRILLER	MIKE MOORE
DRILLING METHOD	HOLLOW STEM AUGER
DRILLER START TIME	10:00
DRILLER FINISH TIME	
DATE START	4-28-89
DATE FINISH	4-28-89
SAMPLING METHOD	140# HAMMER 30" DROP, MODIFIED CALIFORNIA SAMPLER
LOGGER	CHRIS NIELSON-CERQUONE
N/S	2617.2
E/W	3187.9
ELEV.	14.43
BORING DIAMETER:	6 INCHES
WELL CASING DIAMETER:	2 INCHES

DIST. FROM SURF.	WELL CONST. CASING	WELL CONST. ANNULUS	LEGEND	TLV READING	SAMPLE NO.	RECOVERY	BLOWS PER 6 IN.	USCS	LOG OF MATERIAL
									PORTLAND CEMENT CONCRETE
								GP	
1		4% BENTONITE CEMENT SLURRY							SANDY GRAVEL- MOIST, MEDIUM DENSE
								SM	
2	BLANK								SILTY SAND- DARK BROWN TO BLACK, MOIST, MEDIUM DENSE, FINE GRAINED, SEWAGE ODOR.
3		3/8" BENT. PELL							COLOR CHANGE TO GRAY/GREEN BROWN.
4									
5									
6									
7									
8									
9	0.030 INCH SLOT	3# SAND							
10									
11									
12									COLOR CHANGE TO YELLOW BROWN, GRADES WET.
13									
14									
15									TEST BORING TERMINATED @ 15' ON 4-28-89

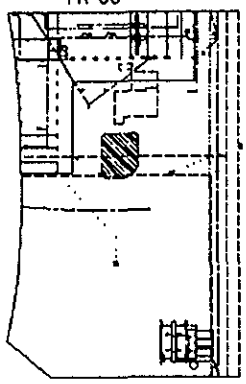


ANANIA GEOLOGIC ENGINEERING — BORING LOG

SITE/LOCATION	CARNATION/OAKLAND
PROJECT NO.	004-88-059
BORING NO.	PR-54
SHEET	1 of 1
WATER LEVEL	
TIME	
DATE	
CASING DEPTH	
DRILLER START / FINISH	
TIME	
DRILLING CONTRACTOR	
DRILLER	MIKE MOORE
DRILLING METHOD	HOLLOW STEM AUGER
DATE	4-28-89
SAMPLING METHOD	140# HAMMER 30" DROP, MODIFIED CALIFORNIA SAMPLER.
LOGGER	CHRIS NIELSON-CERQUONE
N/S	2642.4
E/W	3119.6
ELEV.	14.33
BORING DIAMETER:	6 INCHES
WELL CASING DIAMETER:	2 INCHES

DIST. FROM SURF.	WELL CONST. CASING	WELL CONST. ANNULUS	LEGEND	TLV READING	SAMPLE NO.	RECOVERY	BLOWS PER 6 IN.	USCS	LOG OF MATERIAL
									PORTLAND CEMENT CONCRETE
								GP	SANDY GRAVEL- MOIST, MEDIUM DENSE
1		4x BENTONITE CEMENT SLURRY						SM	SILTY SAND- DARK BROWN TO BLACK, MOIST, MED DENSE, HYDROCARBON
2	BLANK								ODOR.
3		3/8" BENT. PELL							COLOR CHANGE TO GRAY/GREEN, SLIGHTLY PLASTIC, STRONG
4									HYDROCARBON ODOR, NO CLASTICS.
5									
6									
7									COLOR CHANGE TO YELLOW BROWN, MOIST TO WET.
8									
9	0.030 INCH SLOT	3/4 SAND							
10									
11									
12									
13									
14									
15				10,000					TEST BORING TERMINATED @ 15' ON 4-28-89

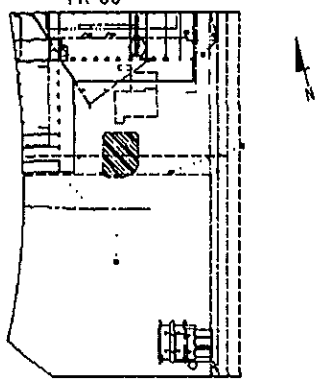
PR-55



ANANIA GEOLOGIC ENGINEERING — BORING LOG

SITE/LOCATION	CARNATION/OAKLAND				BORING NO. PR-55
PROJECT NO.	004-88-059				SHEET 1 of 1
WATER LEVEL					DRILLER
TIME					START: TIME 12:10 / FINISH: TIME
DATE					START: DATE 4-28-89 / FINISH: DATE 4-28-89
CASING DEPTH					
DRILLING CONTRACTOR					
DRILLER	MIKE MOORE				
DRILLING METHOD	HOLLOW STEM AUGER				
SAMPLING METHOD	140# HAMMER 30" DROP, MODIFIED CALIFORNIA SAMPLER				
LOGGER	CHRIS NIELSON-CERQUONE				
N/S	2625.1	E/W	3214.7	ELEV.	14.48
BORING DIAMETER:	6 INCHES	WELL CASING DIAMETER:	2 INCHES		

DIST. FROM SURF.	WELL CONST. CASING	WELL CONST. ANNULUS	LEGEND	TLV READING	SAMPLE NO.	RECOVERY	BLOWS PER 6 IN.	USCS	LOG OF MATERIAL
									PORTLAND CEMENT CONCRETE
								GP	SANDY GRAVEL- MOIST, MEDIUM DENSE
1		BENTONITE CEMENT SLURRY						SM	SILTY SAND- BROWN, MOIST, MEDIUM DENSE, STRONG HYDROCARBON ODOR.
2		4%							
3	BLANK								COLOR CHANGE TO GRAY/GREEN, MOIST, HYDROCARBON ODOR.
4		3/8" BENT. PELL							
5									
6									
7									
8									COLOR CHANGE TO YELLOW BROWN, GRADES MOIST TO WET.
9	0.030 INCH SLOT	3# SAND							
10									
11									
12									
13									
14									
15				3500					TEST BORING TERMINATED @ 15' ON 4-28-89



ANANIA GEOLOGIC ENGINEERING — BORING LOG

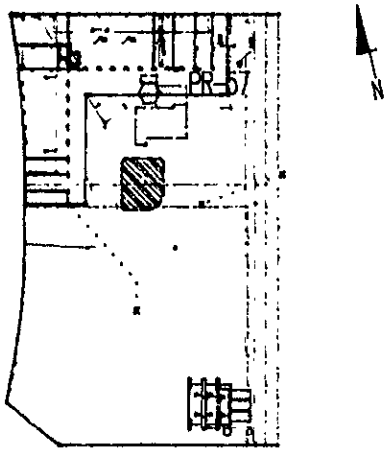
SITE/LOCATION	CARNATION/OAKLAND
PROJECT NO.	004-88-059
BORING NO.	PR-56
SHEET	1 of 1
WATER LEVEL	
TIME	
DATE	
CASING DEPTH	
DRILLER	
START	FINISH
TIME	TIME 12:45
DRILLING CONTRACTOR	
DRILLER	MIKE MOORE
DRILLING METHOD	HOLLOW STEM AUGER
DATE	4-28-89
DATE	4-28-89
SAMPLING METHOD	140# HAMMER 30" DROP, MODIFIED CALIFORNIA SAMPLER
LOGGER	CHRIS NIELSON-CERQUONE
N/S	2606.9
E/W	3208.2
ELEV.	14.59
BORING DIAMETER:	6 INCHES
WELL CASING DIAMETER:	2 INCHES

DIST. FROM SURF.	WELL CONST. CASING	WELL CONST. ANNULUS	LEGEND	TLV READING	SAMPLE NO.	RECOVERY	BLOWS PER 6 IN.	USCS	LOG OF MATERIAL
									PORTLAND CEMENT CONCRETE
								GP	SANDY GRAVEL- MOIST, MEDIUM DENSE.
1		4% BENTONITE CEMENT SLURRY						SM	SILTY SAND (FINE)- DARK BROWN, MOIST, MEDIUM DENSE, FINE GRAINED.
2	BLANK								
3		3/8" BENT. PELL							COLOR CHANGE TO GRAY/GREEN BROWN, MEDIUM GRAINED, STRONG HYDROCARBON
4									ODOR.
5									
6									
7									GRADES MOIST TO WET
8									
9	0.030 INCH SLOT	3/4 SAND							GRADES WET
10									
11									
12									
13									
14									
15				2300					
									TEST BORING TERMINATED @ 15' ON 4-28-89

ANANIA GEOLOGIC ENGINEERING

BORING LOG

LOCATION OF BORING



SITE/LOCATION	CARNATION/OAKLAND				BORING NO. PR-57
PROJECT NO.	004-88-059				SHEET 1 OF 1
WATER LEVEL					DRILLER
TIME					START TIME: 10:30 / FINISH TIME: 11:20
DATE					DATE: 5-11-89 / DATE: 5-11-89
CASING DEPTH					

DRILLING CONTRACTOR

DRILLER MIKE MOORE

DRILLING METHOD HOLLOW STEM AUGER

SAMPLING METHOD 140# HAMMER 30" DROP, MODIFIED CALIFORNIA SAMPLER.

LOGGER JOHN RUSSELL

N/S 2572.7 E/W 3181.1 ELEV. 14.31

BORING DIAMETER: 6 INCHES WELL CASING DIAMETER: 2 INCHES

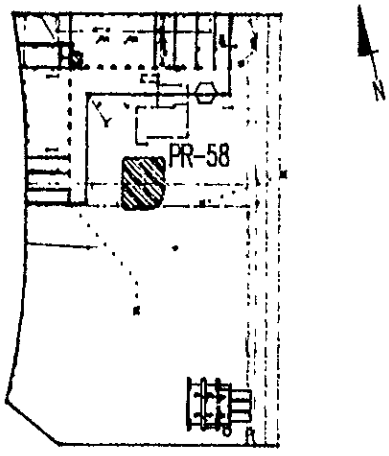
REVIEWED BY: M.A.M. DATE 8-29-89

DIST. FROM SURF.	WELL CONST. CASING	WELL CONST. ANNULUS	LEGEND	TLV READING	SAMPLE NO.	RECOVERY	BLOWS PER 6 IN.	USCS	LOG OF MATERIAL
									PORTLAND CEMENT CONCRETE
1		4" BENTONITE CEMENT SLURRY						SP	
2									
3	BLANK	3/8" BENT-PELL							
4									
5									SAND- BROWN, MOIST, MEDIUM DENSE, FINE GRAINED WITH QUARTZ, MAFICS
6									AND TRACE CLAY, SLIGHT HYDROCARBON ODOR.
7									
8									
9									
10	0.030 INCH SLOT	3/4" SAND		10					SILTY SAND- BROWN, MOIST, MEDIUM DENSE, FINE GRAINED WITH QUARTZ,
11								SM	MAFICS AND TRACE CLAY, SLIGHT HYDROCARBON ODOR.
12									
13									
14									
15				120					SLIGHT HYDROCARBON ODOR.
									TEST BORING TERMINATED @ 15' ON 5-11-89
									MATERIALS: 2 BAGS OF SAND
									1/2 5 GALLON BUCKET OF BENTONITE

ANANIA GEOLOGIC ENGINEERING

BORING LOG

LOCATION OF BORING



SITE/LOCATION	CARNATION/OAKLAND				BORING NO. PR-58
PROJECT NO.	004-88-059				SHEET 1 OF 1
WATER LEVEL					DRILLER
TIME					START: TIME 9:00, DATE 5-12-89
DATE					FINISH: TIME 9:30, DATE 5-12-89
CASING DEPTH					

DRILLING CONTRACTOR

DRILLER MIKE MOORE

DRILLING METHOD HOLLOW STEM AUGER

SAMPLING METHOD 140# HAMMER 30" DROP, MODIFIED CALIFORNIA SAMPLER.

LOGGER JOHN RUSSELL

N/S 2555.6 E/W 3237.4 ELEV. 14.28

BORING DIAMETER: 6 INCHES WELL CASING DIAMETER: 2 INCHES

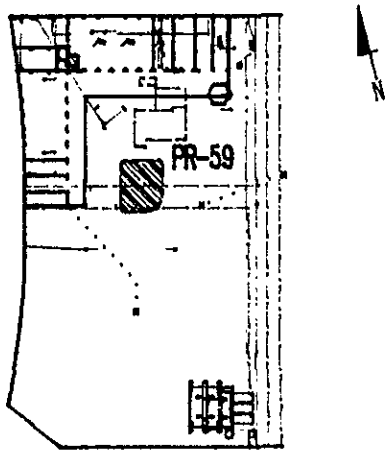
REVIEWED BY: M.A.M. DATE 6-29-89

DIST. FROM SURF.	WELL CONST. CASING	WELL CONST. ANNULUS	LEGEND	TLV READING	SAMPLE NO.	RECOVERY	BLOWS PER 6 IN.	USCS	LOG OF MATERIAL
									PORTLAND CEMENT CONCRETE
1		4¢ BENTONITE CEMENT SLURRY						SM	
2	BLANK								
3		3/8" BENT. PELL.							
4				24					SILTY SAND- BROWN, MOIST, MEDIUM DENSE, FINE GRAINED WITH QUARTZ, MAFICS,
5									HYDROCARBON ODOR.
6									
7									
8									
9	0.030 INCH SLOT	¾ SAND							
10				144					COLOR CHANGE TO LIGHT BROWN WITH TRACE CLAY, FINE GRAINED, HYDROCARBON
11									ODOR.
12									
13									
14									
15				1200					HYDROCARBON ODOR.
									TEST BORING TERMINATED @ 15' ON 5-12-89
									MATERIALS: 2 BAGS OF SAND
									1/2 5 GALLON BUCKET OF BENTONITE

ANANIA GEOLOGIC ENGINEERING

BORING LOG

LOCATION OF BORING



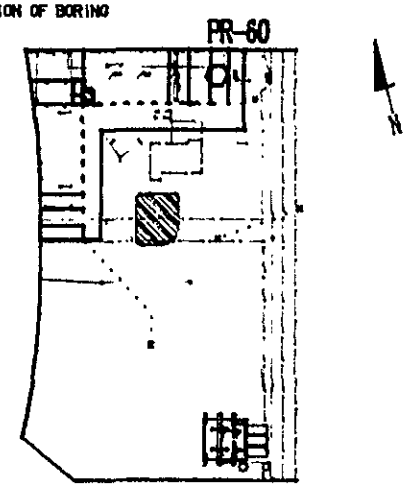
SITE/LOCATION	CARNATION/OAKLAND				BORING NO. PR-59
PROJECT NO.	004-88-059				
WATER LEVEL					SHEET 1 OF 1
TIME					DRILLER
DATE					START / FINISH
CASING DEPTH					TIME 9:45 / TIME 10:15
DRILLING CONTRACTOR					DATE 5-12-89 / DATE 5-12-89
DRILLER	MIKE MOORE				
DRILLING METHOD	HOLLOW STEM AUGER				
SAMPLING METHOD	140# HAMMER 30" DROP, MODIFIED CALIFORNIA SAMPLER.				
LOGGER	JOHN RUSSELL				
N/S	2550.7	E/W	3254.2	ELEV.	14.15
BORING DIAMETER:	6 INCHES	WELL CASING DIAMETER:	2 INCHES		
REVIEWED BY:	M.A.M.	DATE	5-29-89		

DIST. FROM SURF.	WELL CONST. CASING	WELL CONST. ANNULUS	LEGEND	TLV READING	SAMPLE NO.	RECOVERY	BLOWS PER 6 IN.	USCS	LOG OF MATERIAL
									PORTLAND CEMENT CONCRETE
1									SILTY SAND- BROWN, MOIST, MEDIUM DENSE, FINE GRAINED, QUARTZ,
2	BLANK	4" BENTONITE CEMENT SLURRY							MAFICS, HYDROCARBON ODOR.
3		3/8" BENT. PELL						SM	
4				95					
5									
6									
7									
8									
9	0.020 INCH SLOT	#3 SAND							
10				130					COLOR CHANGE TO RED BROWN, FINE-GRAINED, HYDROCARBON ODOR.
11									
12									
13									
14									
15				10000+					GRADES WITH TRACE CLAY, HYDROCARBON ODOR.
									TEST BORING TERMINATED @ 15' ON 5-11-89
									MATERIALS: 2 BAGS OF SAND
									1/2 5 GALLON BUCKET OF BENTONITE

ANANIA GEOLOGIC ENGINEERING

BORING LOG

LOCATION OF BORING



SITE/LOCATION	CARNATION/OAKLAND				BORING NO. PR-60
PROJECT NO.	004-88-069				SHEET 1 OF 1
WATER LEVEL					DRILLER
TIME					START TIME 13:30 / FINISH TIME 14:00
DATE					DATE 5-16-89 / DATE 5-16-89
CASING DEPTH					

DRILLING CONTRACTOR

DRILLER MIKE MOORE

DRILLING METHOD HOLLOW STEM AUGER

SAMPLING METHOD 140# HAMMER 30" DROP, MODIFIED CALIFORNIA SAMPLER.

LOGGER JOHN RUSSELL

N/S 2811.4 | E/W 3253.1 | ELEV. 14.67

BORING DIAMETER: 8 INCHES | WELL CASING DIAMETER: 2 INCHES

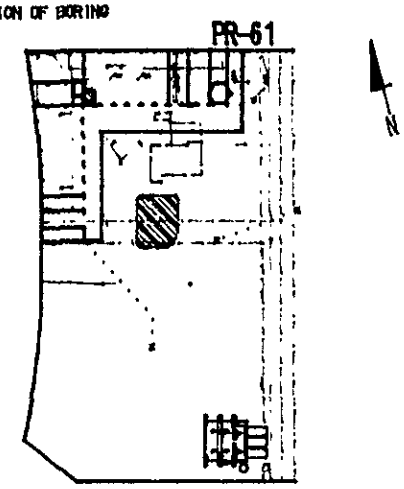
REVIEWED BY: M.A.M. DATE 5-29-89

DIST. FROM SURF.	WELL CONST. CASING	WELL CONST. ANNULUS	LEGEND	TLV READING	SAMPLE NO.	RECOVERY	BLOWS PER 6 IN.	USCS	LOG OF MATERIAL
									PORTLAND CEMENT CONCRETE
1		4# BENTONITE CEMENT SLURRY							
2									SAND- GRAY, DRY TO MOIST, FINE-GRAINED, MEDIUM DENSE WITH MICA, QUARTZ, MAFICS, HYDROCARBON ODOR.
3	BLANK							SP	
4		3/8" BENT. PELL.							
5									
6									
7									
8									
9	0.030 INCH SLOT	3# SAND							
10				130					SILTY SAND- LIGHT BROWN, MOIST, MEDIUM DENSE, FINE-GRAINED WITH MICA, QUARTZ, MAFICS.
11									
12								SM	
13									
14									
15				120					
									TEST BORING TERMINATED @ 15' ON 5-16-89
									MATERIALS: 2 BAGS OF SAND
									1/2 5 GALLON BUCKET OF BENTONITE

ANANIA GEOLOGIC ENGINEERING

BORING LOG

LOCATION OF BORING



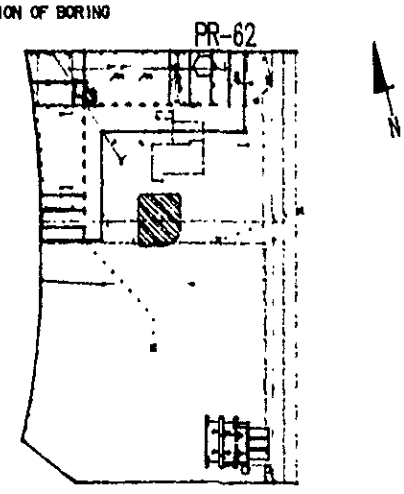
SITE/LOCATION	CARNATION/OAKLAND				BORING NO. PR-61
PROJECT NO.	004-88-059				SHEET 1 OF 1
WATER LEVEL					DRILLER
TIME					START TIME 14:10 / FINISH TIME 14:45
DATE					START DATE 5-16-89 / FINISH DATE 5-16-89
CASING DEPTH					
DRILLING CONTRACTOR					
DRILLER	MIKE MOORE				
DRILLING METHOD	HOLLOW STEM AUGER				
SAMPLING METHOD	140# HAMMER 30" DROP, MODIFIED CALIFORNIA SAMPLER.				
LOGGER	JOHN RUSSELL				
N/S	2596.3	E/W	3249.1	ELEV.	14.56
BORING DIAMETER:	8 INCHES	WELL CASING DIAMETER:	2 INCHES		
REVIEWED BY:	M.A.M.	DATE	8-29-89		

DIST. FROM SURF.	WELL CONST. CASING	WELL CONST. ANNULUS	LEGEND	TLV READING	SAMPLE NO.	RECOVERY	BLOWS PER 6 IN.	USCS	LOG OF MATERIAL
									PORTLAND CEMENT CONCRETE
1		4¢ BENTONITE CEMENT SLURRY						SP	SAND- BROWN, DRY TO MOIST, MEDIUM DENSE, FINE GRAINED WITH MICA.
2	BLANK								QUARTZ, MAFICS, HYDROCARBON ODOR.
3		3/8" BENT. PELL.							
4									
5									
6									
7									
8									
9	0.020 INCH SLOT	2¢ SAND							
10									SAND- BROWN, DRY TO MOIST, MEDIUM DENSE, FINE GRAINED WITH MICA.
11									QUARTZ, MAFICS, HYDROCARBON ODOR.
12								SM	
13									
14									SILTY SAND- FINE-GRAINED, BROWN, MOIST, SEMI-PLASTIC, MICA, QUARTZ,
15									MAFICS, HYDROCARBON ODOR.
									TEST BORING TERMINATED @ 15' ON 5-16-89
									MATERIALS: 2 BAGS OF SAND
									1/2 5 GALLON BUCKET OF BENTONITE

ANANIA GEOLOGIC ENGINEERING

BORING LOG

LOCATION OF BORING



SITE/LOCATION	CARNATION/OAKLAND				BORING NO. PR-62
PROJECT NO.	004-88-059				SHEET 1 OF 1
WATER LEVEL					DRILLER
TIME					START: TIME 10:10 / FINISH: TIME 10:40
DATE					START: DATE 5-17-89 / FINISH: DATE 5-17-89
CASING DEPTH					

DRILLING CONTRACTOR

DRILLER MIKE MOORE

DRILLING METHOD HOLLOW STEM AUGER

SAMPLING METHOD 140# HAMMER 30" DROP, MODIFIED CALIFORNIA SAMPLER.

LOGGER JOHN RUSSELL

N/S 2829.0 E/W 3240.9 ELEV. 14.53

BORING DIAMETER: 6 INCHES WELL CASING DIAMETER: 2 INCHES

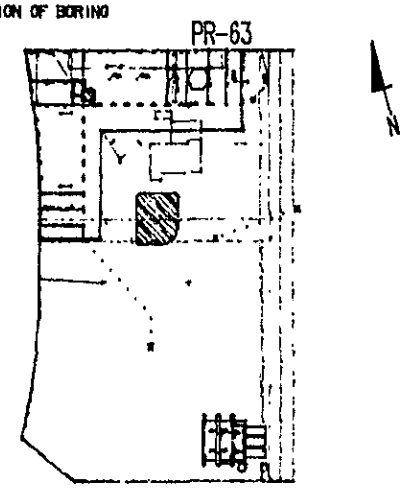
REVIEWED BY: M.A.M. DATE 8-29-89

DIST. FROM SURF.	WELL CONST. CASING	WELL CONST. ANNULUS	LEGEND	TLV READING	SAMPLE NO.	RECOVERY	BLOWS PER 6 IN.	USCS	LOG OF MATERIAL
									PORTLAND CEMENT CONCRETE
1		4± BENTONITE CEMENT SLURRY							SAND- DARK GRAY, DRY TO MOIST, MEDIUM DENSE, FINE GRAINED WITH QUARTZ, MAFICS, HYDROCARBON ODOR.
2	BLANK								
3		3/8" BENT. PELL.						SP	
4									
5				126					
6									
7									
8									
9									
10	0.030 INCH SLOT	3# SAND		1100					SILTY SAND- BROWN, MOIST, MEDIUM DENSE, FINE GRAINED WITH QUARTZ, HYDROCARBON ODOR.
11									
12								SM	
13									
14									
15				2000					HYDROCARBON ODOR.
									TEST BORING TERMINATED @ 15' ON 5-17-89
									MATERIALS: 2 BAGS OF SAND
									1/2 5 GALLON BUCKET OF BENTONITE

ANANIA GEOLOGIC ENGINEERING

BORING LOG

LOCATION OF BORING



SITE/LOCATION	CARNATION/OAKLAND				BORING NO. PR-63
PROJECT NO.	004-88-059				SHEET 1 OF 1
WATER LEVEL					DRILLER
TIME					START TIME 11:00 / FINISH TIME 11:40
DATE					START DATE 5-17-89 / FINISH DATE 5-17-89
CASING DEPTH					

DRILLING CONTRACTOR

DRILLER MIKE MOORE

DRILLING METHOD HOLLOW STEM AUGER

SAMPLING METHOD 140# HAMMER 30" DROP, MODIFIED CALIFORNIA SAMPLER,

LOGGER JOHN RUSSELL

N/S 2612.5 E/W 3238.3 ELEV. 14.39

BORING DIAMETER: 6 INCHES WELL CASING DIAMETER: 2 INCHES

REVIEWED BY: M.A.M. DATE 8-29-89

DIST. FROM SURF.	WELL CONST. CASING	WELL CONST. ANNULUS	LEGEND	TLV READING	SAMPLE NO.	RECOVERY	BLOWS PER 6 IN.	USCS	LOG OF MATERIAL
									PORTLAND CEMENT CONCRETE
1		4% BENTONITE CEMENT SLURRY							SAND- BROWN, MOIST TO WET, FINE-GRAINED WITH QUARTZ, MAFICS,
2									HYDROCARBON ODOR.
3	BLANK							SP	
4		3/8" BENT. PELL.							
5				95					
6									
7									
8									
9	0.030 INCH SLOT	3/4 SAND							
10				6000					SILTY SAND- BROWN, DRY TO MOIST, MEDIUM DENSE, FINE-GRAINED WITH QUARTZ,
11									MAFICS, HYDROCARBON ODOR.
12								SM	
13									
14									
15				2800					GRADES WET, HYDROCARBON ODOR.
									TEST BORING TERMINATED @ 15' ON 5-17-89

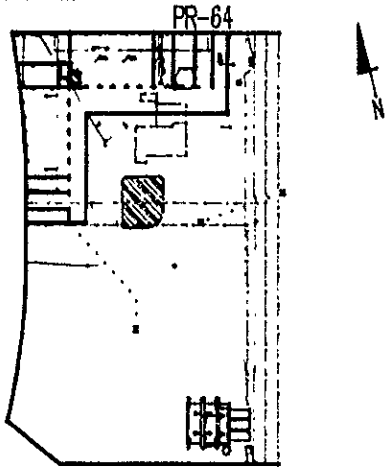
MATERIALS: 2 BAGS OF SAND

1 1/2 5 GALLON BUCKET OF BENTONITE

ANANIA GEOLOGIC ENGINEERING

BORING LOG

LOCATION OF BORING



SITE/LOCATION	CARNATION/OAKLAND				BORING NO. PR-64
PROJECT NO.	004-88-059				SHEET 1 OF 1
WATER LEVEL					DRILLER
TIME					START: TIME 11:45 / DATE 5-17-89
DATE					FINISH: TIME 12:10 / DATE 5-17-89
CASING DEPTH					

DRILLING CONTRACTOR

DRILLER MIKE MOORE

DRILLING METHOD HOLLOW STEM AUGER

SAMPLING METHOD 140# HAMMER 30" DROP, MODIFIED CALIFORNIA SAMPLER.

LOGGER JOHN RUSSELL

N/S 2594.5 E/W 3230.2 ELEV. 14.55

BORING DIAMETER: 8 INCHES WELL CASING DIAMETER: 2 INCHES

REVIEWED BY: M.A.M. DATE 8-29-89

DIST. FROM SURF.	WELL CONST. CASING	WELL CONST. ANNULUS	LEGEND	TLV READING	SAMPLE NO.	RECOVERY	BLOWS PER 6 IN.	USCS	LOG OF MATERIAL
									PORTLAND CEMENT CONCRETE
1		4" BENTONITE CEMENT SLURRY							SAND- BROWN, MOIST, MEDIUM DENSE, FINE GRAINED WITH QUARTZ,
2	BLANK								HYDROCARBON ODOR.
3		3/8" BENT-PELL						SP	
4									
5				88					
6									
7									
8									
9	0.020 INCH SLOT	3# SAND							
10				10000					SILTY SAND- BROWN, MOIST, MEDIUM DENSE, FINE GRAINED WITH QUARTZ,
11									MAFICS, HYDROCARBON ODOR.
12								SM	
13									
14									
15				10000					HYDROCARBON ODOR.
									TEST BORING TERMINATED @ 15' ON 5-17-89

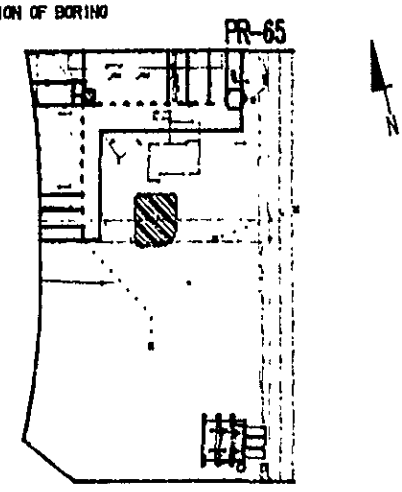
MATERIALS: 2 BAGS OF SAND

1/2 5 GALLON BUCKET OF BENTONITE

ANANIA GEOLOGIC ENGINEERING

BORING LOG

LOCATION OF BORING



SITE/LOCATION	CARNATION/OAKLAND				BORING NO. PR-65
PROJECT NO.	004-68-059				SHEET 1 OF 1
WATER LEVEL					DRILLER
TIME					START TIME 13:15 / FINISH TIME 13:45
DATE					DATE 5-17-89 / DATE 5-17-89
CASING DEPTH					

DRILLING CONTRACTOR

DRILLER MIKE MOORE

DRILLING METHOD HOLLOW STEM AUGER

SAMPLING METHOD 140# HAMMER 30" DROP, MODIFIED CALIFORNIA SAMPLER.

LOGGER JOHN RUSSELL

N/S 2583.6 E/W 3283.8 ELEV. 14.50

BORING DIAMETER: 6 INCHES WELL CASING DIAMETER: 2 INCHES

REVIEWED BY: M.A.M. DATE 8-29-89

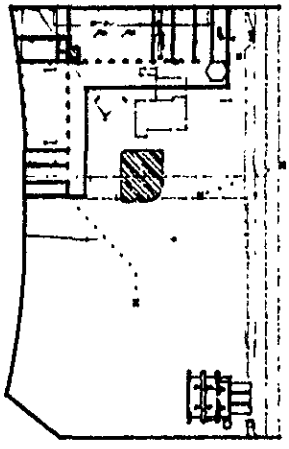
DIST. FROM SURF.	WELL CONST. CASING	WELL CONST. ANNULUS	LEGEND	TLV READING	SAMPLE NO.	RECOVERY	BLOWS PER 6 IN.	USCS	LOG OF MATERIAL
									PORTLAND CEMENT CONCRETE
1		4± BENTONITE CEMENT SLURRY							SAND- BROWN, DRY TO MOIST, MEDIUM DENSE, FINE-GRAINED WITH QUARTZ,
2									MAFICS, NO HYDROCARBON ODOR.
3	BLANK							SP	
4		3/8" BENT. PELL							
5				64					
6									
7									
8									
9									
10	0.020 INCH SLOT	3/4 SAND		7000					SILTY SAND- MOIST, MEDIUM DENSE, FINE GRAINED WITH QUARTZ, MAFICS,
									HYDROCARBON ODOR, SOME CLAY.
11									
12								SM	
13									
14									
15				10000					HYDROCARBON ODOR.
									TEST BORING TERMINATED @ 15' ON 5-17-89
									MATERIALS: 2 BAGS OF SAND
									1/2 5 GALLON BUCKET OF BENTONITE

ANANIA GEOLOGIC ENGINEERING

BORING LOG

LOCATION OF BORING

PR-66



SITE/LOCATION	CARNATION/OAKLAND				BORING NO. PR-66
PROJECT NO.	004-88-059				SHEET 1 OF 1
WATER LEVEL					DRILLER
TIME					START TIME 13:50 / FINISH TIME 14:30
DATE					START DATE 5-17-89 / FINISH DATE 5-17-89
CASING DEPTH					

DRILLING CONTRACTOR

DRILLER MIKE MOORE

DRILLING METHOD HOLLOW STEM AUGER

SAMPLING METHOD 140# HAMMER 30" DROP, MODIFIED CALIFORNIA SAMPLER.

LOGGER JOHN RUSSELL

N/S 2564.1 E/W 3258.3 ELEV. 14.26

BORING DIAMETER: 8 INCHES WELL CASING DIAMETER: 2 INCHES

REVIEWED BY: M.A.M. DATE 8-29-89

DIST. FROM SURF.	WELL CONST. CASING	WELL CONST. ANNULUS	LEGEND	TLV READING	SAMPLE NO.	RECOVERY	BLOWS PER 6 IN.	USCS	LOG OF MATERIAL
									PORTLAND CEMENT CONCRETE
1		4# BENTONITE CEMENT SLURRY							SAND- BROWN, DRY TO MOIST, MEDIUM DENSE, FINE GRAINED WITH QUARTZ,
2	BLANK								MAFICS, NO HYDROCARBON ODOR.
3		3/8" BENT. PELL						SP	
4									
5				70					
6									
7									
8									
9	0.020 INCH SLOT	#3 SAND							
10				3200					SILTY SAND- BROWN, DRY TO MOIST, MEDIUM DENSE, FINE GRAINED WITH QUARTZ,
11									MAFICS, HYDROCARBON ODOR.
12								SM	
13									
14									
15				6000					HYDROCARBON ODOR.
									TEST BORING TERMINATED @ 15' ON 5-17-89

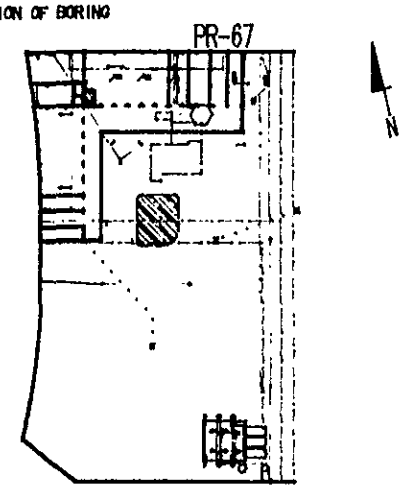
MATERIALS: 2 BAGS OF SAND

1/2 5 GALLON BUCKET OF BENTONITE

ANANIA GEOLOGIC ENGINEERING

BORING LOG

LOCATION OF BORING



SITE/LOCATION	CARNATION/OAKLAND				BORING NO. PR-67
PROJECT NO.	004-88-059				SHEET 1 OF 1
WATER LEVEL					DRILLER
TIME					START TIME 10:00 / FINISH TIME 10:50
DATE					START DATE 5-18-89 / FINISH DATE 5-18-89
CASING DEPTH					

DRILLING CONTRACTOR

DRILLER MIKE MOORE

DRILLING METHOD HOLLOW STEM AUGER

SAMPLING METHOD 140# HAMMER 30" DROP, MODIFIED CALIFORNIA SAMPLER.

LOGGER JOHN RUSSELL

N/S 2575.5 E/W 3224.8 ELEV. 14.12

BORING DIAMETER: 6 INCHES WELL CASING DIAMETER: 2 INCHES

REVIEWED BY: M.A.M. DATE 6-29-89

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							SAND- GRAY, MOIST, MEDIUM DENSE, FINE GRAINED WITH QUARTZ, MAFICS,
2	BLANK								HYDROCARBON ODOR.
3								SP	
		3/8" BENT. PELL.							
4									
				2600					
5									
6									
7									
8									
9	0.030 INCH SLOT								
		3/4 SAND		10000					SILTY SAND- BROWN, MOIST, MEDIUM DENSE, FINE GRAINED WITH QUARTZ, MAFICS,
10									HYDROCARBON ODOR.
11									
12								SM	
13									
14									
				9000					HYDROCARBON ODOR.
15									TEST BORING TERMINATED @ 15' ON 5-18-89

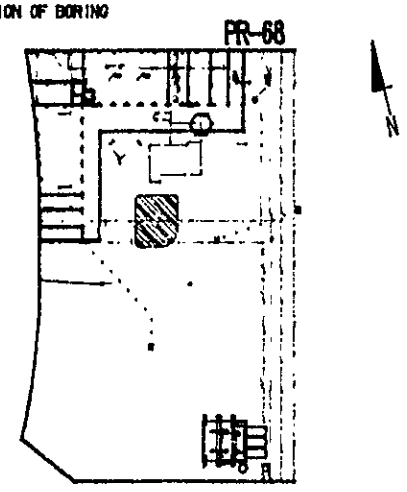
MATERIALS: 2 BAGS OF SAND

1/2 5 GALLON BUCKET OF BENTONITE

ANANIA GEOLOGIC ENGINEERING

BORING LOG

LOCATION OF BORING



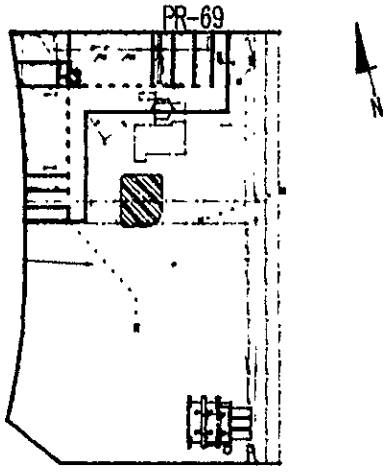
SITE/LOCATION	CARNATION/OAKLAND				BORING NO. PR-68
PROJECT NO.	004-88-059				SHEET 1 OF 1
WATER LEVEL					DRILLER
TIME					START TIME 10:55 / FINISH TIME 11:40
DATE					START DATE 5-18-89 / FINISH DATE 5-18-89
CASING DEPTH					
DRILLING CONTRACTOR					
DRILLER	MIKE MOORE				
DRILLING METHOD	HOLLOW STEM AUGER				
SAMPLING METHOD	140# HAMMER 30" DROP, MODIFIED CALIFORNIA SAMPLER.				
LOGGER	JOHN RUSSELL				
N/S	2561.5	E/W	3220.6	ELEV.	14.45
BORING DIAMETER:	8 INCHES	WELL CASING DIAMETER:	2 INCHES		
REVIEWED BY:	M.A.M.	DATE	6-29-89		

DIST. FROM SURF.	WELL CONST. CASING	WELL CONST. SLOTTED	LEGEND	TLV READING	SAMPLE NO.	RECOVERY	BLOWS PER 6 IN.	USCS	LOG OF MATERIAL
									PORTLAND CEMENT CONCRETE
1									
2									
3	BLANK	4" BENTONITE GROUT SLURRY						SP	
4		3/8" BENT. PELL.							
5				800					SAND- MOIST, MEDIUM DENSE, FINE GRAINED WITH QUARTZ, MAFICS, HYDROCARBON ODOR.
6									
7									
8									
9	0.020 INCH SLOT	36" SAND							
10				6800					SILTY SAND- BROWN WITH GRAY STAINING ON SOIL, MOIST, MEDIUM DENSE, FINE GRAINED WITH QUARTZ, MAFICS, HYDROCARBON ODOR.
11									
12								SM	
13									
14									
15				8000					HYDROCARBON ODOR.
									TEST BORING TERMINATED @ 15' ON 5-18-89
									MATERIALS: 2 BAGS OF SAND
									1/2 5 GALLON BUCKET OF BENTONITE

ANANIA GEOLOGIC ENGINEERING

BORING LOG

LOCATION OF BORING



SITE/LOCATION	CARNATION/OAKLAND				BORING NO. PR-69
PROJECT NO.	004-88-059				SHEET 1 OF 1
WATER LEVEL					DRILLER
TIME					START TIME 11:45 / FINISH TIME 12:15
DATE					DATE 5-18-89 / DATE 5-18-89
CASING DEPTH					

DRILLING CONTRACTOR

DRILLER MIKE MOORE

DRILLING METHOD HOLLOW STEM AUGER

SAMPLING METHOD 140# HAMMER 30" DROP, MODIFIED CALIFORNIA SAMPLER.

LOGGER JOHN RUSSELL

N/S 2567.8 E/W 3197.8 ELEV. 14.27

BORING DIAMETER: 6 INCHES WELL CASING DIAMETER: 2 INCHES

REVIEWED BY: M.A.M. DATE 8-29-89

DIST. FROM SURF.	WELL CONST. CASING	WELL CONST. ANNULUS	LEGEND	TLV READING	SAMPLE NO.	RECOVERY	BLOWS PER 6 IN.	USCS	LOG OF MATERIAL
									PORTLAND CEMENT CONCRETE
1		4# BENTONITE CEMENT SLURRY						SM	SILTY SAND- GRAY, MOIST, MEDIUM DENSE, FINE TO COARSE GRAINED WITH
2	BLANK								COBBLES TO 5mm, HYDROCARBON ODOR.
3		3/8" BENT. PELL.							
4									
5				180					
6									
7									
8									
9								ML	
10	0.030 INCH SLOT	#3 SAND		5000					SANDY SILT- GRAY, MOIST, MEDIUM STIFF WITH TRACE CLAY, QUARTZ, MAFICS, HYDROCARBON ODOR.
11									
12									
13									
14								SM	
15				4400					SILTY SAND- GRAY, MOIST, MEDIUM DENSE WITH TRACE CLAY, QUARTZ, HYDROCARBON ODOR.
									TEST BORING TERMINATED @ 15' ON 5-18-89

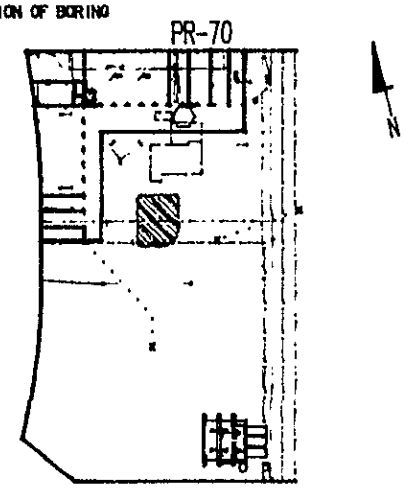
MATERIALS: 2 BAGS OF SAND

1/2 5 GALLON BUCKET OF BENTONITE

ANANIA GEOLOGIC ENGINEERING

BORING LOG

LOCATION OF BORING



SITE/LOCATION	CARNATION/OAKLAND				BORING NO. PR-70
PROJECT NO.	004-88-059				
WATER LEVEL					SHEET 1 OF 1
TIME					DRILLER
DATE					START: DATE 5-18-89, TIME 13:20
CASING DEPTH					FINISH: DATE 5-18-89, TIME 14:00

DRILLING CONTRACTOR

DRILLER MIKE MOORE

DRILLING METHOD HOLLOW STEM AUGER

SAMPLING METHOD 140# HAMMER 30" DROP, MODIFIED CALIFORNIA SAMPLER.

LOGGER JOHN RUSSELL

N/S 2582.3 E/W 3201.3 ELEV. 14.47

BORING DIAMETER: 6 INCHES WELL CASING DIAMETER: 2 INCHES

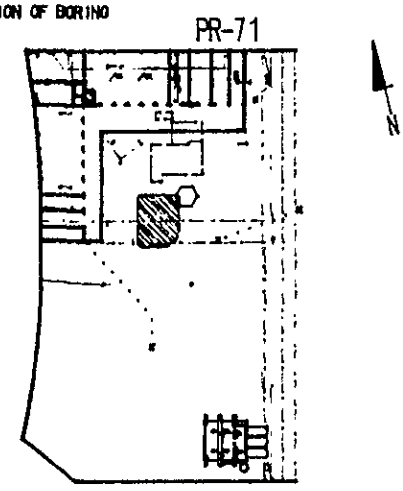
REVIEWED BY: M.A.M. DATE 8-29-89

DIST. FROM SURF.	WELL CONST. CASING	WELL CONST. ANNULUS	LEGEND	TLV READING	SAMPLE NO.	RECOVERY	BLOWS PER 6 IN.	USCS	LOG OF MATERIAL
									PORTLAND CEMENT CONCRETE
1		4" BENTONITE CEMENT SLURRY							
2									
3	BLANK							SP	
4		3/8" BENT-PELL							
5				7800					SAND- GRAY, MOIST, MEDIUM DENSE, FINE-GRAINED WITH QUARTZ, MAFICS, HYDROCARBON ODOR.
6									
7									
8									
9									
10	0.030 INCH SLOT	3/4 SAND		10000					SANDY SILT- LIGHT BROWN AND TAN STAINING, MOIST, MEDIUM DENSE WITH SOME CLAY, QUARTZ, MAFICS, HYDROCARBON ODOR.
11								ML	
12									
13									
14									
15				4000					GRADES MOIST TO WET, HYDROCARBON ODOR.
									TEST BORING TERMINATED @ 15' ON 5-18-89
									MATERIALS: 2 BAGS OF SAND
									1/2 5 GALLON BUCKET OF BENTONITE

ANANIA GEOLOGIC ENGINEERING

BORING LOG

LOCATION OF BORING



SITE/LOCATION	CARNATION/OAKLAND				BORING NO. PR-71
PROJECT NO.	004-88-059				SHEET 1 OF 1
WATER LEVEL					DRILLER
TIME					START TIME 14:45 / FINISH TIME 15:45
DATE					DATE 5-18-89 / DATE 5-18-89
CASING DEPTH					

DRILLING CONTRACTOR

DRILLER MIKE MOORE

DRILLING METHOD HOLLOW STEM AUGER

SAMPLING METHOD 140# HAMMER 30" DROP, MODIFIED CALIFORNIA SAMPLER

LOGGER JOHN RUSSELL

N/S 2498.7 E/W 3172.4 ELEV. 14.97

BORING DIAMETER: 8 INCHES WELL CASING DIAMETER: 2 INCHES

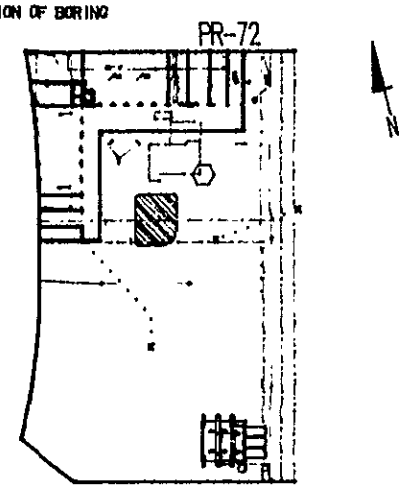
REVIEWED BY: M.A.M. DATE 8-29-89S

DIST. FROM SURF.	WELL CONST. CASING	WELL CONST. ANNULUS	LEGEND	TLV READING	SAMPLE NO.	RECOVERY	BLOWS PER 6 IN.	USCS	LOG OF MATERIAL
									ASPHALTIC CONCRETE
1		4# BENTONITE CEMENT SLURRY						SP	
2	BLANK								
3		3/8" BENT. PELL							
4						X	15		
						X	22		
5				100	4137	X	17		SAND- LIGHT BROWN, MOIST, DENSE, FINE GRAINED WITH QUARTZ, MAFICS
									HYDROCARBON ODOR.
6									
7									
8									
9	0.020 INCH SLOT	3# SAND					12		
						X	22		
10				84	4138	X	17		HYDROCARBON ODOR.
11									
12									
13									
14						X	15		
						X	12		
15				82	4139	X	17		HYDROCARBON ODOR.
									TEST BORING TERMINATED @ 15' ON 5-18-89
									MATERIALS: 2 BAGS OF SAND
									1/2 5 GALLON BUCKET OF BENTONITE

ANANIA GEOLOGIC ENGINEERING

BORING LOG

LOCATION OF BORING



SITE/LOCATION	CARNATION/OAKLAND				BORING NO. PR-72
PROJECT NO.	004-88-059				SHEET 1 OF 1
WATER LEVEL					DRILLER
TIME					START TIME: 8:35 / FINISH TIME: 9:20
DATE					DATE: 5-19-89 / DATE: 5-19-89
CASING DEPTH					

DRILLING CONTRACTOR

DRILLER MIKE MOORE

DRILLING METHOD HOLLOW STEM AUGER

SAMPLING METHOD 140# HAMMER 30" DROP, MODIFIED CALIFORNIA SAMPLER

LOGGER JOHN RUSSELL

N/S 2510.9 E/W 3204.9 ELEV. 15.13

BORING DIAMETER: 8 INCHES WELL CASING DIAMETER: 2 INCHES

REVIEWED BY: M.A.M. DATE 8-29-89S

DIST. FROM SURF.	WELL CONST. CASING	WELL CONST. ANNULUS	LEGEND	TLV READING	SAMPLE NO.	RECOVERY	BLOWS PER 6 IN.	USCS	LOG OF MATERIAL
1		4# BENTONITE CEMENT SLURRY						SP	
2	BLANK								
3		3/8" BENT. PELL.							
4						X	13		
5						X	21		
6				160	4145	X	12		SAND- LIGHT BROWN, MOIST, MEDIUM DENSE TO DENSE, FINE-GRAINED WITH QUARTZ, HYDROCARBON ODOR.
7									
8									
9									
10	0.030 INCH SLOT	3# SAND					5		
11						X	15		
12				4000	4146	X	18		HYDROCARBON ODOR.
13									
14									
15									
						X	5		
						X	4		
				1100	4147	X	6		GRADES LOOSE, HYDROCARBON ODOR.
									TEST BORING TERMINATED @ 15' ON 5-19-89

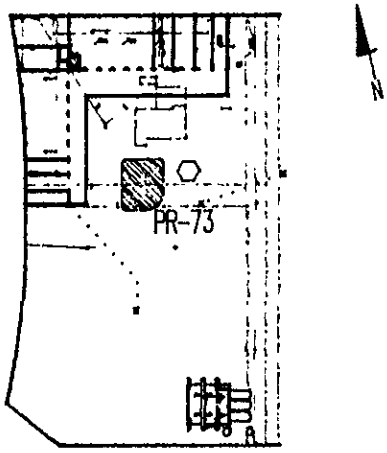
MATERIALS: 2 BAGS OF SAND

1/2 5 GALLON BUCKET OF BENTONITE

ANANIA GEOLOGIC ENGINEERING

BORING LOG

LOCATION OF BORING



SITE/LOCATION	CARNATION/OAKLAND				BORING NO. PR-73
PROJECT NO.	004-88-059				SHEET 1 OF 1
WATER LEVEL					DRILLER
TIME					START TIME 9:30 / FINISH TIME 10:10
DATE					DATE 5-19-89 / DATE 5-19-89
CASING DEPTH					

DRILLING CONTRACTOR

DRILLER MIKE MOORE

DRILLING METHOD HOLLOW STEM AUGER

SAMPLING METHOD 140# HAMMER 30" DROP, MODIFIED CALIFORNIA SAMPLER.

LOGGER JOHN RUSSELL

N/S 2477.5 E/W 3193.7 ELEV. 15.19

BORING DIAMETER: 6 INCHES WELL CASING DIAMETER: 2 INCHES

REVIEWED BY: M.A.M. DATE 8-29-89

DIST. FROM SURF.	WELL CONST. CASING	WELL CONST. ANNULUS	LEGEND	TLV READING	SAMPLE NO.	RECOVERY	BLOWS PER 6 IN.	USCS	LOG OF MATERIAL
									ASPHALTIC CONCRETE
1		4" BENTONITE CEMENT SLURRY						SP	
2									
3	BLANK								
4		3/8" BENT. PELL.				X	50		
						X	12		
5				100	4141	X	10		SAND- LIGHT BROWN, MOIST, MEDIUM DENSE, FINE GRAINED WITH QUARTZ,
6									HYDROCARBON ODOR.
7									
8									
9						X	11		
						X	7		
10	0.030 INCH SLOT	3/4" SAND		117	4142	X	12		COLOR CHANGE WITH GRAY STAINING, HYDROCARBON ODOR.
11									
12									
13									
14						X	5		
						X	7		
15				108	4143	X	11		HYDROCARBON ODOR.
									TEST BORING TERMINATED @ 15' ON 5-19-89

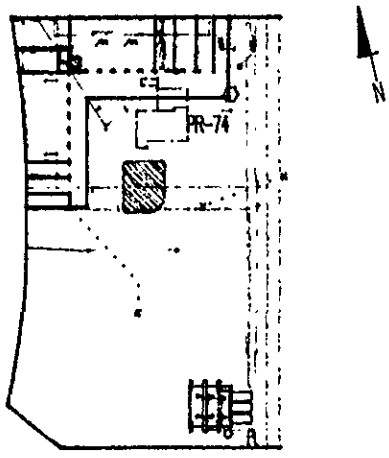
MATERIALS: 2 BAGS OF SAND

1/2 5 GALLON BUCKET OF BENTONITE

ANANIA GEOLOGIC ENGINEERING

BORING LOG

LOCATION OF BORING



SITE/LOCATION	CARNATION/OAKLAND				BORING NO. PR-74
PROJECT NO.	004-88-059				SHEET 1 OF 1
WATER LEVEL					DRILLER
TIME					START TIME 9:30 / FINISH TIME 10:10
DATE					DATE 5-25-89 / DATE 5-25-89
CASING DEPTH					

DRILLING CONTRACTOR

DRILLER MIKE MOORE

DRILLING METHOD HOLLOW STEM AUGER

SAMPLING METHOD 140# HAMMER 30" DROP, MODIFIED CALIFORNIA SAMPLER.

LOGGER JOHN RUSSELL

N/S 2477.5 E/W 3193.7 ELEV. 15.19

BORING DIAMETER: 8 INCHES WELL CASING DIAMETER: 2 INCHES

REVIEWED BY: M.A.M. DATE 8-29-89

DIST. FROM SURF.	WELL CONST. CASING	WELL CONST. ANNULUS	LEGEND	TLV READING	SAMPLE NO.	RECOVERY	BLOWS PER 6 IN.	USCS	LOG OF MATERIAL
									ASPHALTIC CONCRETE
1		4# BENTONITE CEMENT SLURRY						SP	
2	BLANK								
3		3/8" BENT. PELL							
4						X	50		
						X	12		
5				100	4141	X	10		SAND- LIGHT BROWN, MOIST, MEDIUM DENSE, FINE GRAINED WITH QUARTZ,
									HYDROCARBON ODOR.
6									
7									
8									
9	0.020 INCH SLOT					X	11		
						X	7		
10		3# SAND		117	4142	X	12		COLOR CHANGE WITH GRAY STAINING, HYDROCARBON ODOR.
11									
12									
13									
						X	5		
14						X	7		
15				108	4143	X	11		HYDROCARBON ODOR.
									TEST BORING TERMINATED @ 15' ON 5-19-89

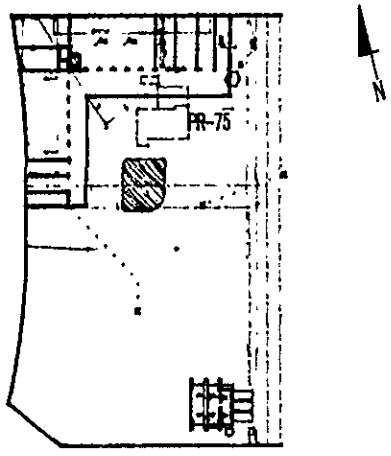
MATERIALS: 2 BAGS OF SAND

1/2 5 GALLON BUCKET OF BENTONITE

ANANIA GEOLOGIC ENGINEERING

BORING LOG

LOCATION OF BORING



SITE/LOCATION	CARNATION/OAKLAND				BORING NO. PR-75
PROJECT NO.	004-88-059				SHEET 1 OF 1
WATER LEVEL					DRILLER
TIME					START TIME 9:30 / FINISH TIME 10:10
DATE					START DATE 5-25-89 / FINISH DATE 5-25-89
CASING DEPTH					

DRILLING CONTRACTOR

DRILLER MIKE MOORE

DRILLING METHOD HOLLOW STEM AUGER

SAMPLING METHOD 140# HAMMER 30" DROP, MODIFIED CALIFORNIA SAMPLER.

LOGGER JOHN RUSSELL

N/S 2477.5 E/W 3193.7 ELEV. 15.19

BORING DIAMETER: 6 INCHES WELL CASING DIAMETER: 2 INCHES

REVIEWED BY: M.A.M. DATE 8-29-89

DIST. FROM SURF.	WELL CONST. CASING	WELL CONST. ANNULUS	LEGEND	TLV READING	SAMPLE NO.	RECOVERY	BLOWS PER 6 IN.	USCS	LOG OF MATERIAL
									ASPHALTIC CONCRETE
1		4" BENTONITE CEMENT SLURRY						SP	
2									
3	BLANK								
4		3/8" BENT. PELL.				X	50		
						X	12		
5				100	4141	X	10		SAND- LIGHT BROWN, MOIST, MEDIUM DENSE, FINE GRAINED WITH QUARTZ,
									HYDROCARBON ODOR.
6									
7									
8									
9						X	11		
						X	7		
10	0.020 INCH SLOT	3/4 SAND		177	4142	X	12		COLOR CHANGE WITH GRAY STAINING, HYDROCARBON ODOR.
11									
12									
13									
14						X	5		
						X	7		
15				108	4143	X	11		HYDROCARBON ODOR.
									TEST BORING TERMINATED @ 15' ON 5-19-89

MATERIALS: 2 BAGS OF SAND

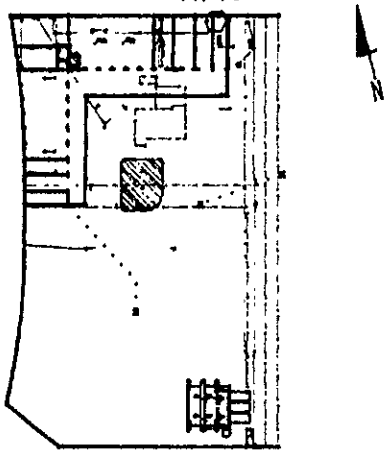
1/2 5 GALLON BUCKET OF BENTONITE

ANANIA GEOLOGIC ENGINEERING

BORING LOG

LOCATION OF BORING

PR-76



SITE/LOCATION	CARNATION/OAKLAND				BORING NO. PR-76
PROJECT NO.	004-88-059				SHEET 1 OF 1
WATER LEVEL					DRILLER
TIME					START TIME 14:30 / FINISH TIME 15:10
DATE					DATE 5-25-89 / DATE 5-25-89
CASING DEPTH					

DRILLING CONTRACTOR

DRILLER MIKE MOORE

DRILLING METHOD HOLLOW STEM AUGER

SAMPLING METHOD 140# HAMMER 30" DROP, MODIFIED CALIFORNIA SAMPLER.

LOGGER JOHN RUSSELL

N/S 2827.6 E/W 3275.7 ELEV. 14.54

BORING DIAMETER: 6 INCHES WELL CASING DIAMETER: 2 INCHES

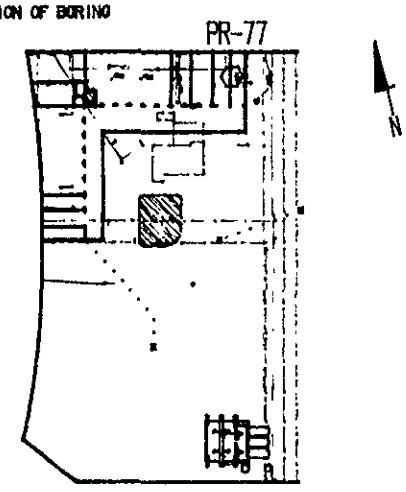
REVIEWED BY: M.A.M. DATE 6-29-89

DIST. FROM SURF.	WELL CONST. CASING	WELL CONST. ANNULUS	LEGEND	TLV READING	SAMPLE NO.	RECOVERY	BLOWS PER 6 IN.	USCS	LOG OF MATERIAL
									PORTLAND CEMENT CONCRETE
1		4# BENTONITE CEMENT SLURRY							
2									
3	BLANK							SP	
4		3/8" BENT-PELL							
5				119					SAND- DARK GRAY, MOIST, MEDIUM DENSE, FINE GRAINED WITH QUARTZ, MAFICS, HYDROCARBON ODOR.
6									
7									
8									
9	0.020 INCH SLOT	3# SAND							
10				200				SM	SILTY SAND- DARK GRAY, MOIST, MEDIUM DENSE, FINE GRAINED WITH TRACE CLAY, QUARTZ, MAFICS, HYDROCARBON ODOR.
11									
12									
13									
14									
15				150					GRADES MOIST TO WET, HYDROCARBON ODOR.
									TEST BORING TERMINATED @ 15' ON 5-25-89
									MATERIALS: 2 BAGS OF SAND
									1/2 5 GALLON BUCKET OF BENTONITE

ANANIA GEOLOGIC ENGINEERING

BORING LOG

LOCATION OF BORING



SITE/LOCATION	CARNATION/OAKLAND				BORING NO. PR-77
PROJECT NO.	004-88-059				SHEET 1 OF 1
WATER LEVEL					DRILLER
TIME					START TIME 15:30 / FINISH TIME 16:10
DATE					START DATE 5-25-89 / FINISH DATE 5-25-89
CASING DEPTH					

DRILLING CONTRACTOR

DRILLER MIKE MOORE

DRILLING METHOD HOLLOW STEM AUGER

SAMPLING METHOD 140# HAMMER 30" DROP, MODIFIED CALIFORNIA SAMPLER.

LOGGER JOHN RUSSELL

N/S 2807.1 E/W 3267.9 ELEV. 14.25

BORING DIAMETER: 6 INCHES WELL CASING DIAMETER: 2 INCHES

REVIEWED BY: M.A.M. DATE 6-29-89

DIST. FROM SURF.	WELL CONST. CASING	WELL CONST. ANNULUS	LEGEND	TLV READING	SAMPLE NO.	RECOVERY	BLOWS PER 6 IN.	USCS	LOG OF MATERIAL
									PORTLAND CEMENT CONCRETE
1		4" BENTONITE CEMENT SLURRY							
2	BLANK								
3									
4		3/8" BENT. PELL							
5				230					SAND- DARK GRAY, MOIST, MEDIUM DENSE, FINE GRAINED WITH QUARTZ, MAFICS, HYDROCARBON ODOR.
6									
7								SP	
8									
9	0.020 INCH SLOT	3/4" SAND							
10				210					SAND- FINE-GRAINED, DARK GRAY, SOME SILT, MOIST, NON-PLASTIC, QUARTZ, MAFICS, HYDROCARBON ODOR.
11									
12									
13									
14								SM	
15				500					SILTY SAND- DARK GRAY, MOIST, MEDIUM DENSE, FINE GRAINED WITH QUARTZ, MAFICS, HYDROCARBON ODOR.
									TEST BORING TERMINATED @ 15' ON 5-25-89

MATERIALS: 2 BAGS OF SAND

1/2 5 GALLON BUCKET OF BENTONITE

DATE STARTED: 7/13/89

DATE COMPLETED: 7/13/89

DRILLING EQUIPMENT: **Hollow Stem Auger**

DRILLING CONTRACTOR: **Accubore**

LOGGED BY: **Jim Wallace**

TOTAL DEPTH: **15.5**

BORING DIAMETER: **6"**

SURFACE CONDITIONS: **Asphalt Pavement**

SURFACE ELEVATION: **14.76**

COORDINATES: **N 2,512.4 E 3,151.0**

GROUNDWATER CONDITIONS:

CASING DEPTH: **15.5 feet**

FILTER PACK: **#2/16 sand** SLOT SIZE:**.020"**

REMARKS	FIELD: WELL	FIELD: SAMP. NO.	FIELD: FIELD READ.	FIELD: BLOWS/6"	FIELD: SAMP TYPE	DEPTH (feet)	USCS CLASS.	SOIL DESCRIPTION
								Asphaltic Concrete
2 inch Diameter Casing			280					SILTY SAND(SM) black stained, dry to moist, medium dense, strong hydrocarbon odor
5% Bentonite Cement Grout			300			2		
								color change to gray green
Bentonite Pellets						4		
#2/16 Sand			300			6		
			300			8		grades moist to wet, fine grained
								color change to red brown
0.02 inch Slot Screen			30			10		grades with some clay, no hydrocarbon odor
			30			12		
								grades with increasing clay content
						14		

AGE

ANANIA GEOLOGIC ENGINEERING

PROJECT NO. 004-88-059

Carnation/Oakland
1310 14th St., Oakland, Ca.

LOG OF PR-78

REMARKS	FIELD					DEPTH (feet)	USCS CLASS.	SOIL DESCRIPTION
	WELL	SAMP. NO.	FIELD READ.	BLOWS / 6"	SAMP TYPE			
			800					Test Boring Terminated at 15 1/2 feet on 7-13-89 Materials: 2 bags #2/16 sand 1/2 bucket bentonite

16
18
20
22
24
26
28
30
32
34
36
38

AGE

ANANIA GEOLOGIC ENGINEERING

PROJECT NO. 004-88-059

Carnation/Oakland
1310 14th St., Oakland, Ca.

LOG OF PR-78

Sheet 2 of 2

DATE STARTED: 7/13/89

DATE COMPLETED: 7/13/89

DRILLING EQUIPMENT: **Hollow Stem Auger**

DRILLING CONTRACTOR: **Accubore**

LOGGED BY: **Jim Wallace**

TOTAL DEPTH: **15.0**

BORING DIAMETER: **6"**

SURFACE CONDITIONS: **Asphalt Pavement**

SURFACE ELEVATION: **14.56**

COORDINATES: **N 2,514.9 E 3,127.4**

GROUNDWATER CONDITIONS:

CASING DEPTH: **15 feet**

FILTER PACK: **#2/16 sand** SLOT SIZE:.020"

REMARKS	FIELD: WELL	FIELD: SAMP. NO.	FIELD: FIELD READ.	FIELD: BLOWS / 6"	FIELD: SAMP TYPE	DEPTH (feet)	USCS CLASS.	SOIL DESCRIPTION
								Asphaltic Concrete
2 inch Diameter Casing			18					Aggregate Baserock
5% Bentonite Cement Grout			28			2		SILTY SAND(SM) black, moist, loose, with nails, wood, brick and concrete (FILL)
Bentonite Pellets						4		SILTY SAND(SM) black, dry to moist, medium dense, grading to red brown
#2/16 Sand			40					color change to green gray
						6		color change to red brown
			40			8		grades with increasing clay and moisture content
0.02 inch Slot Screen						10		
			28			12		no hydrocarbon odor
						14		Test Boring Terminated at 15 feet on 7-13-89 Materials: 2 bags of #2/16 sand 1/2 bucket bentonite
			50					

AGE

ANANIA GEOLOGIC ENGINEERING

PROJECT NO. 004-88-059

Carnation/Oakland
1310 14th St., Oakland, Ca.

LOG OF PR-79

Sheet 1 of 1

DATE STARTED: 7/13/89

DATE COMPLETED: 7/13/89

DRILLING EQUIPMENT: **Hollow Stem Auger**

DRILLING CONTRACTOR: **Accubore**

LOGGED BY: **Jim Wallace**

TOTAL DEPTH: **15.0**

BORING DIAMETER: **6"**

SURFACE CONDITIONS: **Asphalt Pavement**

SURFACE ELEVATION: **14.43**

COORDINATES: **N 2,539.5 E 3,129.5**

GROUNDWATER CONDITIONS:

CASING DEPTH: **15 feet**

FILTER PACK: **#2/16 sand** SLOT SIZE:**.020"**

REMARKS	FIELD: WELL	FIELD: SAMP. NO.	FIELD: FIELD READ.	FIELD: BLOWS / 6"	FIELD: SAMP TYPE	DEPTH (feet)	USCS CLASS.	SOIL DESCRIPTION
2 inch Diameter Casing 5% Bentonite Cement Grout								Asphaltic Concrete Aggregate Baserock SILTY SAND(SM) black, moist, loose, strong hydrocarbon odor (FILL)
Bentonite Pellets #2/16 Sand			200 300			2 4 6		SILTY SAND(SM) green gray, dry to moist, medium dense
0.02 inch Slot Screen			340 20 150			8 10 12 14		no hydrocarbon odor Test Boring Terminated at 15 feet on 7-13-89 Materials: 2 bags of #2/16 sand 1/2 bucket bentonite

AGE

ANANIA GEOLOGIC ENGINEERING

PROJECT NO. 004-88-059

Carnation/Oakland
1310 14th St., Oakland, Ca.

LOG OF PR-80

Sheet 1 of 1

DATE STARTED: 7/13/89

DATE COMPLETED: 7/13/89

DRILLING EQUIPMENT: **Hollow Stem Auger**

DRILLING CONTRACTOR: **Accubore**

LOGGED BY: **Jim Wallace**

TOTAL DEPTH: **15.0**

BORING DIAMETER: **6"**

SURFACE CONDITIONS: **Asphalt Pavement**

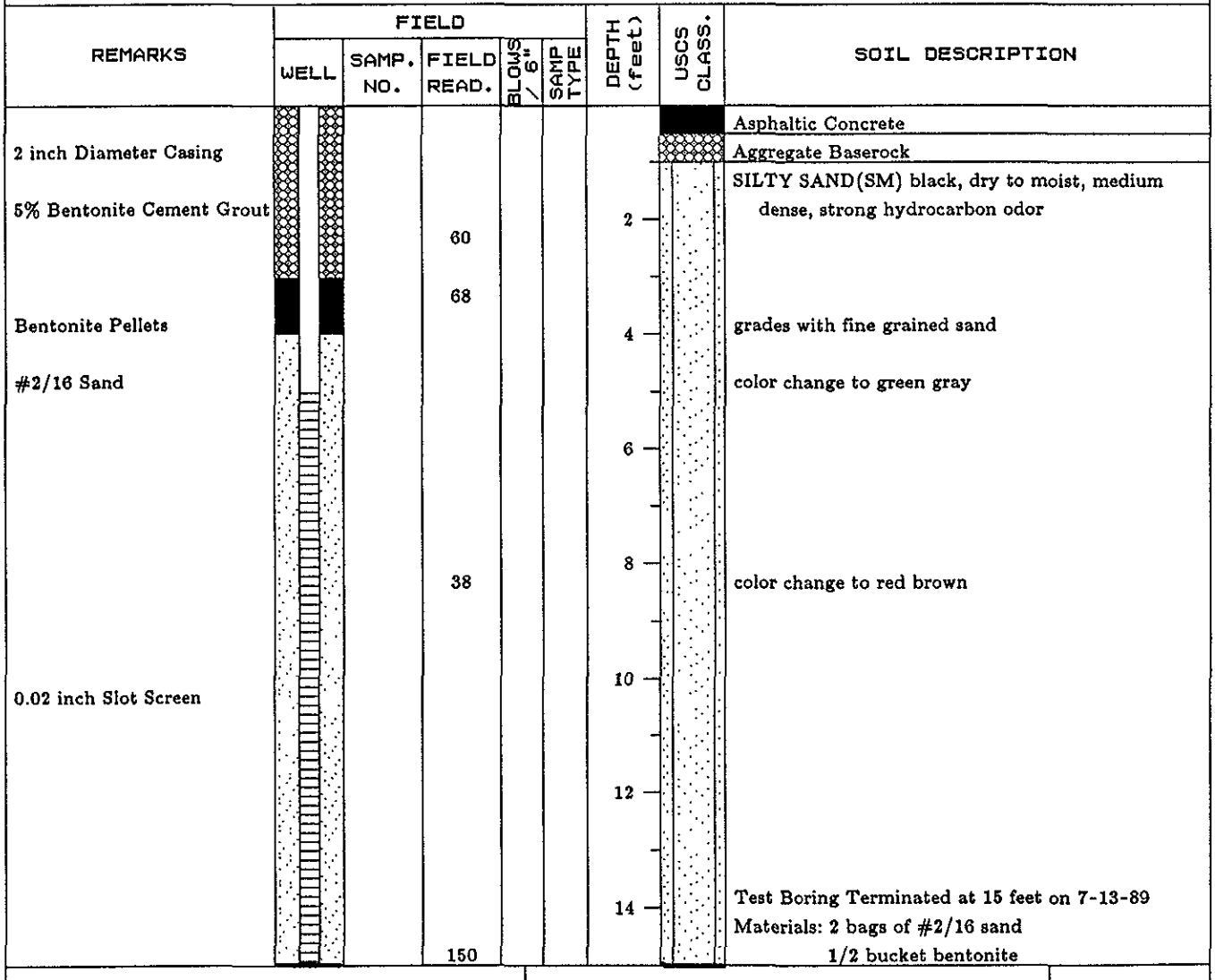
SURFACE ELEVATION: **14.86**

COORDINATES: **N 2,490.3 E 3,155.0**

GROUNDWATER CONDITIONS:

CASING DEPTH: **15 feet**

FILTER PACK: **#2/16 sand** SLOT SIZE:.020"



AGE

ANANIA GEOLOGIC ENGINEERING

PROJECT NO. 004-88-059

Carnation/Oakland
1310 14th St., Oakland, Ca.

LOG OF PR-81

Sheet 1 of 1

APPENDIX C

Analytical Results and Chain of Custody Forms of Bioremediated Surface Soil

Precision Analytical Laboratory, Inc.

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

RECEIVED [illegible] 1989

CERTIFICATE OF ANALYSIS

State License No. 211

Received: 04/14/89
Reported: 04/28/89
Job No #: 70771

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

Project: #004-88-059

Total Petroleum Hydrocarbon Analysis; By EPA 8015
Total Lead: By EPA 6010
mg/kg

Lab ID	Client ID	Gasoline	Diesel	Total Lead
70771-1	AGE #3177	1,670	380	84.9
70771-2	AGE #3178	860	340	23.9
70771-3	AGE #3179	2,480	210	30.0
70771-4	AGE #3180	1,120	425	25.4
70771-5	AGE #3181	810	240	18.2

QA/QC: Spike Recovery for Diesel: 107%
Spike Recovery for Gasoline: 101%
Spike Recovery for Lead: 82%

Detection Limit for Diesel: 10
Detection Limit for Gasoline: 10
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

RECEIVED MAY 01 1989

State License No. 211

Received: 04/14/89
Reported: 04/28/89
Job No #: 70771

Attn: Chris Cerquone
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
70771-1	AGE # 3177	42	48	7.5
70771-2	AGE # 3178	31	25	7.5
70771-3	AGE # 3179	30	25	7.5
70771-4	AGE # 3180	39	66	7.5
70771-5	AGE # 3181	23	29	7.5

Lab ID	Client ID	Ethylbenzene	Xylene	MDL
70771-1	AGE # 3177	29	120	7.5
70771-2	AGE # 3178	3.6	37	7.5
70771-3	AGE # 3179	30	150	7.5
70771-4	AGE # 3180	58	150	7.5
70771-5	AGE # 3181	20	65	7.5

QA/QC: Spike Recovery for BTX Average: 100%

Jaime Chow
Laboratory Director

70771

ANANIA GEOLOGIC ENGINEERING

AGE

RECEIVED MAY 0 1 1989

PROJECT NO.	LAB REPORT NO.	NO. OF CONTAINERS	SAMPLE TYPE			ANALYSES							
004-88-059			SOIL		WATER	TPH	BTXE	Total Lead					
P.O. NO.	SAMPLERS: (signature) Christopher N. Cayetano		COMP	GRAB									
LAB LOG NO.	DATE	TIME	SAMPLE I.D.										REMARKS
	4-14-89	0945	AGE # 3177	Brass Tube		X		X	X	X			
	4-14-89	0955	AGE # 3178	"		X		X	X	X			
	4-14-89	0950	AGE # 3179	"		X		X	X	X			
	4-14-89	1000	AGE # 3180	"		X		X	X	X			
	4-14-89	1005	AGE # 3181	"		X		X	X	X			
										✓			

RELINQUISHED BY: (signature)	DATE/TIME	RECEIVED BY: (signature)
Christopher Cayetano	4-14-89/1430	
RELINQUISHED BY: (signature)	DATE/TIME	RECEIVED BY: (signature)
RELINQUISHED BY: (signature)	DATE/TIME	RECEIVED BY: (signature)

REMARKS:
Standard
Turn Around.

SEND RESULTS TO:
ATTN: Chris Nielson - Cayetano
2145 Rumrill Blvd. Suite 6
San Pablo, CA 94806
PHONE NO. 415 234-4461 ~~(510) 451-0821~~

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

CERTIFICATE OF ANALYSIS

State License No. 211

Received: 05/19/89
Analyzed: 06/01/89
Reported: 06/09/89
Job No #: 70841

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

Project: #004-88-059
Matrix: Soil
Extracted: 05/22/89

Aromatic Volatile Hydrocarbon Analysis:
EPA Method 8020
mg/kg

Lab ID	Client ID	Benzene	Toluene	MDL
70841-1	Composite of #4332, 4333, 4334, 4335 & 4336	2.5	12	2.5

Lab ID	Client ID	Ethylbenzene	Xylene	MDL
70841-1	Composite of #4332, 4333, 4334, 4335 & 4336	6	60	2.5

QA/QC: Spike Recovery for Benzene: 90 %
Spike Recovery for Toluene: 111 %

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: 05/19/89
Analyzed: 06/07/89
Reported: 06/09/89
Job No. #: 70841

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

Project: #004-88-059
Matrix: Soil
Extracted: 05/30/89

CAM [WET] EXTRACTION
Title 22
mg/l

Lab ID	Client ID	Soluble Lead	MDL
70841-1	Composite of #4332, 4333, 4334, 4335 & 4336	10.4	0.044

QA/QC: Spike Recovery for Soluble Lead: 84%

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

STATE LICENSE NO. 211

Received: 05/19/89
Analyzed: 06/07/89
Reported: 06/09/89
Job No. #: 70841

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

Project: #004-88-059
Matrix: Soil
Digested: 05/30/89

Analysis Method EPA 6010
Prep Method 3050
mg/kg

Lab ID	Client ID	Total Lead	MDL
70841-1	Composite of #4332, 4333, 4334, 4335 & 4336	15.1	0.044

QA/QC: Spike Recovery for Total Lead: 84%

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

STATE LICENSE NO. 211

Received: 05/19/89
Analyzed: 05/23/89
Reported: 06/09/89
Job No. #: 70841

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

Project: #004-88-059
Matrix: Soil
Extracted: 05/23/89

Total Petroleum Hydrocarbon Analysis:
By DHS Method (LUFT)
mg/kg

Lab ID	Client ID	Gasoline	Diesel	MDL
70841-1	Composite of #4332, 4333, 4334, 4335 & 4336	1,190	250	10

QA/QC: Spike Recovery for Gasoline: 115%
Spike Recovery for Diesel: 109%

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

Jaime Chow
Laboratory Director

ANANIA GEOLOGIC ENGINEERING

AGE Nº 1514

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

P.O. NO.	SAMPLERS: (signature)
	Chris Cerqueira Mike Hill

LAB LOG NO.	DATE	TIME	SAMPLE I.D.	NO. OF CONTAINERS	SAMPLE TYPE: SOIL COMP	SOIL GRAB	WATER	TPH	BTXE	TTLC Total Lead	STLC Soluble Lead				REMARKS
	5/18/89	0825	#4332	1 Brass Tube	X			X	X	X	X				
	5/18/89	0805	#4333	"	X										
	5/18/89	0810	#4334	"	X										Composite these five samples
	5/18/89	0815	4335	"	X										
	5/18/89	0820	4336	"	X										

Composite Samples

RELINQUISHED BY: (signature)	DATE/TIME	RECEIVED BY: (signature)
Chris Cerqueira	5-18-89/1600	John S Russell
RELINQUISHED BY: (signature)	DATE/TIME	RECEIVED BY: (signature)
John S. Russell	5/19/89 1035 pm	Raj Pandher
RELINQUISHED BY: (signature)	DATE/TIME	RECEIVED BY: (signature)

REMARKS:

Normal turnaround time

SEND RESULTS TO: Chris Cerqueira

ATTN: Anania Geologic Engr.
2145 Rumrill Blvd. Suite 6
San Pablo, CA 94806

PHONE NO. ~~(510)~~ ~~451-0831~~ 415 234-4461

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

CERTIFICATE OF ANALYSIS

STATE LICENSE NO. 211

Received: 06/22/89
Analyzed: 06/29/89
Reported: 06/29/89
Job #: 70898

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

Project: #004-88-059

Analysis Method EPA 6010
STLC
mg/l

Lab ID	Client ID	STLC Lead	MDL	% SPIKE RECOVERY
70898-1	Composite of #4337 - 4341	0.90	0.044	96

Extracted: 06/26/89

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

State License No. 211

Received: 06/22/89
Analyzed: 06/27/89
Reported: 06/29/89
Job No #: 70898

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
mg/kg

Lab ID	Client ID	Gasoline	Diesel
70898-1	Composite of #4337-4341	ND<50	285

Extracted: 06/27/89

QA/QC: Spike Recovery for Gasoline: 89%
Spike Recovery for Diesel: 91%

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

Detection Limit for Diesel: 50
Detection Limit for Gasoline: 50

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: 06/22/89
Analyzed: 06/30/89
Reported: 06/29/89
Job No #: 70898

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

Project: #004-88-059

Total Lead: By EPA 6010;
Prep Method 3050
mg/kg

Lab ID	Client ID	Total Lead
70898-1	Composite of #4337-4341	19

Extracted: 06/30/89

QA/QC: Spike Recovery for Total Lead: 88%

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

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: 06/22/89
Analyzed: 06/23/89
Reported: 06/29/89
Job No #: 70898

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
70898-1	Composite of #4337 - 4341	ND<0.03	ND<0.03	0.03

Lab ID	Client ID	Ethylbenzene	Xylene	MDL
70898-1	Composite of #4337 - 4341	ND<0.03	3.6	0.03

Extracted: 06/23/89

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

Jaime Chow
Laboratory Director

ANANIA GEOLOGIC ENGINEERING

AGE Nº 1517

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

LAB LOG NO.	DATE	TIME	SAMPLE I.D.	NO. OF CONTAINERS	SAMPLE TYPE: SOIL COMP	SOIL GRAB	WATER	TPH as gas	TPH as diesel	BTXE	Total Lead	Soluble Lead			REMARKS
	6/22/89	1315 ~~1345~~	# 4337	1 brass tube		X									
	6/22/89	1320	#4338	11		X		Composite these Samples							** Composite these 5 soil Samples!!
	6/22/89	1325	#4339	11		X		X	X	X	X	X			
	6/22/89	1330	#4340	11		X									
	6/22/89	1335	#4341	11		X									5-Day Turn-around on Samples

RELINQUISHED BY: (signature)	DATE/TIME	RECEIVED BY: (signature)
Christian Cerqueone	6-22-89/1640	
RELINQUISHED BY: (signature)	DATE/TIME	RECEIVED BY: (signature)
RELINQUISHED BY: (signature)	DATE/TIME	RECEIVED BY: (signature)

REMARKS: Also send results to:
Attn: Mary Scruggs
AGE
11330 Rumrill Blvd. Suite C
Rancho Cordova, CA
94752

SEND RESULTS TO:
ATTN: Chris Cerqueone
AGE
2145 Rumrill Blvd. Suite C
San Pablo, CA 94806
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

CERTIFICATE OF ANALYSIS

State License No. 211

Received: 06/30/89
Analyzed: 07/03/89
Reported: 07/11/89
Job No. #: 70913

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
70913-1	Composite of #4409, #4410, #4411, #4412, #4413	ND<0.03	0.09	0.03

Lab ID	Client ID	Ethylbenzene	Xylene	MDL
70913-1	Composite of #4409, #4410, #4411, #4412, #4413	0.08	0.90	0.03

Extracted: 07/03/89

QA/QC: Spike Recovery for Benzene: 97%

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

Surinder Sidhu
Surinder Sidhu
Senior Chemist

Revised: 8/4/89

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: 06/30/89
Analyzed: 07/05/89
Reported: 07/11/89
Job #: 70913

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

Project: #004-88-059

Analysis Method EPA 6010
STLC
mg/l

Lab ID	Client ID	STLC Lead	MDL	% SPIKE RECOVERY
70913-1	Composite of #4409, 4410, 4411, #4412 & 4413	1.6	0.044	85

Extracted: 07/03/89

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

Surinder Sidhu
Surinder Sidhu
Senior Chemist

Revised: 8/4/89

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: 06/30/89
Analyzed: 07/10/89
Reported: 07/11/89
Job No. #: 70913

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
mg/kg

Lab ID	Client ID	Diesel	Gasoline
70913-1	Composite of #4409, #4410, #4411, #4412, #4413	280	18

Extracted: 07/10/89

QA/QC: Spike Recovery for Gasoline: 100.5%

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

Detection Limit for Diesel: 50
Detection Limit for Gasoline: 10

Surinder Sidhu
Surinder Sidhu
Senior Chemist

Revised: 8/4/89

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: 06/30/89
Analyzed: 07/06/89
Reported: 07/11/89
Job #: 70913

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

Project: #004-88-059

Lead Analysis Method EPA 6010
Prep Method 3050
mg/kg

Lab ID	Client ID	Lead	MDL	% SPIKE RECOVERY
70913-1	Composite of #4409, 4410, 4411, #4412 & 4413	48.0	1.1	74

Prepared: 07/06/89

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

Surinder Sidhu
Surinder Sidhu
Senior Chemist

Revised: 8/4/89

ANANIA GEOLOGIC ENGINEERING

AGE Nº 142

PROJECT NO.	LAB REPORT NO.	NO. OF CONTAINERS	SAMPLE TYPE			ANALYSES							
004-88-059			SOIL		WATER	TPH modified 8015	BTXE modified 8020	Total Lead (Soluble Lead)					
P.O. NO.	SAMPLERS: (signature) Michael C. Hill												
LAB LOG NO.	DATE	TIME	SAMPLE I.D.			COMP	GRAB								REMARKS
	6-30	1235	NW Corner 4409	1 brass tube		X			X	X	X				
	6-30	1238	NE Corner 4410	1 brass tube		X			X	X	X				
	6-30	1241	Center 4411	1 brass tube		X			X	X	X				Analyze as Composite
	6-30	1243	SW Corner 4412	1 brass tube		X			X	X	X				
	6-30	1246	SE Corner 4413	1 brass tube		X			X	X	X				

RELINQUISHED BY: (signature)	DATE/TIME	RECEIVED BY: (signature)	REMARKS:	SEND RESULTS TO: AGE
Michael C. Hill	6-30-87/1445	Raj Pandher	Run as composite Send cy of chain of custody and results to San Pablo office	ATTN: Chris Croquere 2145 Rumrill Blvd Suite G San Pablo Ca 94806
RELINQUISHED BY: (signature)	DATE/TIME	RECEIVED BY: (signature)		PHONE NO. ~~(916) 451-0921~~ 415 234 4401
RELINQUISHED BY: (signature)	DATE/TIME	RECEIVED BY: (signature)		

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

CERTIFICATE OF ANALYSIS

STATE LICENSE NO. 211

Received: 07/10/89
Analyzed: 07/11/89
Reported: 07/12/89
Job No. #: 70930

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
mg/kg

Lab ID	Client ID	Diesel	Gasoline
70930-1	Composite of #3282, #3283, #3284, #3286, #3287	213	54

Extracted: 07/11/89

QA/QC: Spike Recovery for Diesel: 106.8%
Spike Recovery for Gasoline: 112.1%

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

Detection Limit for Diesel: 100
Detection Limit for Gasoline: 10

Surinder Sidhu
Senior Chemist

Revised: 8/4/89

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: 07/10/89
Analyzed: 07/11/89
Reported: 07/12/89
Job No. #: 70930

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
70930-1	Composite of #3282, 3283, 3284, #3286 & 3287	ND<0.03	ND<0.03	0.03

Lab ID	Client ID	Ethylbenzene	Xylene	MDL
70930-1	Composite of #3282, 3283, 3284, #3286 & 3287	ND<0.03	0.80	0.03

Extracted: 07/11/89

QA/QC: Spike Recovery for Benzene: 86%

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

Surinder Sidhu
Surinder Sidhu
Senior Chemist

Revised: 8/4/89

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: 07/10/89
Analyzed: 07/13/89
Reported: 07/12/89
Job #: 70930

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

Project: #004-88-059

Lead Analysis Method EPA 6010
Prep Method 3010
mg/kg

Lab ID	Client ID	Lead	MDL	% SPIKE RECOVERY
70930-1	Composite of #3282, 3283, 3284, #3286 & 3287	25	1.1	90.3

Extracted: 07/11/89

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

Surinder Sidhu
Surinder Sidhu
Senior Chemist

Revised: 8/4/89

AGE

ANANIA GEOLOGIC ENGINEERING

PROJECT NO.	LAB REPORT NO.
-059	

P.O. NO.	SAMPLERS: (signature)
	Michael Hill / Kathy Abo

LAB LOG NO.	DATE	TIME	SAMPLE I.D.	NO. OF CONTAINERS	SAMPLE TYPE: SOIL COMP	SOIL GRAB	WATER	ANALYSES: TPH as Diesel	BTXE Total Lead Soluble Lead	REMARKS
	7-10	1005	NW Corner 3252	1 brass tube	X			X		
	7-10	1015	Center 3253	1 brass tube	X			X		Run as
	7-10	1035	NE Corner 3254	1 brass tube	X			X		Composite
	7-10	1030	SW Corner 3256	1 brass tube	X			X		
	7-10	1040	SE Corner 3257	1 brass tube	X			X		

RECEIVED JUL 7 1989

RELINQUISHED BY: (signature)	DATE/TIME	RECEIVED BY: (signature)
Michael A. Hill	7-10-89/1630	Raj Pandher
RELINQUISHED BY: (signature)	DATE/TIME	RECEIVED BY: (signature)
RELINQUISHED BY: (signature)	DATE/TIME	RECEIVED BY: (signature)

REMARKS: Run as composite - 5 DAY TURNaround Time

SEND RESULTS TO: AGE
ATTN: Chris Cerqueira
2415 Rumrill Blvd
Suite G
San Pablo, Ca. 94806
PHONE NO. (415) 234-4661

CHAIN OF CUSTODY

White - AGE Yellow - LAB Copy Pink - File

RECEIVED JUL 2 1 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: 07/13/89
Reported: 07/18/89
Job No #: 70938

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

Aromatic Volatile Hydrocarbon Analysis:
EPA Method 8020
mg/kg

Lab ID	Client ID	Benzene	Toluene	MDL
70938-1	Composite of #3293 & 3294	ND<0.03	ND<0.03	0.03

Lab ID	Client ID	Ethylbenzene	Xylene	MDL
70938-1	Composite of #3293 & 3294	ND<0.03	0.06	0.03

QA/QC: Spike Recovery for Toluene: 83%

Surinder Sidhu
Surinder Sidhu
Senior Chemist

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: 07/13/89
Reported: 07/18/89
Job No. #: 70938

Attn: Mary Scruggs
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	Gasoline	Diesel	MDL
70938-1	Composite of #3293 & 3294	34	110	10

QA/QC: Spike Recovery for Diesel: 99%
Spike Recovery for Gasoline: 100%

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

Surinder Sidhu
Surinder Sidhu
Senior Chemist

ANANIA GEOLOGIC ENGINEERING

AGE № 1435

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

P.O. NO.	SAMPLERS: (signature)
	Michael C. Hill

LAB LOG NO.	DATE	TIME	SAMPLE I.D.	NO. OF CONTAINERS	SAMPLE TYPE: SOIL COMP	SAMPLE TYPE: SOIL GRAB	SAMPLE TYPE: WATER	ANALYSES	REMARKS
	7-12	0950	3293 w end pile	1 brass tube		X			Composite and run TPH as gas, TPH as Diesel, BTXE
	7-12	0955	3294 E. end pile	1 brass tube		X			

RELINQUISHED BY: (signature)	DATE/TIME	RECEIVED BY: (signature)
Michael C. Hill	7-13-89/0920	Raj Pandher
RELINQUISHED BY: (signature)	DATE/TIME	RECEIVED BY: (signature)
RELINQUISHED BY: (signature)	DATE/TIME	RECEIVED BY: (signature)

REMARKS: 5 Day turnaround

SEND RESULTS TO: AGE
ATTN: Mary Scruggs
11330 Sunrise Park Blvd
Rancho Cordova Ca 95742
PHONE NO. ~~(916) 451-0921~~
(916) 631-0154

CHAIN OF CUSTODY

White - AGE Yel - LA Cop - F

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: 08/01/89
Analyzed: 08/03/89
Reported: 08/07/89
Job No. #: 70986

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

Project: #004-88-059
Sample Matrix: Soil

Total Petroleum Hydrocarbon Analysis
By Modified Method 8015
mg/kg

Lab ID	Client ID	Diesel	Gasoline	MDL
70986-1	#3322	40	ND<10	10
70986-2	#3323	20	ND<10	10
70986-3	#3324	30	ND<10	10
70986-4	#3325	44	ND<10	10
70986-5	#3326	90	ND<10	10
70986-6	#3327	70	ND<10	10
70986-7	#3328	37	ND<10	10
70986-8	#3329	70	ND<10	10

Extracted: 08/02/89

QA/QC: Spike Recovery for Diesel: 103%
Spike Recovery for Gasoline: 99%

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

State License No. 211

Received: 08/01/89
Analyzed: 08/02/89
Reported: 08/04/89
Job No #: 70986

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

Project: #004-88-059
Sample Matrix: Soil

Aromatic Volatile Hydrocarbon Analysis:
EPA Method 8020
mg/kg

Lab ID	Client ID	Benzene	Ethyl-benzene	Toluene	Xylenes	MDL
70986-1	3322	ND<0.03	ND<0.03	0.06	0.24	0.03
70986-2	3323	ND<0.03	ND<0.03	ND<0.03	0.04	0.03
70986-3	3324	ND<0.03	ND<0.03	ND<0.03	0.05	0.03
70986-4	3325	ND<0.03	ND<0.03	ND<0.03	0.05	0.03
70986-5	3326	ND<0.03	ND<0.03	ND<0.03	ND<0.03	0.03
70986-6	3327	ND<0.03	ND<0.03	ND<0.03	0.04	0.03
70986-7	3328	0.06	0.1	0.07	0.6	0.03
70986-8	3329	ND<0.03	ND<0.03	ND<0.03	0.06	0.03

Extracted: 08/02/89

QA/QC: Spike Recovery for Benzene: 96%
Spike Recovery for Toluene: 95%
Spike Recovery for O-Xylene: 94%

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: 08/01/89
Analyzed: 08/02/89
Reported: 08/07/89
Job No #: 70986

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

Project: #004-88-059
Sample Matrix: Soil

Total Lead Analysis; By EPA 6010
Prep Method 3050
mg/kg

Lab ID	Client ID	Total Lead	MDL
70986-1	#3322	20	1.1
70986-2	#3323	36	1.1
70986-3	#3324	33	1.1
70986-4	#3325	25	1.1
70986-5	#3326	22	1.1
70986-6	#3327	22	1.1
70986-7	#3328	24	1.1
70986-8	#3329	25	1.1

Prepared: 08/02/89

QA/QC: Spike Recovery for Lead: 80%

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

Jaime Chow
Laboratory Director

ANANIA GEOLOGIC ENGINEERING

AGE № 1897

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

P.O. NO.	SAMPLERS: (signature)
	Michael C Hill

LAB LOG NO.	DATE	TIME	SAMPLE I.D.	NO. OF CONTAINERS	SAMPLE TYPE: SOIL COMP	SOIL GRAB	WATER	ANALYSES: TPH as gas + Diesel	BTXE	Total lead					REMARKS
	8-1-89	0945	3322	1 Brass tube		X		X	X	X					
	8-1-89	0950	3323	1 Brass tube		X		X	X	X					
	8-1-89	0955	3324	1 Brass tube		X		X	X	X					
	8-1-89	1000 ~~0900~~	3325	1 Brass tube		X		X	X	X					
	8-1-89	1005	3326	1 Brass tube		X		X	X	X					
	8-1-89	1010	3327	1 Brass tube		X		X	X	X					
	8-1-89	1015	3328	1 Brass tube		X		X	X	X					
	8-1-89	1020	3329	1 Brass tube		X		X	X	X					

RELINQUISHED BY: (signature)	DATE/TIME	RECEIVED BY: (signature)
Michael C Hill	8-1-89/1635	Raj Pandher
RELINQUISHED BY: (signature)	DATE/TIME	RECEIVED BY: (signature)
RELINQUISHED BY: (signature)	DATE/TIME	RECEIVED BY: (signature)

REMARKS: Send a copy of results to: AGE, attn: Chris Cerquone, 2415 Rumrill Blvd, Suite 6, San Pablo Ca 94806.
5 Day turnaround time

SEND RESULTS TO: AGE
ATTN: Mary Scruggs
11330 Sunrise Park Blvd Suite C
Rancho Cordova, Ca 95742
PHONE NO. (916) ~~638-0921~~ 631-0134

CHAIN OF CUSTODY

White - AGE Yellow - LAB Copy Pink - File

ATT

April 28, 1989

Mr. Christopher Cerquone
Anania Geologic Engineering
2145 Rumrill Blvd.
San Pablo, CA 95806

Subject: Hazardous Waste Toxicity Test Results of Composite Soil Sample 8328 (AGE-3185).

Dear Mr. Cerquone:

This report presents the toxicity test results for fathead minnow (Pimephales promelas) exposed to concentrations of a composite soil sample provided by you, from AGE, for Aqua Terra Technologies, Inc..

Aqua Terra Technologies
Consulting Engineers
& Scientists

2950 Buskirk Avenue
Suite 120
Walnut Creek, CA
94596
415 934-4884

METHODS

All tests were conducted according to Aqua Terra Technologies (ATT) hazardous waste aquatic toxicity test protocol based on Standard Methods for the Examination of Water and Wastewater, 16th Edition, American Public Health Association, 1986, and certified by the State of California Department of Health Services (copy of certificate attached). The soil sample was tested at three concentrations, 250 mg/L, 500 mg/L, and 750 mg/L. The soil sample was thoroughly mixed into dechlorinated tap water using a wrist action shaker. All treatments were run in duplicate with 10 fish per three liter tank and a total of 20 fish per treatment. Temperature was controlled at 20 $\pm$ 2^{o}C and photoperiod regulated at approximately 16-hours light and 8-hours dark. Fish were acclimated in the test laboratory for 21 days prior to their use in the test.

Fish mortality, temperature, pH, and dissolved oxygen concentration were monitored during the 96-hour test. Water alkalinity and hardness were measured for dilution water and the highest treatment concentration at the beginning of the test.

TEST RESULTS

No fish mortality occurred in the dilution water control or in any sample treatment for sample 8328 (AGE-3185). The surviving fish in all treatments did not appear stressed (ie, lathargic). The raw data from tests are summarized in the attached data sheets.

Test results indicate that the 96-hour LC50 value for the soil sample 8328 (AGE-3185) is greater than 500 mg/L (>750 mg/L). The soil sample 8328 (AGE-3185) therefore does not meet the acute aquatic toxicity test criteria (96-hour LC50 $\leq$ 500 mg/L) for identification of a material as hazardous, according to the specification in the California Administration Code, Title 22, Division 4, Article 11, Section 66696.

Should any questions arise as to test procedures or results, do not hesitate to call.

Very truly yours,

AQUA TERRA TECHNOLOGIES, INC.

Ronald M. Block, PhD.
Laboratory Director

William E. Foster, M.S.
Laboratory Manager
Aquatic Biologist

RMB/WEF

Enclosures: Bioassay Data Sheets
Chain of Custody
Certificate
Invoice

ATT

FISH BIOASSAY MEASUREMENTS

Fathead Minnows

For: Anania Geologic Engineering: Mr. Cerquone

Sample ID#: 8328 Sample Conc. Soil

Client ID#: AGE-3185

Average Length:	31.0 mm SL	Average Weight:	0.368g
Maximum Length:	35.0 mm SL	Maximum Weight:	0.57 g
Minimum Length:	27.0 mm SL	Minimum Weight:	0.22 g

	Fish Length (mm SL)		Fish Weight (g)
1.	34.0	1.	0.50
2.	33.0	2.	0.39
3.	35.0	3.	0.57
4.	32.0	4.	0.41
5.	33.0	5.	0.45
6.	28.0	6.	0.26
7.	28.0	7.	0.24
8.	27.0	8.	0.22
9.	33.0	9.	0.38
10.	27.0	10.	0.26

LABORATORY MANAGER: William E. Foster

William E. Foster, M.S.

Aquatic Biologist

STATIC ACUTE BIOASSAY
(Hazardous Waste Test)

Aqua Terra Technologies
2950 Buskirk Avenue
Walnut Creek, CA 94596
415 934-4884

CLIENT: Anania Geologic Engineering (AGE) ATTENTION: Mr. Cerquone

SAMPLE ID#: 8328 SAMPLE DESCRIPTION: Control-dechlorinated tap TESTING DATES: 4/20/89 to 4/24/89
Client ID#: (AGE-3185)

	INITIAL						24-HOUR				48-HOUR				72-HOUR				96-HOUR			
TEST CONC mg/L	Alk mg/L	Hard mg/L	Live	pH	DO mg/L	Temp oC	Live	pH	DO mg/L	Temp oC	Live	pH	DO mg/L	Temp oC	Live	pH	DO mg/L	Temp oC	Live	pH	DO mg/L	Temp oC
C-1	25	44	10	7.7	7.9	21	10	7.9	8.1	19	10	7.9	8.2	19	10	7.6	8.0	18	10	7.8	8.3	20
C-2	25	44	10	7.6	7.7	21	10	7.9	8.4	19	10	7.9	8.6	19	10	7.7	8.4	18	10	7.8	8.3	20

Test Species fathead minnow Avg Length 31.0 mm SL Max Length 35.0 mm SL Min Length 27.0 mm SL

Source of Test Species Thomas Fish Company Avg Wt 0.368 g Max Wt 0.57 g Min Wt 0.22 g

Species Density 10/tank 20/treatment Dilution Water dechlorinated tap Test Soln Vol 3 L Depth 17 cm Aeration Bubble

Acclimation Tank % Dead 0 Accl. Tank Water dechlorinated tap Accl. Period 21 days Accl. Temp. 20 +/- 2°C

REMARKS:

96 hr LC50 n/a

95% Confidence Limits n/a

Percent Survival 100%.

TECHNICIAN: Richard Daggett
Richard Daggett, B.A.

LABORATORY MANAGER:
William E. Foster, M.S

STATIC ACUTE BIOASSAY
(Hazardous Waste Test)

Aqua Terra Technologies
2950 Buskirk Avenue
Walnut Creek, CA 94596
415 934-4884

CLIENT: AGE ATTENTION: Mr. Cerquone

SAMPLE ID#: 8328 SAMPLE DESCRIPTION: Soil (AGE-3185) TESTING DATES: 4/20/89 - 4/24/89

	INITIAL						24-HOUR				48-HOUR				72-HOUR				96-HOUR			
TEST CONC mg/L	Alk mg/L	Hard mg/L	Live	pH	DO mg/L	Temp oC	Live	pH	DO mg/L	Temp oC	Live	pH	DO mg/L	Temp oC	Live	pH	DO mg/L	Temp oC	Live	pH	DO mg/L	Temp oC
250 A			10	7.5	7.9	21	10	7.8	8.3	19	10	7.5	7.9	19	10	7.6	7.8	18	10	7.7	8.1	20
250 B			10	7.5	7.9	21	10	7.8	8.3	19	10	7.6	7.9	19	10	7.5	7.9	18	10	7.7	8.1	20
500 A			10	7.5	8.0	21	10	7.8	8.4	19	10	7.7	8.3	19	10	7.6	8.1	18	10	7.7	8.1	20
500 B			10	7.9	8.0	21	10	7.7	8.4	19	10	7.6	7.9	19	10	7.7	8.0	18	10	7.7	8.1	20
750 A	25	25	10	7.7	7.9	21	10	7.9	8.2	19	10	7.7	8.5	19	10	7.8	8.1	18	10	7.7	8.1	20
750 B	25	25	10	7.7	8.0	21	10	7.9	8.4	19	10	7.7	8.4	19	10	7.6	8.2	18	10	7.7	8.1	20

Test Species fathead minnow Avg Length 31.0 mm SL Max Length 35.0 mm SL Min Length 27.0 mm SL

Source of Test Species Thomas Fish Company Avg Wt 0.368 g Max Wt 0.57 g Min Wt 0.22 g

Species Density 10/tank 20/treatment Dilution Water dechlorinated tap Test Soln Vol 3 L Depth 17 cm Aeration Bubble

Acclimation Tank % Dead 0 Accl. Tank Water dechlorinated tap Accl. Period 21 days Accl. Temp. 20 +/- 2°C

REMARKS:

TECHNICIAN: Richard Daggett
Richard Daggett, B.A.

96 hr LC50 >500 mg/L. (>750 mg/L).

95% Confidence Limits n/a

LABORATORY MANAGER: William E. Foster
William E. Foster, M.S.

Percent Survival 100% in all sample treatments.

ANANIA GEOLOGIC ENGINEERING

AGE

PROJECT NO.	LAB REPORT NO.	NO. OF CONTAINERS	SAMPLE TYPE			ANALYSES							
004-88-057			SOIL		WATER	TPHe 22 Fish Tox. Test							
P.O. NO.	SAMPLERS: (signature) Christopher Cerqueira		COMP	GRAB									
LAB LOG NO.	DATE	TIME	SAMPLE I.D.										REMARKS
	4-19-89	1045	AGE# 3185	brass tube	X			X					

RELINQUISHED BY: (signature)	DATE/TIME	RECEIVED BY: (signature)	REMARKS:	SEND RESULTS TO:
Christopher Cerqueira	4-19-89/1450	Bill Foster 4/19/89 1440		ATTN: Christopher Cerqueira
RELINQUISHED BY: (signature)	DATE/TIME	RECEIVED BY: (signature)		AGE 2145 Rumrill Blvd San Pablo, CA 95806
RELINQUISHED BY: (signature)	DATE/TIME	RECEIVED BY: (signature)		PHONE NO. ~~(510) 451-0821~~ (415) 234-4461

CHAIN OF CUSTODY

White- AGE Yellow – LAB Copy Pink- File

ATT

July 25, 1989

Mr. Christopher Cerquone
Anania Geologic Engineering
11330 Sunrise Park Dr., Suite C
Rancho Cordova, CA 95742

Subject: Hazardous Waste Toxicity Test Results of Composite Soil Sample 8403 (#1729).

Dear Mr. Cerquone:

This report presents the toxicity test results for fathead minnow (Pimephales promelas) exposed to concentrations of a composite soil sample provided by you for Anania Geologic Engineering.

Aqua Terra Technologies
Consulting Engineers
& Scientists

2950 Buskirk Avenue
Suite 120
Walnut Creek, CA
94596
415 934-4884

METHODS

All tests were conducted according to Aqua Terra Technologies (ATT) hazardous waste aquatic toxicity test protocol based on Standard Methods for the Examination of Water and Wastewater, 16th Edition, American Public Health Association, 1986, and certified by the State of California Department of Health Services (copy of certificate attached). The soil sample was tested at three concentrations, 250 mg/L, 500 mg/L, and 750 mg/L. The soil sample was thoroughly mixed into dechlorinated tap water using a wrist action shaker. All treatments were run in duplicate with 10 fish per three liter tank and a total of 20 fish per treatment. Temperature was controlled at 20 $\pm$ 2^{o}C and photoperiod regulated at approximately 16-hours light and 8-hours dark. Fish were acclimated in the test laboratory for 28 days prior to their use in the test.

Fish mortality, temperature, pH, and dissolved oxygen concentration were monitored during the 96-hour test. Water alkalinity and hardness were measured for dilution water and the highest treatment concentration at the beginning of the test.

TEST RESULTS

No fish mortality occurred in the dilution water control or in any sample treatment for sample 8403 (#1729). The surviving fish in all treatments did not appear stressed (ie, lathargic). The raw data from tests are summarized in the attached data sheets.

ATT

Test results indicate that the 96-hour LC50 value for the soil sample 8403 (#1729)) is greater than 500 mg/L (>750 mg/L). The soil sample 8403 (#1729) therefore does not meet the acute aquatic toxicity test criteria (96-hour LC50 $\leq$ 500 mg/L) for identification of a material as hazardous, according to the specification in the California Administration Code, Title 22, Division 4, Article 11, Section 66696.

Should any questions arise as to test procedures or results, do not hesitate to call.

Very truly yours,

AQUA TERRA TECHNOLOGIES, INC.

Ronald M. Block, PhD.
Laboratory Director

William E. Foster, M.S.
Laboratory Manager
Aquatic Biologist

RMB/WEF

Enclosures: Bioassay Data Sheets
Chain of Custody
Certificate
Invoice

STATIC ACUTE BIOASSAY
(Hazardous Waste Test)

Aqua Terra Technologies
2950 Buskirk Avenue
Walnut Creek, CA 94596
415 934-4884

CLIENT: Anania Geologic Engineering (AGE) ATTENTION: Mr. Cerquone

SAMPLE ID#: 8403 SAMPLE DESCRIPTION: Control-dechlorinated tap TESTING DATES: 7/15/89 to 7/19/89
Client ID#: (#1729)

	INITIAL						24-HOUR				48-HOUR				72-HOUR				96-HOUR			
TEST CONC mg/L	Alk mg/L	Hard mg/L	Live	pH	DO mg/L	Temp oC	Live	pH	DO mg/L	Temp oC	Live	pH	DO mg/L	Temp oC	Live	pH	DO mg/L	Temp oC	Live	pH	DO mg/L	Temp oC
C-1	27	43	10	7.6	8.2	20	10	8.2	6.9	20	10	8.2	8.0	20	10	7.6	8.2	20	10	7.5	8.4	20
C-2	27	43	10	7.6	8.3	20	10	8.2	7.9	20	10	8.2	8.0	20	10	7.6	8.4	20	10	7.5	8.4	20

Test Species fathead minnow Avg Length 34.5 mm SL Max Length 44.0 mm SL Min Length 27.0 mm SL

Source of Test Species Thomas Fish Company Avg Wt 0.584 g Max Wt 1.00 g Min Wt 0.27 g

Species Density 10/tank 20/treatment Dilution Water dechlorinated tap Test Soln Vol 3 L Depth 17 cm Aeration Bubble

Acclimation Tank % Dead 0 Accl. Tank Water dechlorinated tap Accl. Period 28 days Accl. Temp. 20 +/- 2°C

REMARKS:

TECHNICIAN: RD
Richard Daggett, B.A.

96 hr LC50 n/a

95% Confidence Limits n/a

LABORATORY MANAGER: William E. Foster
William E. Foster, M.S.

Percent Survival 100%.

RECEIVED JUL 1989

STATIC ACUTE BIOASSAY
(Hazardous Waste Test)

Aqua Terra Technologies
2950 Buskirk Avenue
Walnut Creek, CA 94596
415 934-4884

CLIENT: AGE ATTENTION: Mr. Cerquone

SAMPLE ID#: 8403 SAMPLE DESCRIPTION: Soil (#1729) TESTING DATES: 7/15/89 - 7/19/89

	INITIAL						24-HOUR				48-HOUR				72-HOUR				96-HOUR			
TEST CONC mg/L	Alk mg/L	Hard mg/L	Live	pH	DO mg/L	Temp oC	Live	pH	DO mg/L	Temp oC	Live	pH	DO mg/L	Temp oC	Live	pH	DO mg/L	Temp oC	Live	pH	DO mg/L	Temp oC
250 A			10	7.6	8.5	20	10	7.8	8.2	20	10	7.7	8.1	20	10	7.6	8.4	20	10	7.6	8.4	20
250 B			10	7.6	8.5	20	10	7.8	8.1	20	10	7.7	8.1	20	10	7.5	8.5	20	10	7.6	8.4	20
500 A			10	7.6	8.4	20	10	7.9	8.2	20	10	7.8	8.1	20	10	7.6	8.4	20	10	7.6	8.4	20
500 B			10	7.6	8.5	20	10	7.9	8.2	20	10	7.8	8.1	20	10	7.6	8.6	20	10	7.6	8.4	20
750 A	23	50	10	7.5	8.5	20	10	7.7	7.9	20	10	7.9	8.1	20	10	7.5	8.1	20	10	7.6	8.4	20
750 B	23	50	10	7.5	8.4	20	10	7.9	8.2	20	10	7.9	8.1	20	10	7.5	8.3	20	10	7.6	8.4	20

Test Species fathead minnow Avg Length 34.5 mm SL Max Length 44.0 mm SL Min Length 27.0 mm SL

Source of Test Species Thomas Fish Company Avg Wt 0.584 g Max Wt 1.00 g Min Wt 0.27 g

Species Density 10/tank 20/treatment Dilution Water dechlorinated tap Test Soln Vol 3 L Depth 17 cm Aeration Bubble

Acclimation Tank % Dead 0 Accl. Tank Water dechlorinated tap Accl. Period 28 days Accl. Temp. 20 +/- 2°C

REMARKS:

TECHNICIAN: RD
Richard Daggett, B.A.

96 hr LC50 >500 mg/L. (>750 mg/L).

95% Confidence Limits n/a

LABORATORY MANAGER: William E. Foster
William E. Foster, M.S.

Percent Survival 100% in all sample treatments.

RECEIVED 1989

ATT

FISH BIOASSAY MEASUREMENTS

Fathead Minnows

For: Anania Geologic Engineering: Mr. Cerquone

Sample ID#: 8403 Sample Conc. Soil

Client ID#: #1729

Average Length: 34.5 mm SL Average Weight: 0.584g

Maximum Length: 44.0 mm SL Maximum Weight: 1.00 g

Minimum Length: 27.0 mm SL Minimum Weight: 0.24 g

	Fish Length (mm SL)		Fish Weight (g)
1.	32.0	1.	0.35
2.	31.0	2.	0.52
3.	27.0	3.	0.27
4.	44.0	4.	1.00
5.	39.0	5.	0.85
6.	36.0	6.	0.65
7.	30.0	7.	0.38
8.	37.0	8.	0.52
9.	32.0	9.	0.50
10.	37.0	10.	0.80

LABORATORY MANAGER: William E. Foster

William E. Foster, M.S.

Aquatic Biologist

ANANIA GEOLOGIC ENGINEERING

AGE Nº 1530

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

P.O. NO.	SAMPLERS: (signature)
	Chris Ohl

LAB LOG NO.	DATE	TIME	SAMPLE I.D.	NO. OF CONTAINERS	SAMPLE TYPE: SOIL COMP	SOIL GRAB	WATER	ANALYSES: Title 22 Fish Tox.	REMARKS
	7-14	10:00	1729	4	X			X	

RELINQUISHED BY: (signature)	DATE/TIME	RECEIVED BY: (signature)
Chris Ohl	7-14-88 2:00	
RELINQUISHED BY: (signature)	DATE/TIME	RECEIVED BY: (signature)
RELINQUISHED BY: (signature)	DATE/TIME	RECEIVED BY: (signature)

REMARKS: (TAT)

Agon Terra Tech.

SEND RESULTS TO:

ATTN: Chris

AGE ENERGY MINERALS ENVIRONMENTAL

ANANIA GEOLOGIC ENGINEERING

11330 Sunrise Park Dr., Suite C

Rancho Cordova, CA 95742

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

916-631-0154

CHAIN OF CUSTODY

White - AGE Yellow - LAB Copy Pink - File

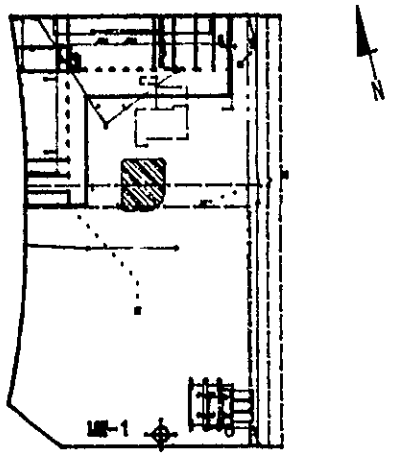
APPENDIX D

Monitoring Well Boring Logs
(MW-1 through MW-16)

ANANIA GEOLOGIC ENGINEERING

BORING LOG

LOCATION OF BORING



SITE/LOCATION	CARNATION/OAKLAND				BORING NO. MW-1
PROJECT NO.	004-68-059				
WATER LEVEL ELEVATION	5.55	5.89	5.54	5.28	SHEET 1 OF 3
TIME					DRILLER
DATE	4-25-89	6-7-89	7-5-89	7-31-89	START TIME 8:50 / FINISH TIME 11:50
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 140# HAMMER 30" DROP, MODIFIED CALIFORNIA SAMPLER

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

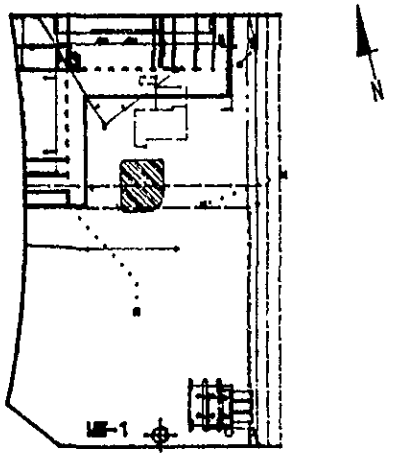
REVIEWED BY: M.A.M. DATE 7-5-89

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		ASPHALTIC CONCRETE
1		4¢ BENTONITE CEMENT SLURRY				X	5	GP	SANDY GRAVEL- BLACK-BROWN, DRY TO MOIST, CLASTS ARE ANGULAR 3/4" GRAY,
				0		X	5		QUARTZ, MAFICS, MEDIUM DENSE, NO HYDROCARBON ODOR.
2						X	5		
						X	6	SM	
3				0		X	7		
						X	6		
4	BLANK	3/8" BENT. PELLETS				X	8		SILTY SAND- RED-BROWN, MOIST, MEDIUM DENSE, AREAS OF OXIDATION,
						X	8		QUARTZ, MAFICS, NO HYDROCARBON ODOR.
5				0	3649	X	5		
						X	7		
6						X	7		
				0		X	7		
7						X	6		
						X	10		
8						X	5		
				0		X	5		
9						X	10		
						X	7		NO HYDROCARBON ODOR.
10				0	3650	X	8		
						X	10		
11						X	10		
						X	10		
12						X	15		GRADES- WET, NO HYDROCARBON ODOR.
	0.030 INCH SLOT	#3 SAND				X	9		
13						X	11		
						X	14		
14						X	6		
						X	7		
15						X	7		
						X	5		
16						X	5		
						X	7		
17						X	6		
						X	6		
18						X	7		
						X	7		
19						X	85		
							6		
20									

ANANIA GEOLOGIC ENGINEERING

BORING LOG

LOCATION OF BORING



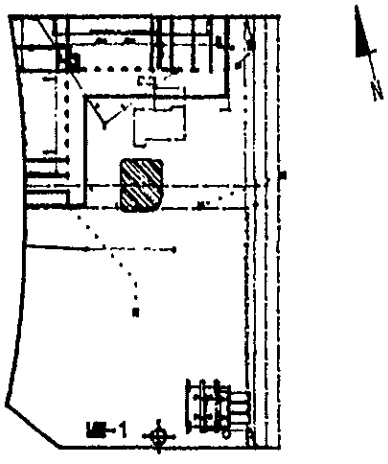
SITE/LOCATION	CARNATION/OAKLAND				BORING NO. MW-1
PROJECT NO.	004-88-059				SHEET 2 OF 3
WATER LEVEL ELEVATION	5.55	5.89	5.54	5.28	DRILLER
TIME					START: TIME 8:50; DATE 3-15-89
DATE	4-25-89	6-7-89	7-5-89	7-31-89	FINISH: TIME 11:50; DATE 3-15-89
CASING DEPTH ESTIMATED					
DRILLING CONTRACTOR	PC EXPLORATION				
DRILLER	MIKE MOORE				
DRILLING METHOD	HOLLOW STEM AUGER				
SAMPLING METHOD	140# HAMMER 30" DROP, MODIFIED CALIFORNIA SAMPLER				
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: M.A.M.			DATE 7-5-89		

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		SAND- GREEN-BROWN, WET, DENSE, MEDIUM TO COARSE GRAINED WITH
						X	19	SP	TRACE SILT, AREAS OF OXIDATION, QUARTZ, MAFICS, NO
21							20		HYDROCARBON ODOR.
						X	20	SM	
22						X	25		SILTY SAND- LIGHT BROWN, WET, DENSE, AREAS OF OXIDATION, QUARTZ,
						X	20		MAFICS, NO HYDROCARBON 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		
	0.030 INCH SLOT	#3 SAND				X	32		
29						X	33		
						X	33		
30						X	32	SP	SAND- BROWN, WET, VERY DENSE, MEDIUM GRAINED WITH SOME SILT,
						X	33		QUARTZ, MAFICS, NO HYDROCARBON ODOR.
31						X	30	SM	
						X	30		
32						X	33		
						X	35		SILTY SAND- LIGHT BROWN, WET, VERY DENSE, QUARTZ W/MAFICS,
33						X	30		NO HYDROCARBON ODOR.
						X	31		
34							32		
							28		
35						X	32		
						X	34		
36						X	29		
						X	22		
37						X	29		
						X	30		
38						X	30		
						X	31		
39						X	32		
40						X	30		NO HYDROCARBON ODOR.

ANANIA GEOLOGIC ENGINEERING

BORING LOG

LOCATION OF BORING



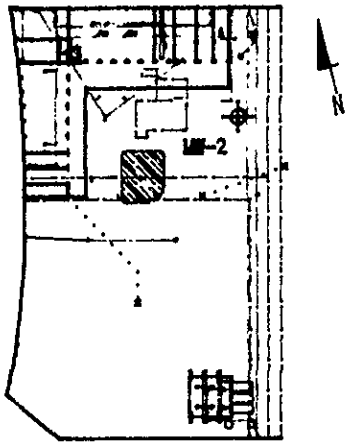
SITE/LOCATION	CARNATION/OAKLAND				BORING NO. MW-1
PROJECT NO.	004-88-059				
WATER LEVEL ELEVATION	5.55	5.89	5.54	5.28	SHEET 3 OF 3
TIME					DRILLER
DATE	4-25-89	6-7-89	7-5-89	7-31-89	START TIME 8:50 / FINISH TIME 11:50
CASING DEPTH ESTIMATED					
DRILLING CONTRACTOR	PC EXPLORATION				DATE 3-15-89 / DATE 3-15-89
DRILLER	MIKE MOORE				
DRILLING METHOD	HOLLOW STEM AUGER				
SAMPLING METHOD	140# HAMMER 30" DROP, MODIFIED CALIFORNIA SAMPLER				
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: M.A.M.		DATE	7-5-89		

DIST. FROM SURF.	WELL CONST. CASING	WELL CONST. ANNULUS	LEGEND	TLV READING	SAMPLE NO.	RECOVERY	BLOWS PER 6 IN.	USCS	LOG OF MATERIAL
41		#3 SAND				X	29	SM	
							33		
							31		
42						X	32		
						X	31		
43	0.030 INCH SLOT					X	31		
						X	28		
44						X	29		
							31		
							34		
45						X	27		
						X *	29		* SAMPLE COULD NOT BE RETAINED AFTER 4 ATTEMPTS WITH SAND
46						X	30		CATCHER.
						X	33		
47									
									TEST BORING TERMINATED @ 47' ON 3-15-89
									MATERIALS: 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				BORING NO. MW-2
PROJECT NO.	004-88-059				
WATER LEVEL ELEVATION	6.36	5.57	5.26		SHEET 1 OF 2
TIME					DRILLER
DATE	4-25-89	6-7-89	7-5-89	7-31-89	START: TIME 7:30, DATE 3-17-89 / FINISH: TIME 12:00, DATE 3-17-89
CASING DEPTH					

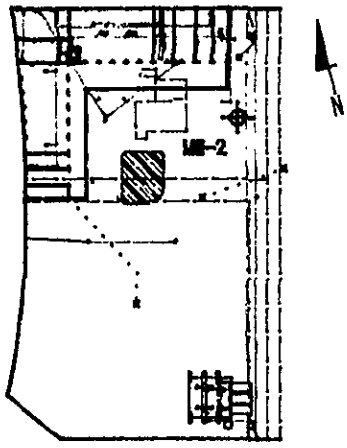
DRILLING CONTRACTOR: PC EXPLORATION
DRILLER: MIKE MOORE
DRILLING METHOD: HOLLOW STEM AUGER
SAMPLING METHOD: 140# HAMMER 30" DROP, MODIFIED CALIFORNIA SAMPLER
LOGGER: ERIC HOLM
N/S: N 2500.9 E/W: E 3233.9 ELEV.: 15.52
BORING DIAMETER: 10 INCHES WELL CASING DIAMETER: 4 INCHES
REVIEWED BY: M.A.M. DATE: 7-5-89

DIST. FROM SURF.	WELL CONST. CASING	WELL CONST. ANNULUS	LEGEND	TLV READING	SAMPLE NO.	RECOVERY	BLOWS PER 6 IN.	USCS	LOG OF MATERIAL
									ASPHALTIC CONCRETE
1								GP	SANDY GRAVEL- BROWN, MOIST, MEDIUM DENSE
2		4¢ BENTONITE CEMENT SLURRY		120		X	5	SM	SILTY SAND- GREENISH GRAY, DRY TO MOIST, SLIGHT HYDROCARBON ODOR
						X	5		WITH QUARTZ AND MAFICS, GRADES MEDIUM DENSE WITH VEINS
3						X	4		OF GRAY CLAY VEINS OF GRAY CLAY, ORGANICS (?) CENTER OF
						X	5		VEINS, CLAY VEINS ARE VERTICAL.
4	BLANK					X	5		
		3/8" BENT. PELL.		320	3838	X	6		
5						X	7		
						X	10		
6						X	11		COLOR CHANGE TO REDDISH BROWN, HYDROCARBON ODOR.
				140		X	14		
7						X	8		
						X	9		
8				190		X	9		
					3839	X	10		
9						X	11		
				70		X	12		
10						X	8		
						X	9		
11		#3 SAND		50		X	9		
						X	8		
12						X	8		GRADES WITH LENSES OF GRAY SAND; AREAS OF OXIDATION.
				50		X	7		
13	0.020 INCH SLOT					X	7		
						X	7		
14				150		X	7		REDDISH BROWN, NO HYDROCARBON ODOR.
						X	6		
15						X	7		
				20		X	8		
16						X	6		
						X	6		NO HYDROCARBON ODOR.
17				20		X	5		
						X	7		
18						X	8		
				25		X	9		
19						X	7		
						X	9		
20						X	9		

ANANIA GEOLOGIC ENGINEERING

BORING LOG

LOCATION OF BORING



SITE/LOCATION	CARNATION/OAKLAND				BORING NO. MW-2
PROJECT NO.	004-88-059				SHEET 2 OF 2
WATER LEVEL	6.36	5.57	5.26		DRILLER
TIME					START / FINISH
DATE	4-25-89	6-7-89	7-6-89	7-31-89	TIME 7:30 / TIME 12:00
CASING DEPTH					DATE 3-22-89 / DATE 3-22-89

DRILLING CONTRACTOR: PC EXPLORATION

DRILLER: MIKE MOORE

DRILLING METHOD: HOLLOW STEM AUGER

SAMPLING METHOD: 140# HAMMER 30" DROP, MODIFIED CALIFORNIA SAMPLER

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: M.A.M. | DATE: 7-10-89

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	SP	
	0.020 INCH SLOTS	#3 SAND		10		X	10		SAND- BROWN, WET, MEDIUM DENSE, MEDIUM GRAINED WITH AREAS OF
23						X	11		OXIDATION AND GRAY SAND NO ODOR.
						X	8		
24				12		X	8		
						X	9		
25								TD	TEST BORING ELIMINATED @ 25' ON 3-22-89

MATERIALS: 7 BAGS OF #3 SAND

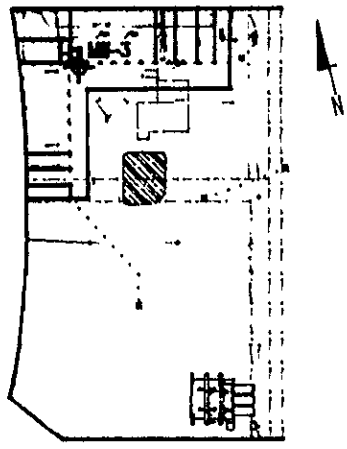
2 BAGS OF CEMENT

1-5 GALLON BUCKET OF BENTONITE

ANANIA GEOLOGIC ENGINEERING

BORING LOG

LOCATION OF BORING



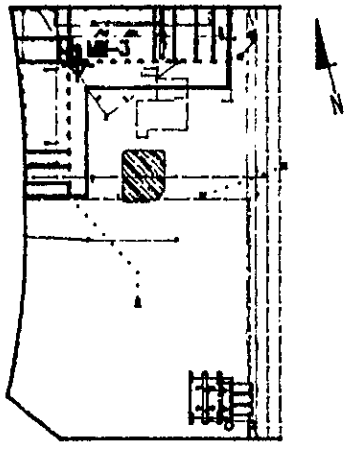
SITE/LOCATION	CARNATION/OAKLAND				BORING NO. MW-3
PROJECT NO.	004-88-059				
WATER LEVEL ELEVATION			4.22	4.75	SHEET 1 OF 2
TIME					DRILLER
DATE			7-5-89	7-31-89	START / FINISH
CASING DEPTH					TIME 1:15 / TIME 4:20
DRILLING CONTRACTOR	PC EXPLORATION				DATE 3-21-89 / DATE 3-21-89
DRILLER	MIKE MOORE				
DRILLING METHOD	HOLLOW STEM AUGER				
SAMPLING METHOD	140# HAMMER 30" DROP, MODIFIED CALIFORNIA SAMPLER				
LOGGER	ERIC HOLM				
N/S	N2813.2	E/W	E3114.7	ELEV.	14.66
BORING DIAMETER:	10 INCHES	WELL CASING DIAMETER:	4 INCHES		
REVIEWED BY:	M.A.M.	DATE:	7-10-89		

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

ANANIA GEOLOGIC ENGINEERING

BORING LOG

LOCATION OF BORING



SITE/LOCATION	CARNATION/OAKLAND				BORING NO. MW--3
PROJECT NO.	004-88-059				SHEET 2 OF 2
WATER LEVEL ELEVATION			4.22	4.75	DRILLER
TIME					START: TIME 1:15 / FINISH: TIME 4:20
DATE			7-5-89	7-31-89	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: 140# HAMMER 30" DROP, MODIFIED CALIFORNIA SAMPLER

LOGGER: ERIC HOLM

N/S: N 2813.2 | E/W: E 3114.7 | ELEV.: 14.66

BORING DIAMETER: 10 INCHES | BORING DIAMETER: 4 INCHES

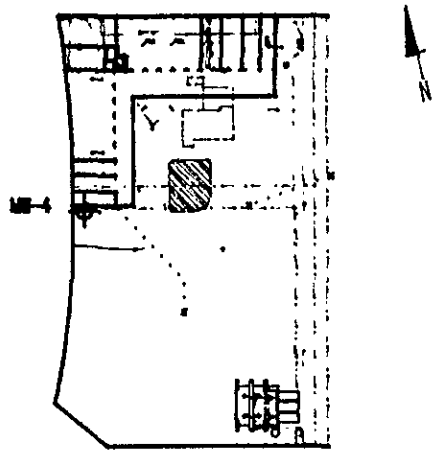
REVIEWED BY: M.A.M. | DATE: 7-10-89

DIST. FROM SURF.	WELL CONST. CASING	WELL CONST. ANNULUS	LEGEND	TLV READING	SAMPLE NO.	RECOVERY	BLOWS PER 6 IN.	USCS	LOG OF MATERIAL
21	0.020 INCH SLOT	#3 SAND						SM	
22									
23									
24						X	5		
25						X	5		
				4		X	6		WITH MINOR LAMINATIONS, MAFICS & QUARTZ, NO HYDROCARBON ODOR.
								TD	TEST BORING TERMINATED @ 25'
									MATERIALS: 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



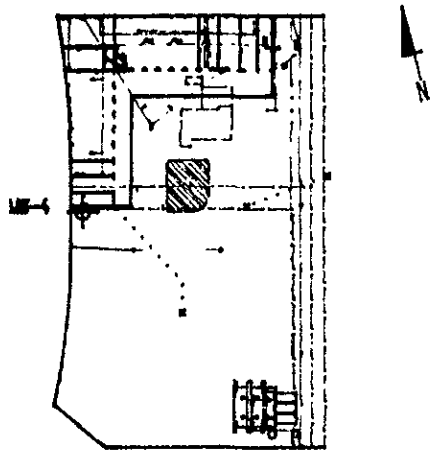
SITE/LOCATION	CARNATION/OAKLAND				BORING NO. MW-4
PROJECT NO.	004-88-059				
WATER LEVEL ELEVATION	6.29	5.57	5.37	4.92	SHEET 1 OF 3
TIME					DRILLER
DATE	4-25-89	6-7-89	7-5-89	7-31-89	START TIME 7:30 / FINISH TIME 4:20
CASING DEPTH ESTIMATED					
DRILLING CONTRACTOR	PC EXPLORATION				DATE 3-15-89 / DATE 3-15-89
DRILLER	MIKE MOORE				
DRILLING METHOD	HOLLOW STEM AUGER				
SAMPLING METHOD	140# HAMMER 30" DROP, MODIFIED CALIFORNIA SAMPLER				
LOGGER	ERIC HOLM				
N/S	N 2464.9	E/W	E 3023.1	ELEV.	14.84
BORING DIAMETER:	10 INCHES	WELL CASING DIAMETER:	4 INCHES		
REVIEWED BY:	M.A.M.	DATE:	6-15-89		

DIST. FROM SURF.	WELL CONST. CASING	WELL CONST. ANNULUS	LEGEND	TLV READING	SAMPLE NO.	RECOVERY	BLOWS PER 6 IN.	USCS	LOG OF MATERIAL
									ASPHALTIC CONCRETE
1		4" BENTONITE CEMENT SLURRY				X			SANDY GRAVEL- MOIST, MEDIUM DENSE WITH DEBRIS (CERAMIC PIPE PIECES)
						X	7		FILL.
2						X	8	GM	
						X	7		
3							8		
						X	8		
4	BLANK			25	3681	X	9	SM	
		3/8" BENT. PELLETS				X	7		SILTY SAND- RED BROWN, DRY TO MOIST, MEDIUM DENSE WITH ORGANICS,
5						X	8		QUARTZ, MAFICS, NO HYDROCARBON ODOR.
				21		X	9		
6						X	7		
					3685-	X	8		
7					3686	X	8		
				19	3687	X	8		
8							6		
						X	7		
9							8		
				19	3682	X	10		
10						X	10		
						X	7		
11						X	8	SM-	SILTY SAND/CLAYEY SAND- RED BROWN. MOIST, MEDIUM DENSE WITH QUARTZ,
				18	3688	X	8		MAFICS, NO HYDROCARBON ODOR.
12					3689	X	7	SC	
					3670	X	8		
13	0.030 INCH SLOT	#3 SAND		9		X	9		
						X	8		
14						X	7		
						X	9		
15				0		X	8	SM	SILTY SAND- MOTTLED RED BROWN TO GRAY, WET, MEDIUM DENSE, QUARTZ
						X	8		WITH MAFICS, NO HYDROCARBON ODOR.
16						X	8		
						X	7		SAND- RED BROWN, WET, MEDIUM GRAINED WITH SOME SILT AND AREAS OF
17				0		X	7		OXIDATION, QUARTZ, MAFICS, NO HYDROCARBON 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



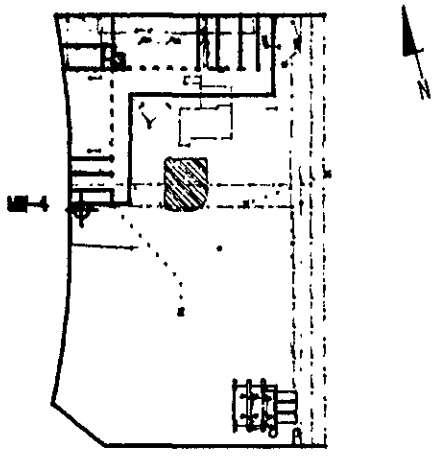
SITE/LOCATION	CARNATION/OAKLAND				BORING NO. MW-4
PROJECT NO.	004-68-069				
WATER LEVEL ELEVATION	6.29	5.57	5.37	4.92	SHEET 2 OF 3
TIME					DRILLER
DATE	4-25-89	6-7-89	7-5-89	7-31-89	START: TIME 7:30, DATE 3-20-89 / FINISH: TIME 4:20, DATE 3-20-89
CASING DEPTH ESTIMATED					
DRILLING CONTRACTOR	PC EXPLORATION				
DRILLER	MIKE MOORE				
DRILLING METHOD	HOLLOW STEM AUGER				
SAMPLING METHOD	140# HAMMER 30" DROP, MODIFIED CALIFORNIA SAMPLER				
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:	M.A.M.		DATE:		7-10-89

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

ANANIA GEOLOGIC ENGINEERING

BORING LOG

LOCATION OF BORING



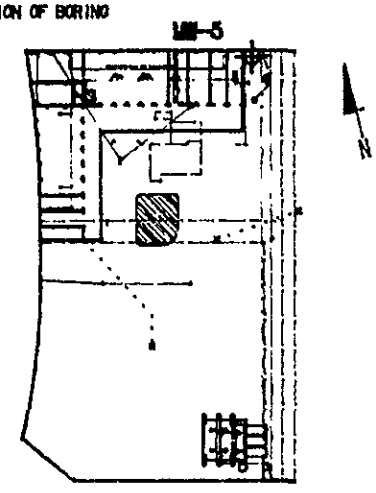
SITE/LOCATION	CARNATION/OAKLAND				BORING NO. MW-4
PROJECT NO.	004-88-059				SHEET 3 OF 3
WATER LEVEL ELEVATION	6.29	5.57	5.37	4.92	DRILLER
TIME					START: TIME 7:30 / FINISH: TIME 4:20
DATE	4-25-89	6-7-89	7-5-89	7-31-89	START: DATE 3-20-89 / FINISH: DATE 3-20-89
CASING DEPTH ESTIMATED					
DRILLING CONTRACTOR	PC EXPLORATION				
DRILLER	MIKE MOORE				
DRILLING METHOD	HOLLOW STEM AUGER				
SAMPLING METHOD	140# HAMMER 30" DROP, MODIFIED CALIFORNIA SAMPLER				
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:	M.A.M.		DATE:		7-10-89

DIST. FROM SURF.	WELL CONST. CASING	WELL CONST. ANNULUS	LEGEND	TLV READING	SAMPLE NO.	RECOVERY	BLOWS PER 6 IN.	USCS	LOG OF MATERIAL
				0		X	6		
						X	7		
41							5	SM	
	0.030 INCH SLOT	#3 SAND					7		
42				0		X	7		
						X	6		
43							8		
						X	6		SAND- RED BROWN, WET, MEDIUM DENSE, MEDIUM GRAINED WITH AREAS
44							7	SP	OF OXIDATION, QUARTZ, MAFICS, NO HYDROCARBON ODOR.
						X *	8		
45							6		
								TD	TEST BORING TERMINATED @ 45 1/2' ON 3-20-89
46									
									* SAMPLE COULD NOT BE RETAINED AFTER 4 ATTEMPTS WITH SAND
47									CATCHER.
48									MATERIALS: 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



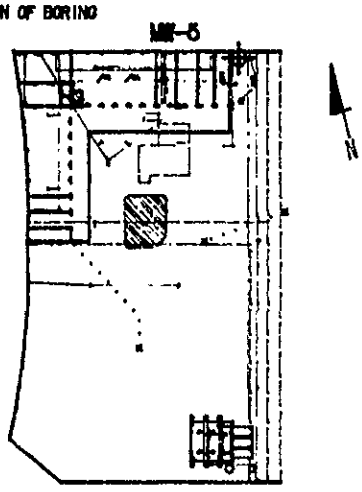
SITE/LOCATION	CARNATION/OAKLAND				BORING NO. MW-5
PROJECT NO.	004-68-059				
WATER LEVEL ELEVATION	6.16	5.41	5.06	4.82	SHEET 1 OF 2
TIME					DRILLER
DATE	4-25-89	6-7-89	7-6-89	7-31-89	START / FINISH
CASING DEPTH					TIME 7:45 / TIME 11:30
DRILLING CONTRACTOR	ENSCO SERVICES				DATE 3-21-89 / DATE 3-21-89
DRILLER	FRANK BARTOLVICH				
DRILLING METHOD	HOLLOW STEM AUGER				
SAMPLING METHOD	140# HAMMER 30" DROP, MODIFIED CALIFORNIA SAMPLER				
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:	M.A.M.		DATE:		8-17-89

DIST. FROM SURF.	WELL CONST. CASING	WELL CONST. ANNULUS	LEGEND	TLV READING	SAMPLE NO.	RECOVERY	BLOWS PER 6 IN.	USCS	LOG OF MATERIAL
									ASPHALTIC CONCRETE
1		4¢ BENTONITE CEMENT SLURRY						SM	SILTY SAND- GRAY GREEN, MOIST, LOOSE WITH LENSES OF FINE SAND WITH SILT, ANGULAR TO SUB-ANGULAR SAND GRAINS.
2									
3									
4	2" PVC BLANK	3/8" BENT. PELLET							
5									
6				0	3965		20		
							50		SANDY SILT- LIGHT YELLOW BROWN, MOIST TO WET, MEDIUM STIFF WITH TRACE CLAY.
7								ML	
8									
9							22		
				0			30		
10					3966		42		
11									
12									
13	0.030 INCH SLOT	3¢ SAND							
14									
15									
16							12	SM	SILTY SAND- MOTTLED LIGHT BROWN AND OLIVE, MOIST, LOOSE WITH SILT AND TRACE CLAY.
17				0			5		
							4		
18									
19									
20									

ANANIA GEOLOGIC ENGINEERING

BORING LOG

LOCATION OF BORING



SITE/LOCATION	CARNATION/OAKLAND				BORING NO. MW-5
PROJECT NO.	004-88-059				
WATER LEVEL ELEVATION	6.16	5.41	5.06	4.82	SHEET 2 OF 2
TIME					DRILLER
DATE	4-25-89	6-7-89	7-6-89	7-31-89	START: TIME 7:45, DATE 3-21-89 / FINISH: TIME 11:30, DATE 3-21-89
CASING DEPTH					

DRILLING CONTRACTOR: ENSCO SERVICES

DRILLER: FRANK BARTOLVICH

DRILLING METHOD: HOLLOW STEM AUGER

SAMPLING METHOD: 140# HAMMER 30" DROP, MODIFIED CALIFORNIA SAMPLER

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: M.A.M. DATE: 8-17-89

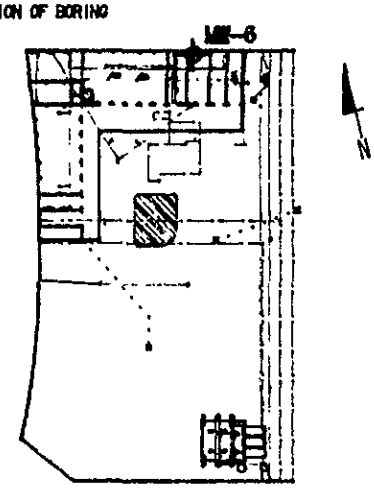
DIST. FROM SURF.	WELL CONST. CASING	WELL CONST. ANNULUS	LEGEND	TLV READING	SAMPLE NO.	RECOVERY	BLOWS PER 6 IN.	USCS	LOG OF MATERIAL
21		#3 SAND							
22	0.020 INCH SLOT							ML	SANDY SILT- BROWN, WET, STIFF WITH LENSES OF LIGHT BROWN SILT, CLAY AND FINE SAND.
23									
24									
25								TD	TEST BORING TERMINATED @ 25' ON 3-21-89

MATERIALS: 4 BAGS OF #3 SAND
1 BAG OF CEMENT
2/3-5 GALLON BUCKET OF BENTONITE

ANANIA GEOLOGIC ENGINEERING

BORING LOG

LOCATION OF BORING



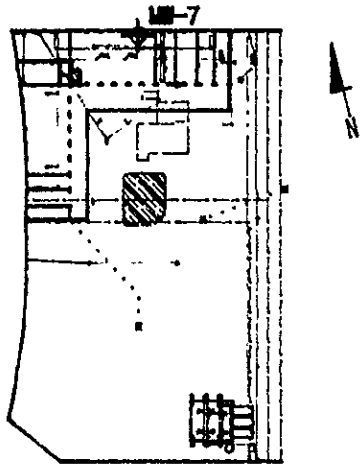
SITE/LOCATION	CARNATION/OAKLAND				BORING NO. MW-6
PROJECT NO.	004-88-059				
WATER LEVEL ELEVATION	6.07	****	****	4.89	SHEET 1 OF 1
TIME					DRILLER
DATE	4-25-89	6-7-89	7-6-89	7-31-89	START TIME 14:00 / FINISH TIME 14:30
CASING DEPTH					DATE 3-17-89 / DATE 3-17-89
DRILLING CONTRACTOR	ENSCO SERVICES				
DRILLER	J R				
DRILLING METHOD	HOLLOW STEM AUGER				
SAMPLING METHOD	140# HAMMER 30" DROP, MODIFIED CALIFORNIA SAMPLER				
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:	M.A.M.	DATE:	6-17-89		

DIST. FROM SURF.	WELL CONST. CASING	WELL CONST. ANNULUS	LEGEND	TLV READING	SAMPLE NO.	RECOVERY	BLOWS PER 6 IN.	USCS	LOG OF MATERIAL
									PORTLAND CEMENT CONCRETE
1									SAND- OLIVE, MOIST, LOOSE, VERY FINE GRAINED, ANGULAR TO SUB-ANGULAR
									GRAINS, OILY ODOR.
2		4x BENTONITE CEMENT SLURRY						SP	
3									
4	BLANK						6		SILTY SAND- OLIVE, MOIST, MEDIUM DENSE, FINE GRAINED WITH LITTLE
		3/8" BENT. PELLET						SM	
5					3164		11		SILT, SUB-ANGULAR TO SUB-ROUNDED SAND.
							19		3'10"- 4'2" : OILY ODOR.
6									CLAYEY SAND- BLACK, MOIST, MEDIUM DENSE WITH OILY ODOR.
7								SC	5'0" - APPROX. 8'0" : WITH OILY ODOR.
8									
								SP	SAND- OLIVE, VERY FINE TO FINE GRAINED, SUB-ANGULAR TO SUB-ROUNDED.
9							8	SM	TRACE SILT.
							11		
10					3165		18		SILTY SAND- MOTTLED LIGHT YELLOW BROWN AND OLIVE, WET, LOOSE WITH
11	0.020 INCH SLOT	#3 SAND							LITTLE SILT, SUB-ROUNDED TO ROUNDED SAND, LITTLE TO NO
									HYDROCARBON ODOR.
12									
13									
14									
15									
16					3166		3		LITTLE TO NO ODOR, OXIDIZED ZONES 1/4" X 1/64-1/32".
							5		
17							9		
									TEST BORING TERMINATED @ 17' ON 3-17-89
									MATERIALS: 4 BAGS OF #3 SAND
									1 BAG OF CEMENT
									2/3-5 GALLON BUCKET OF BENTONITE
									**** WATER LEVEL NOT MEASURED, WELL CONTAINED FREE PRODUCT.

ANANIA GEOLOGIC ENGINEERING

BORING LOG

LOCATION OF BORING



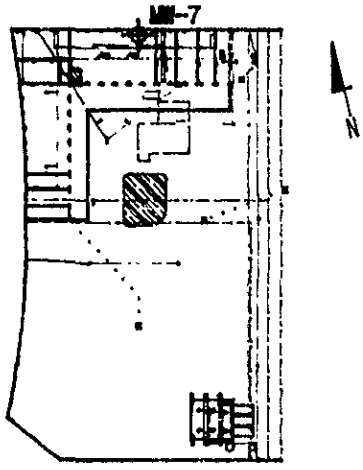
SITE/LOCATION	CARNATION/OAKLAND				BORING NO. MW-7
PROJECT NO.	004-68-069				
WATER LEVEL ELEVATION	****	****	****	****	SHEET 1 OF 2
TIME					DRILLER
DATE	4-25-89	6-7-89	7-6-89	7-31-89	START: TIME 13:00, DATE 3-16-89 / FINISH: TIME 13:50, DATE 3-16-89
CASING DEPTH					
DRILLING CONTRACTOR	ENSCO SERVICES				
DRILLER	J R				
DRILLING METHOD	HOLLOW STEM AUGER				
SAMPLING METHOD	140# HAMMER 30" DROP, MODIFIED CALIFORNIA SAMPLER				
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:	M.A.M.	DATE:	6-17-89		

DIST. FROM SURF.	WELL CONST. CASING	WELL CONST. ANNULUS	LEGEND	TLV READING	SAMPLE NO.	RECOVERY	BLOWS PER 6 IN.	USCS	LOG OF MATERIAL
									PORTLAND CONCRETE CEMENT
1		4# BENTONITE CEMENT SLURRY						SM	SILTY SAND- GRAY, MOIST, LOOSE TO MEDIUM DENSE, FINE GRAINED.
2									
3									
4	BLANK						4		
5		3/8" BENT. PELLET			3153	6	7		GRADES MEDIUM DENSE
						6	10		
6						6			
7									
8									
9						6	12		COLOR CHANGE TO YELLOW BROWN, SILT WITH LITTLE CLAY, SLIGHT GASOLINE
10		#3 SAND			3154	6	21		ODOR.
						6	30		
11	0.030 INCH SLOT								
12									
13									
14						N/R	4		CLAYEY SAND- LIGHT YELLOW BROWN, MOIST, LOOSE TO MEDIUM DENSE, FINE
15						N/R	5		GRAINED WITH SOME SILT.
						N/R	9	SC	
16					3155	6	4		
						6	5		
17						4	9		
18								SP	
19									SAND- YELLOW BROWN, WET, MEDIUM DENSE, FINE GRAINED WITH TRACE SILT.
20								SC	

ANANIA GEOLOGIC ENGINEERING

BORING LOG

LOCATION OF BORING



SITE/LOCATION	CARNATION/OAKLAND				BORING NO. MW-7
PROJECT NO.	004-88-059				
WATER LEVEL ELEVATION	****	****	****	****	SHEET 2 OF 2
TIME					DRILLER
DATE	4-25-89	6-7-89	7-5-89	7-31-89	START: TIME 13:00, DATE 3-16-89 / FINISH: TIME 13:50, DATE 3-16-89
CASING DEPTH					

DRILLING CONTRACTOR: ENSCO SERVICES

DRILLER: J R

DRILLING METHOD: HOLLOW STEM AUGER

SAMPLING METHOD: 140# HAMMER 30" DROP, MODIFIED CALIFORNIA SAMPLER

LOGGER: NICK COFFEE

N/S: N 2850.0 E/W: E 3199.2 ELEV.: 14.74

BORING DIAMETER: 6 INCHES WELL CASING DIAMETER: 2 INCHES

REVIEWED BY: M.A.M. DATE: 6-17-89

DIST. FROM SURF.	WELL CONST. CASING	WELL CONST. SCREEN	LEGEND	TLV READING	SAMPLE NO.	RECOVERY	BLOWS PER 6 IN.	USCS	LOG OF MATERIAL
								SC	CLAYEY SAND- YELLOW BROWN, WET, MEDIUM DENSE.
21					3156			SP	SAND- LIGHT YELLOW BROWN, WET, MEDIUM DENSE, FINE GRAINED WITH TRACE SILT.
22								TD	TEST BORING TERMINATED @ 22' ON 3-16-89

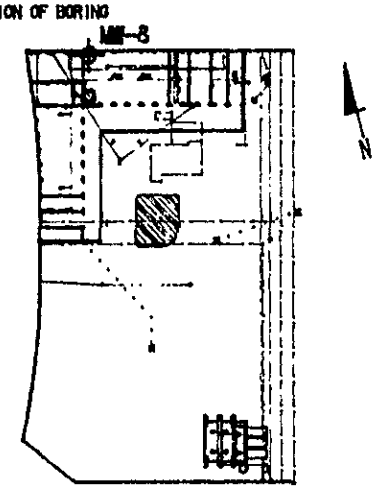
MATERIALS: 4 BAGS OF #3 SAND
1 BAG OF CEMENT
2/3-6 GALLON BUCKET OF BENTONITE

**** WATER LEVEL NOT MEASURED, WELL CONTAINED FREE PRODUCT.

ANANIA GEOLOGIC ENGINEERING

BORING LOG

LOCATION OF BORING



SITE/LOCATION	CARNATION/OAKLAND				BORING NO. MW-8
PROJECT NO.	004-88-059				
WATER LEVEL ELEVATION	****	****	****	****	SHEET 1 OF 1
TIME	14:30				DRILLER
DATE	3-17-89	4-25-89	6-7-89	7-5-89	START: TIME 13:40, DATE 3-17-89 / FINISH: TIME 14:10, DATE 3-17-89
CASING DEPTH	UNCASED				

DRILLING CONTRACTOR: ENSCO SERVICES
DRILLER: J R
DRILLING METHOD: HOLLOW STEM AUGER
SAMPLING METHOD: 140# HAMMER 30" DROP, MODIFIED CALIFORNIA SAMPLER
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: M.A.M. DATE: 6-17-89

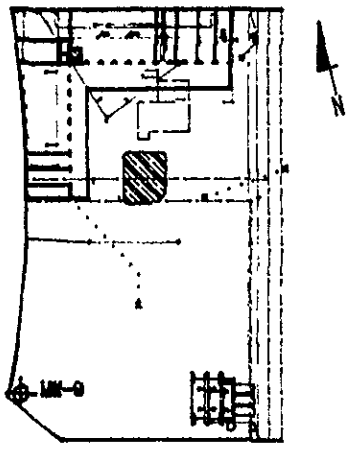
DIST. FROM SURF.	WELL CONST. CASING	WELL CONST. ANNULUS	LEGEND	TLV READING	SAMPLE NO.	RECOVERY	BLOWS PER 6 IN.	USCS	LOG OF MATERIAL
									PORTLAND CEMENT CONCRETE
1								ML	SANDY SILT DARK RED BROWN, MOIST, LOOSE WITH FINE ANGULAR TO SUB-ANGULAR SAND FRAGMENTS.
2		4¢ BENTONITE CEMENT SLURRY							
3								SC	CLAYEY SAND- GREEN-BROWN, MOIST, LOOSE WITH LITTLE SUB-ROUNDED GRAVELS TO 1 1/2" DIAMETER.
4	BLANK						4		SAND- OLIVE, MOIST, LOOSE, VERY FINE GRAINED.
5		3/8" BENT. PELLET			3161		5	SP	
6							7		
7								SC	CLAYEY SAND- LIGHT YELLOW BROWN, MOIST, MEDIUM DENSE, SUB-ANGULAR TO SUB-ROUNDED SAND.
8									
9							12		SILTY SAND- LIGHT YELLOW BROWN, MOIST, MEDIUM DENSE, SUB-ROUNDED SAND WITH TRACE CLAY, GASOLINE ODOR.
10		#3 SAND		10,000	3162		16		
11							23	SM	
12	0.030 INCH SLOT								
13									CLAYEY SAND- MOTTLED LIGHT YELLOW BROWN AND OLIVE, WET, LOOSE WITH SOME SILT, SLIGHT HYDROCARBON ODOR.
14								SC	
15									
16					3163		4		
17							5		
							6		TEST BORING TERMINATED @ 17' ON 3-17-89

**** WATER LEVEL NOT MEASURED, WELL CONTAINED FREE PRODUCT.

ANANIA GEOLOGIC ENGINEERING

BORING LOG

LOCATION OF BORING



SITE/LOCATION	CARNATION/OAKLAND				BORING NO. MW-9
PROJECT NO.	004-88-059				
WATER LEVEL ELEVATION	6.4	5.66			SHEET 1 OF 2
TIME					DRILLER
DATE	4-25-89	6-7-89	7-5-89	7-31-89	START: TIME 7:30, DATE 3-17-89
CASING DEPTH					FINISH: TIME 12:00, DATE 3-17-89

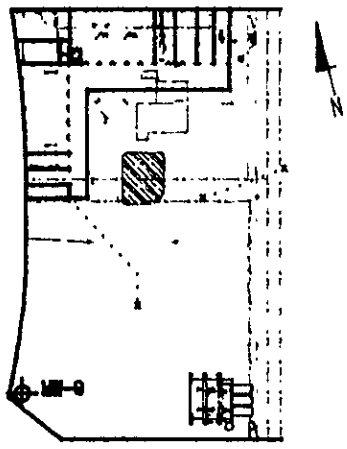
DRILLING CONTRACTOR: PC EXPLORATION
DRILLER: MIKE MOORE
DRILLING METHOD: HOLLOW STEM AUGER
SAMPLING METHOD: 140# HAMMER 30" DROP, MODIFIED CALIFORNIA SAMPLER
LOGGER: ERIC HOLM
N/S: N 2289.9 E/W: E 2956.1 ELEV.: 16.77
BORING DIAMETER: 10 INCHES WELL CASING DIAMETER: 4 INCHES
REVIEWED BY: M.A.M. DATE: 8-16-89

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

ANANIA GEOLOGIC ENGINEERING

BORING LOG

LOCATION OF BORING



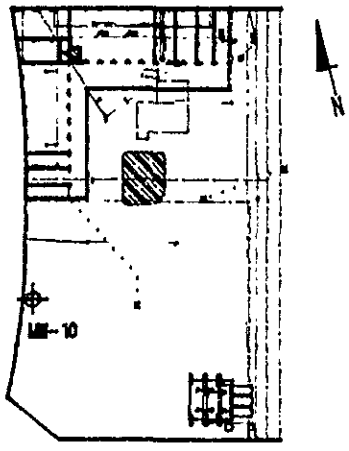
SITE/LOCATION	CARNATION/OAKLAND				BORING NO. MW-9
PROJECT NO.	004-88-059				
WATER LEVEL ELEVATION	6.4	5.88			SHEET 2 OF 2
TIME					DRILLER
DATE	4-25-89	6-7-89	7-5-89	7-31-89	START: TIME 7:30, DATE 3-17-89
CASING DEPTH					FINISH: TIME 12:00, DATE 3-17-89
DRILLING CONTRACTOR	PC EXPLORATION				
DRILLER	MIKE MOORE				
DRILLING METHOD	HOLLOW STEM AUGER				
SAMPLING METHOD	140# HAMMER 30" DROP, MODIFIED CALIFORNIA SAMPLER				
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:	M.A.M.	DATE:	6-16-89		

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	BLANK	#3 SAND						SP	
23									
24						X	7		
						X	9		NO HYDROCARBON ODOR.
25				0		X	9		
								TD	TEST BORING TERMINATED @ 25' ON 3-17-89
									MATERIALS: 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				
WATER LEVEL ELEVATION	6.41	5.89	5.23	5.08	SHEET 1 OF 2
TIME					DRILLER
DATE	4-25-89	6-7-89	7-5-89	7-31-89	START: TIME 1215, DATE 3-16-89 / FINISH: TIME 510, DATE 3-16-89
CASING DEPTH					

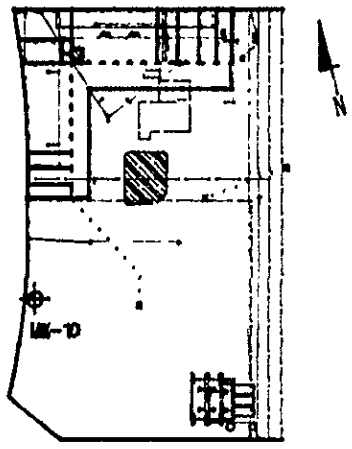
DRILLING CONTRACTOR: PC EXPLORATION
DRILLER: MIKE MOORE
DRILLING METHOD: HOLLOW STEM AUGER
SAMPLING METHOD: 140# HAMMER 30" DROP, MODIFIED CALIFORNIA SAMPLER
LOGGER: ERIC HOLM
N/S: N 2373.5 E/W: E 2933.6 ELEV.: 16.04
BORING DIAMETER: 10 INCHES WELL CASING DIAMETER: 4 INCHES
REVIEWED BY: M.A.M. DATE: 6-17-89

DIST. FROM SURF.	WELL CONST. CASING	WELL CONST. ANNULUS	LEGEND	TLV READING	SAMPLE NO.	RECOVERY	BLOWS PER 6 IN.	USCS	LOG OF MATERIAL
									ASPHALTIC CONCRETE
1		4# BENTONITE CEMENT SLURRY						GP	GRAVELY SAND- GRAY BROWN, DRY TO MOIST WITH MAFICS, GRAVEL ANGULAR 1/2" TO 1 1/2" QUARTZ, MEDIUM DENSE, SOME ORGANICS, NO HYDROCARBON ODOR, (FILL)
2									
3	BLANK								BRICK PIECES
4		3/8" BENT. PELL.				X	8		
						X	7		
5				0	3667	X	7	SM	SILTY SAND- LIGHT BROWN, MOIST, MEDIUM DENSE WITH SOME GRAVEL, QUARTZ, MAFICS, NO HYDROCARBON ODOR.
6									
7									
8									
9		#3 SAND				X	5	SP	
						X	6		SAND- SOME SILT, BROWN, MOIST, MEDIUM DENSE, WITH TRACE OF QUARTZ, MAFICS, LAMINATIONS-HORIZONTAL, NO HYDROCARBON ODOR.
10				0	3668	X	6		
11									
12									
13	0.020 INCH SLOT								
14						X	8	SM	SILTY SAND- GRAY AND BROWN, WET, MEDIUM DENSE, AREAS OF OXIDATION, QUARTZ, MAFICS, NO HYDROCARBON ODOR.
						X	8		
15				0		X	8		
16									
17									
18									
19						I	5		
						I	5		
20				0		X	7		NO HYDROCARBON ODOR.

ANANIA GEOLOGIC ENGINEERING

BORING LOG

LOCATION OF BORING



SITE/LOCATION	CARNATION/OAKLAND				BORING NO. MW--10
PROJECT NO.	004-88-059				
WATER LEVEL ELEVATION	6.41	5.89	5.23	5.06	SHEET 2 OF 2
TIME					DRILLER
DATE	4-25-89	6-7-89	7-6-89	7-31-89	START: TIME 1215; DATE 3-16-89 / FINISH: TIME 510; DATE 3-16-89
CASING DEPTH					

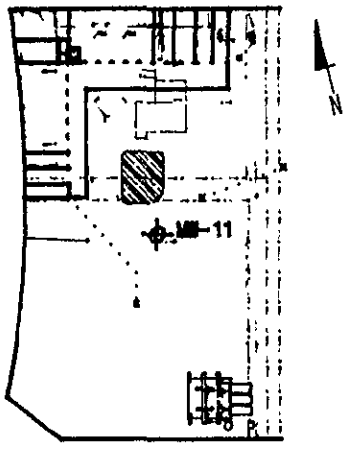
DRILLING CONTRACTOR: PC EXPLORATION
DRILLER: MIKE MOORE
DRILLING METHOD: HOLLOW STEM AUGER
SAMPLING METHOD: 140# HAMMER 30" DROP, MODIFIED CALIFORNIA SAMPLER
LOGGER: ERIC HOLM
N/S: N 2373.6 E/W: E 2983.6 ELEV.: 16.04
BORING DIAMETER: 10 INCHES WELL CASING DIAMETER: 4 INCHES
REVIEWED BY: M.A.M. DATE: 6-17-89

DIST. FROM SURF.	WELL CONST. CASING	WELL CONST. ANNULUS	LEGEND	TLV READING	SAMPLE NO.	RECOVERY	BLOWS PER 6 IN.	USCS	LOG OF MATERIAL
21								SM	
22	0.020 INCH SLOT	#3 SAND							
23									
24							7		
						X	8		
25				0		X	8		NO HYDROCARBON ODOR.
								TD	TEST BORING TERMINATED AT 25'
									MATERIALS: 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.	004-88-059				
WATER LEVEL ELEVATION	6.45	5.7	3.72	5.07	SHEET 1 OF 2
TIME					DRILLER
DATE	4-25-89	6-7-89	7-5-89	7-31-89	START: TIME 7:15, DATE 3-21-89 / FINISH: TIME 10:10, DATE 3-21-89
CASING DEPTH					

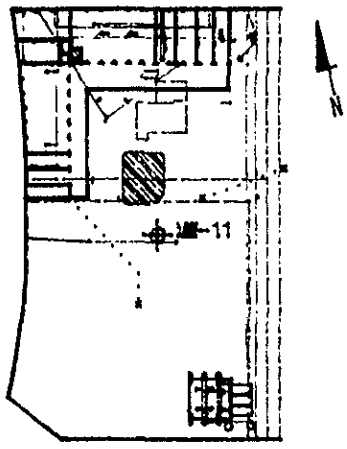
DRILLING CONTRACTOR: PC EXPLORATION
DRILLER: MIKE MOORE
DRILLING METHOD: HOLLOW STEM AUGER
SAMPLING METHOD: 140# HAMMER 30" DROP, MODIFIED CALIFORNIA SAMPLER
LOGGER: ERIC HOLM
N/S: N 2431.9 E/W: E 3127.6 ELEV.: 15.06
BORING DIAMETER: 10 INCHES CASING DIAMETER: 4 INCHES
REVIEWED BY: M.A.M. DATE: 8-17-89

DIST. FROM SURF.	WELL CONST. CASING	WELL CONST. ANNULUS	LEGEND	TLV READING	SAMPLE NO.	RECOVERY	BLOWS PER 6 IN.	USCS	LOG OF MATERIAL
									ASPHALTIC CONCRETE
1		4% BENTONITE CEMENT SLURRY						GM	SILTY GRAVEL- MOIST, MEDIUM DENSE.
2								SM	
3	BLANK								
4		3/8" BENT. PELL.					6		
5				3	3671		7		SILTY SAND- RED BROWN, MOIST, MEDIUM DENSE WITH QUARTZ, MAFICS, NO HYDROCARBON ODOR.
6				8			8		
7					3673		9		
8		#3 SAND			3674- 3675		11 6		
9				6	3672		7 8		GRADES WITH AREAS OF OXIDATION, MAFICS, QUARTZ, NO HYDROCARBON ODOR.
10							9		
11									
12									
13	0.030 INCH SLOT								
14							6 7		
15				11	3676	3	7		NO HYDROCARBON ODOR.
16					3677- 3678		8 7 7		
17									
18									
19							7		
20				4			7 8		NO HYDROCARBON ODOR.

ANANIA GEOLOGIC ENGINEERING

BORING LOG

LOCATION OF BORING



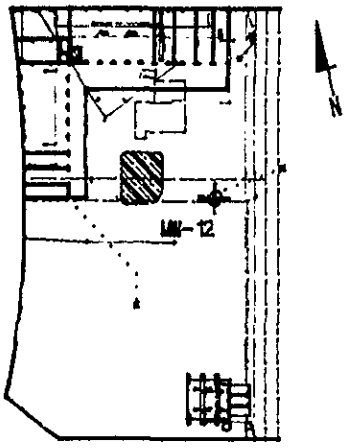
SITE/LOCATION	CARNATION/OAKLAND				BORING NO. MW-11
PROJECT NO.	004-88-059				
WATER LEVEL ELEVATION	6.45	5.7	3.72	5.07	SHEET 2 OF 2
TIME					DRILLER
DATE	4-25-89	6-7-89	7-6-89	7-31-89	START / FINISH
CASING DEPTH					TIME 7:15 / TIME 10:10
DRILLING CONTRACTOR	PC EXPLORATION				DATE 3-21-89 / DATE 3-21-89
DRILLER	MIKE MOORE				
DRILLING METHOD	HOLLOW STEM AUGER				
SAMPLING METHOD	140# HAMMER 30" DROP, MODIFIED CALIFORNIA SAMPLER				
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:	M.A.M.		DATE:		8-17-89

DIST. FROM SURF.	WELL CONST. CASING	WELL CONST. ANNULUS	LEGEND	TLV READING	SAMPLE NO.	RECOVERY	BLOWS PER 6 IN.	USCS	LOG OF MATERIAL
21	0.020 INCH SLOT	#3 SAND						SM	
22									
23									
24							7		
25				0			7		NO HYDROCARBON ODOR.
							7		
								TD	TEST BORING TERMINATED @ 25'
									MATERIALS: 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.	004-88-069				
WATER LEVEL ELEVATION	6.45	5.86	5.28	5.14	SHEET 1 OF 2
TIME					DRILLER
DATE	4-25-89	5-7-89	7-5-89	7-31-89	START: TIME 10:10, DATE 3-21-89 / FINISH: TIME 1:00, DATE 3-21-89
CASING DEPTH					

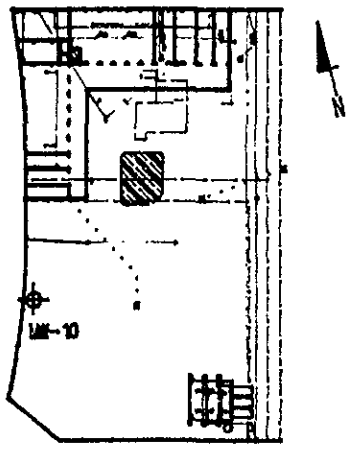
DRILLING CONTRACTOR: PC EXPLORATION
DRILLER: MIKE MOORE
DRILLING METHOD: HOLLOW STEM AUGER
SAMPLING METHOD: 140# HAMMER 30" DROP, MODIFIED CALIFORNIA SAMPLER
LOGGER: ERIC HOLM
N/S: N 2450.8 E/W: E 3230.8 ELEV.: 15.70
BORING DIAMETER: 10 INCHES WELL CASING DIAMETER: 4 INCHES
REVIEWED BY: M.A.M. DATE: 8-17-89

DIST. FROM SURF.	WELL CONST. CASING	WELL CONST. ANNULUS	LEGEND	TLV READING	SAMPLE NO.	RECOVERY	BLOWS PER 6 IN.	USCS	LOG OF MATERIAL
									ASPHALTIC CONCRETE
1		4% BENTONITE CEMENT SLURRY						GM	SILTY GRAVEL- MOIST MEDIUM DENSE.
2									
3	BLANK								
4						X	5		
		3/8" BENT. PELL.				X	5		
5				11	3679	X	5		SILTY SAND- RED BROWN, MOIST, LOOSE WITH AREAS OF OXIDATION, QUARTZ, MAFICS, NO HYDROCARBON ODOR.
6		#3 SAND				X	6		
						X	7		
7						X	9		NO HYDROCARBON ODOR.
8									
						X	8		
						X	8		
9				9	3680	X	9	SM	NO HYDROCARBON ODOR.
10									
11									
12									
13	0.020 INCH SLOT								
14							7		
						X	8		
15				16		X	8		GRADES, WET, NO HYDROCARBON ODOR.
16									
17									
18									
19						*	8	SP	* NO SAMPLE RECOVERED.
							9		
20							9		

ANANIA GEOLOGIC ENGINEERING

BORING LOG

LOCATION OF BORING



SITE/LOCATION	CARNATION/OAKLAND				BORING NO. MW-12
PROJECT NO.	004-88-059				
WATER LEVEL ELEVATION	6.45	5.7	3.72	5.07	SHEET 2 OF 2
TIME					DRILLER
DATE	4-25-89	6-7-89	7-6-89	7-31-89	START: TIME 1010, DATE 3-21-89 / FINISH: TIME 1300, DATE 3-21-89
CASING DEPTH					

DRILLING CONTRACTOR: PC EXPLORATION

DRILLER: MIKE MOORE

DRILLING METHOD: HOLLOW STEM AUGER

SAMPLING METHOD: 140# HAMMER 30" DROP, MODIFIED CALIFORNIA SAMPLER

LOGGER: ERIC HOLM

N/S: N 2460.8 E/W: E 3230.5 ELEV.: 16.70

BORING DIAMETER: 10 INCHES WELL CASING DIAMETER: 4 INCHES

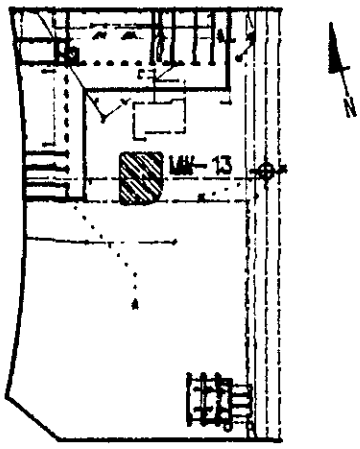
REVIEWED BY: M.A.M. DATE: 8-17-89

DIST. FROM SURF.	WELL CONST. CASING	WELL CONST. SCREEN	LEGEND	TLV READING	SAMPLE NO.	RECOVERY	BLOWS PER 6 IN.	USCS	LOG OF MATERIAL
21								SM	
22									
23	0.020 INCH SLOT	#3 SAND							
						X	8	SP	SANDY- GRAY BROWN, WET, MEDIUM DENSE, QUARTZ, NO HYDROCARBON ODOR.
24						X	9		
25				7		X	9		
								TD	TEST BORING TERMINATED AT 25'
									MATERIALS: 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.	004-88-059				
WATER LEVEL ELEVATION	6.38	5.81	5.3	5.02	SHEET 1 OF 2
TIME					DRILLER
DATE	4-25-89	6-7-89	7-6-89	7-31-89	START: TIME 11:45, DATE 3-21-89 / FINISH: TIME 15:50, DATE 3-21-89
CASING DEPTH					

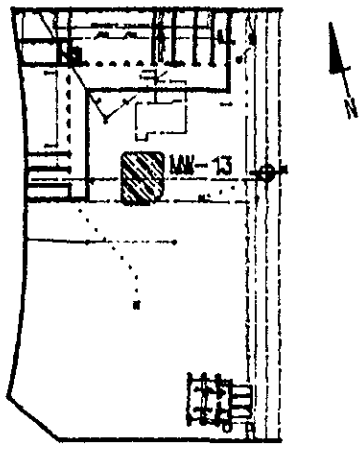
DRILLING CONTRACTOR: ENSCO SERVICES
DRILLER: FRANK BARTOLVICH
DRILLING METHOD: HOLLOW STEM AUGER
SAMPLING METHOD: 140# HAMMER 30" DROP, MODIFIED CALIFORNIA SAMPLER
LOGGER: KARL ANANIA
N/S: N 2489.7 E/W: E 3290.0 ELEV.: 15.48
BORING DIAMETER: 10 INCHES WELL CASING DIAMETER: 4 INCHES
REVIEWED BY: M.A.M. DATE: 6-17-89

DIST. FROM SURF.	WELL CONST. CASING	WELL CONST. ANNULUS	LEGEND	TLV READING	SAMPLE NO.	RECOVERY	BLOWS PER 6 IN.	USCS	LOG OF MATERIAL
									ASPHALTIC CONCRETE
1									AGGREGATE BASEROCK
									ASPHALTIC CONCRETE
2		4" BENTONITE CEMENT SLURRY							AGGREGATE BASEROCK
									ASPHALTIC CONCRETE
3								GM	SILTY GRAVEL- GRAY, MOIST, MEDIUM DENSE.
	2" PVC BLANK								
4		3/8" BENT. PELLET						SC	SILTY SAND- MOTTLED YELLOW BROWN TO DARK BROWN, MOIST TO WET,
5									MEDIUM DENSE, FINE GRAINED WITH TRACE OF CLAY.
							6		
6				0	3869		7		
							8		
7									
8							24		GRADES DENSE
				0	3970		28		
9							40		
10									
11									
12		3/8" SAND							
13	0.030 INCH SLOT								
14									
15							6		
				0			7		
16							13		
17									
18									SANDY SILT- BROWN TO LIGHT BROWN, WET, STIFF, FINE
									GRAINED.
19								ML	

ANANIA GEOLOGIC ENGINEERING

BORING LOG

LOCATION OF BORING



SITE/LOCATION	CARNATION/OAKLAND				BORING NO. MW-13
PROJECT NO.	004-88-069				
WATER LEVEL ELEVATION	6.38	5.61	5.3	5.02	SHEET 2 OF 2
TIME					DRILLER
DATE	4-25-89	6-7-89	7-5-89	7-31-89	START: TIME 11:45, DATE 3-21-89 / FINISH: TIME 15:50, DATE 3-21-89
CASING DEPTH					

DRILLING CONTRACTOR: ENSCO SERVICES
DRILLER: FRANK BARTOLVICH
DRILLING METHOD: HOLLOW STEM AUGER
SAMPLING METHOD: 140# HAMMER 30" DROP, MODIFIED CALIFORNIA SAMPLER
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: M.A.M. DATE: 8-17-89

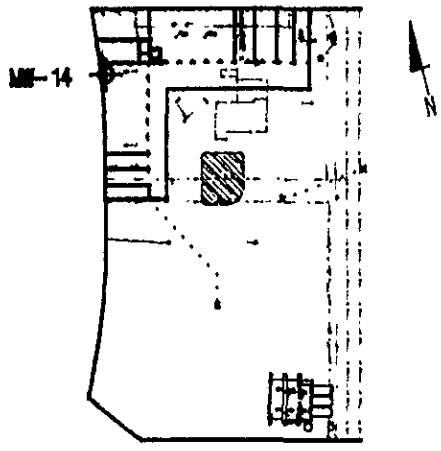
DIST. FROM SURF.	WELL CONST. CASING	WELL CONST. SLOTTED	LEGEND	TLV READING	SAMPLE NO.	RECOVERY	BLOWS PER 6 IN.	USCS	LOG OF MATERIAL
21		#3 SAND					32		
							50		
22								ML	
23									
24									
25								TD	TEST BORING TERMINATED @ 25'

MATERIALS: 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				
WATER LEVEL ELEVATION		5.36	4.82	4.68	SHEET 1 OF 2
TIME					DRILLER
DATE	4-25-89	6-7-89	7-5-89	7-31-89	START: TIME 07:50, DATE 3-17-89 / FINISH: TIME 08:30, DATE 3-17-89
CASING DEPTH					

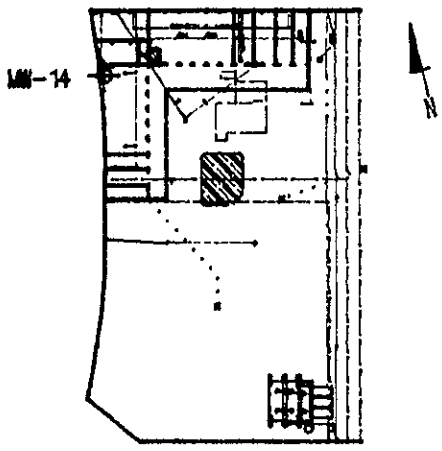
DRILLING CONTRACTOR: ENSCO SERVICES
DRILLER: J R
DRILLING METHOD: HOLLOW STEM AUGER
SAMPLING METHOD: 140# HAMMER 30" DROP, MODIFIED CALIFORNIA SAMPLER
LOGGER: NICK COFFEE
N/S: N 2619.1 E/W: E 3055.0 ELEV.: 14.80
BORING DIAMETER: 6 INCHES WELL CASING DIAMETER: 2 INCHES
REVIEWED BY: M.A.M. DATE: 8-16-89

DIST. FROM SURF.	WELL CONST. CASING	WELL CONST. ANNULUS	LEGEND	TLV READING	SAMPLE NO.	RECOVERY	BLOWS PER 6 IN.	USCS	LOG OF MATERIAL
									PORTLAND CEMENT CONCRETE
1		4" BENTONITE CEMENT SLURRY						SC	CLAYEY SAND- GRAY, MOIST, LOOSE, FINE TO MEDIUM GRAINED.
2									
3									
4	BLANK					0	4		COLOR CHANGE TO YELLOW BROWN WITH INCREASING CLAY CONTENT.
5		3/8" BENT. PELLET			3149	6	5		
6						6	8		
7									
8									
9						4	16		SAND- MOTTLED RED BROWN TO GRAY, MOTTLING IN 1/4"-1/2" OVALS,
10					3150	6	25	SP	MOIST, DENSE, FINE TO MEDIUM SAND WITH TRACE CLAY.
11						6	35		
12									
13	0.030 INCH SLOT	#3 SAND				0	10		
14					3151	6	12		SILTY SAND- MOTTLED RED BROWN, WET MEDIUM DENSE, FINE TO
15						6	14	SM-ML	COARSE GRAINED WITH TRACE CLAY.
16									
17									
18									
19								SP	SAND- RED BROWN WITH GRAY INCLUSIONS (OVAL UP TO 2" IN DIAMETER)
20									WET, VERY DENSE WIYH TRACE SILT AND CLAY.

ANANIA GEOLOGIC ENGINEERING

BORING LOG

LOCATION OF BORING



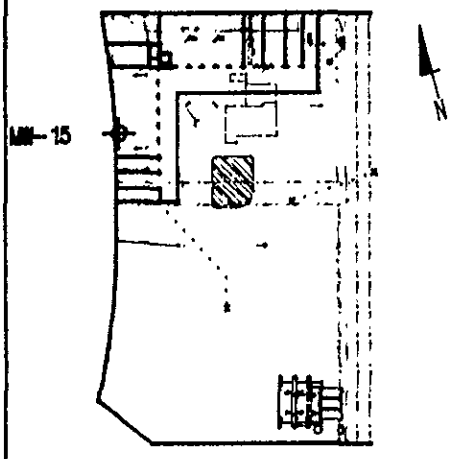
SITE/LOCATION	CARNATION/OAKLAND				BORING NO. MW-14
PROJECT NO.	004-88-059				
WATER LEVEL ELEVATION		5.36	4.82	4.68	SHEET 2 OF 2
TIME					DRILLER
DATE	4-25-89	6-7-89	7-5-89	7-31-89	START: TIME 07:50, DATE 3-17-89 / FINISH: TIME 08:30, DATE 3-17-89
CASING DEPTH					
DRILLING CONTRACTOR	ENSCO SERVICES				
DRILLER	J R				
DRILLING METHOD	HOLLOW STEM AUGER				
SAMPLING METHOD	140# HAMMER 30" DROP, MODIFIED CALIFORNIA SAMPLER				
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:	M.A.M.	DATE:	6-16-89		

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					3182		45		MEDIUM, SUB-ROUNDED SAND WITH UP TO 5% SILT + CLAY, WET.
							50/5		
22								TD	TEST BORING TERMINATED @ 22'
									MATERIALS: 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-15
PROJECT NO.	004-88-059				
WATER LEVEL ELEVATION	6.13	5.44	5.09	4.73	SHEET 1 OF 2
TIME					DRILLER
DATE	4-25-89	6-7-89	7-6-89	7-31-89	START: 09:00 3-17-89 / FINISH: 10:00 3-17-89
CASING DEPTH					

DRILLING CONTRACTOR: ENSCO SERVICES

DRILLER: J R

DRILLING METHOD: HOLLOW STEM AUGER

SAMPLING METHOD: 140# HAMMER 30" DROP, MODIFIED CALIFORNIA SAMPLER

LOGGER: NICK COFFEE

N/S: N 2565.3 E/W: E 3041.5 ELEV.: 14.82

BORING DIAMETER: 8 INCHES WELL CASING DIAMETER: 2 INCHES

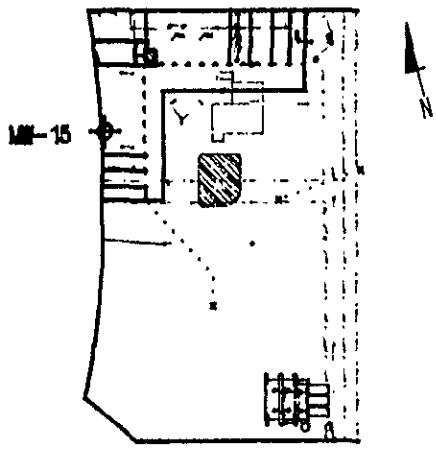
REVIEWED BY: M.A.M. DATE: 8-17-89

DIST. FROM SURF.	WELL CONST. CASING	WELL CONST. ANNULUS	LEGEND	TLV READING	SAMPLE NO.	RECOVERY	BLOWS PER 6 IN.	USCS	LOG OF MATERIAL
									PORTLAND CEMENT CONCRETE
1		4¼ BENTONITE CEMENT SLURRY						ML	SANDY SILT- DARK RED BROWN, MOIST, SOFT, VERY FINE GRAINED WITH SUBANGULAR SAND.
2									
3									
4	BLANK	3/8" BENT. PELLET				6	6	CL	CLAY- GREY, SOFT, MOIST WITH TRACE SILT.
5					3157	6	11	SP	SAND- YELLOW BROWN, DRY, LOOSE TO MEDIUM DENSE, FINE GRAINED
						6	12		ANGULAR TO SUB-ANGULAR.
6									
7									COLOR CHANGE TO RED-BROWN.
8									GRADES WITH INCREASING CLAY CONTENT.
									GRADING TO CLAYEY SAND, 10-20% CLAY.
9									
10									
11						6	11		COLOR CHANGE TO MOTTLED YELLOW BROWN AND LIGHT OLIVE WITH SOME
12	0.020 INCH SLOT	¾ SAND			3158	6	21		INTERBEDDED SILTY SAND AND CLAYEY SAND LAYERS 4" TO 6" IN THICKNESS.
					3159	6	17		
13									
14									
15									
16									
17									
18									
19							13		GRADES, WET, VERY DENSE.
20							21		

ANANIA GEOLOGIC ENGINEERING

BORING LOG

LOCATION OF BORING



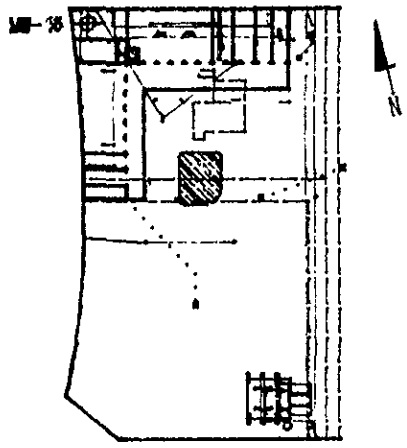
SITE/LOCATION	CARNATION/OAKLAND				BORING NO. MW-15
PROJECT NO.	004-68-059				
WATER LEVEL ELEVATION	6.13	5.44	5.09	4.73	SHEET 2 OF 2
TIME					DRILLER
DATE	4-25-89	6-7-89	7-5-89	7-31-89	START: TIME 09:00, DATE 3-17-89
CASING DEPTH					FINISH: TIME 10:00, DATE 3-17-89
DRILLING CONTRACTOR	ENSCO SERVICES				
DRILLER	J R				
DRILLING METHOD	HOLLOW STEM AUGER				
SAMPLING METHOD	140# HAMMER 30" DROP, MODIFIED CALIFORNIA SAMPLER				
LOGGER	NICK COFFEE				
N/S	N 2566.3	E/W	E 3041.5	ELEV.	14.82
BORING DIAMETER:	8 INCHES	WELL CASING DIAMETER:	2 INCHES		
REVIEWED BY:	M.A.M.	DATE:	8-17-89		

DIST. FROM SURF.	WELL CONST. CASING	WELL CONST. ANNULUS	LEGEND	TLV READING	SAMPLE NO.	RECOVERY	BLOWS PER 6 IN.	USCS	LOG OF MATERIAL
					3160		50/5		WITH INTERBEDDED SILTY SAND INTERBEDDING.
21		#3 SAND							
									SUB-ROUNDED TO SUB-ANGULAR GRAINS.
22								TD	TEST BORING TERMINATED @ 22' ON 3-17-89
									MATERIALS: 4 BAGS OF #3 SAND
									1 BAG OF CEMENT
									2/3-5 GALLON BUCKET OF BENTONITE

ANANIA GEOLOGIC ENGINEERING

BORING LOG

LOCATION OF BORING



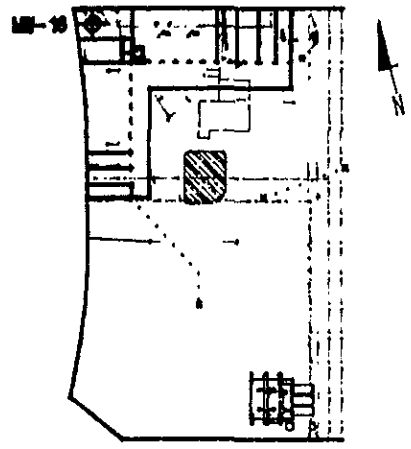
SITE/LOCATION	CARNATION/OAKLAND				BORING NO. MW-16
PROJECT NO.	004-88-069				SHEET 1 OF 2
WATER LEVEL ELEVATION	5.89	5.21	4.83	4.59	DRILLER
TIME					START / FINISH
DATE	4-25-89	6-7-89	7-5-89	7-31-89	TIME 13:20 / TIME 16:20
CASING DEPTH					DATE 3-22-89 / DATE 3-22-89
DRILLING CONTRACTOR	ENSCO SERVICES				
DRILLER	FRANK BARTOLVICH				
DRILLING METHOD	HOLLOW STEM AUGER				
SAMPLING METHOD	140# HAMMER 30" DROP, MODIFIED CALIFORNIA SAMPLER				
LOGGER	KARL ANANIA				
N/S	N 2689.0	E/W	E 3067.8	ELEV.	14.76
BORING DIAMETER:	6 INCHES		WELL CASING DIAMETER:		2 INCHES
REVIEWED BY:	M.A.M.		DATE:		6-17-89

DIST. FROM SURF.	WELL CONST. CASING	WELL CONST. ANNULUS	LEGEND	TLV READING	SAMPLE NO.	RECOVERY	BLOWS PER 6 IN.	USCS	LOG OF MATERIAL
									ASPHALTIC CONCRETE
1		4% BENTONITE CEMENT SLURRY						SC	CLAYEY SAND- DARK BROWN TO BLACK BASE, MOIST, (FILL).
2									
3	2" PVC BLANK							ML	SANDY SILT- LIGHT BROWN, DRY TO MOIST, SOFT, NO HYDROCARBON ODOR.
4		3/8" BENT. PELL.							
5							6		GRADES, MEDIUM STIFF
6		#3 SAND		0	3973		12		
7							21		
8									
9									
10							9		
11	0.020 INCH SLOT			0	3974		11		COLOR CHANGE TO LIGHT BROWN, VERY WET, GRADES.
12							21		
13									
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 ELEVATION	5.89	5.21	4.83	4.59	DRILLER
TIME					START: TIME 13:20; DATE 3-22-89
DATE	4-25-89	6-7-89	7-5-89	7-31-89	FINISH: TIME 16:20; DATE 3-22-89
CASING DEPTH					
DRILLING CONTRACTOR	ENSCO SERVICES				
DRILLER	FRANK BARTOLVICH				
DRILLING METHOD	HOLLOW STEM AUGER				
SAMPLING METHOD	140# HAMMER 30" DROP, MODIFIED CALIFORNIA SAMPLER				
LOGGER	KARL ANANIA				
N/S	N 2669.0	E/W	E 3087.6	ELEV.	14.78
BORING DIAMETER:	6 INCHES	WELL CASING DIAMETER:	2 INCHES		
REVIEWED BY:	M.A.M.	DATE:	8-16-89		

DIST. FROM SURF.	WELL CONST. CASING	WELL CONST. ANNULUS	LEGEND	TLV READING	SAMPLE NO.	RECOVERY	BLOWS PER 6 IN.	USCS	LOG OF MATERIAL
21									GRADES WITH CLAY, SOFT.
22	0.030 INCH SLOT	#3 SAND							
23									
24									
25								TD	TEST BORING TERMINATED @ 25' ON 3-22-89
									MATERIALS: 4 BAGS OF #3 SAND
									1 BAG OF CEMENT
									2/3-5 GALLON BUCKET OF BENTONITE

APPENDIX E

Analytical Results of Soil samples (PR-71 through PR-73)

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: 05/19/89
Analyzed: 05/30/89
Reported: 06/21/89
Job No #: 70842

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
Lead analysis: By EPA 6010
mg/kg

Lab ID	Client ID	Gasoline	Diesel	Total Lead	Soluble Lead
70842-1	#4137 (PR-71)	100	74	1.6	0.38
70842-2	#4138 (PR-71)	ND<10	ND<10	1.8	0.16
70842-3	#4139 (PR-71)	320	50	ND<1.1	0.17
70842-4	#4145 (PR-72)	ND<10	ND<10	2.1	0.56
70842-5	#4146 (PR-72)	1021	140	9.7	2.6
70842-6	#4147 (PR-72)	ND<10	ND<10	1.3	0.38
70842-7	#4141 (PR-73)	ND<10	ND<10	3.1	0.16
70842-8	#4142 (PR-73)	ND<10	ND<10	1.2	0.18
70842-9	#4143 (PR-73)	ND<10	ND<10	4.2	0.44

Extracted: 05/30/89

QA/QC: Spike Recovery for Diesel: 112%
Spike Recovery for Gasoline: 105%
Spike Recovery for Lead: 84%

Detection Limit for Diesel: 10
Detection Limit for Gasoline: 10
Detection Limit for Total Lead: 1.1
Detection Limit for Soluble 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: 05/19/89
Analyzed: 06/20/89
Reported: 06/21/89
Job No #: 70842

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

Project: #004-88-059

Aromatic Volatile Hydrocarbon Analysis:
EPA Method 8020
mg/kg

Lab ID	Client ID	Benzene	Toluene	MDL
70842-1	#4137 (PR-71)	1.0	1.6	0.03
70842-2	#4138 (PR-71)	0.10	0.10	0.03
70842-3	#4139 (PR-71)	9.0	28	0.03
70842-4	#4145 (PR-72)	0.03	ND<0.03	0.03
70842-5	#4146 (PR-72)	137	450	0.03
70842-6	#4147 (PR-72)	0.92	0.33	0.03
70842-7	#4141 (PR-73)	ND<0.03	ND<0.03	0.03
70842-8	#4142 (PR-73)	ND<0.03	ND<0.03	0.03
70842-9	#4143 (PR-73)	ND<0.03	ND<0.03	0.03

Lab ID	Client ID	Ethylbenzene	Xylene	MDL
70842-1	#4137 (PR-71)	1.20	10	0.03
70842-2	#4138 (PR-71)	ND<0.03	0.16	0.03
70842-3	#4139 (PR-71)	6.7	50	0.03
70842-4	#4145 (PR-72)	ND<0.03	0.15	0.03
70842-5	#4146 (PR-72)	110	870	0.03
70842-6	#4147 (PR-72)	0.08	0.44	0.03
70842-7	#4141 (PR-73)	ND<0.03	0.04	0.03
70842-8	#4142 (PR-73)	ND<0.03	0.03	0.03
70842-9	#4143 (PR-73)	ND<0.03	0.04	0.03

Extracted: 05/22/89
QA/QC: Spike Recovery for BTX Average: 103%

Jaime Chow
Laboratory Director

ANANIA GEOLOGIC ENGINEERING

AGE

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

LAB LOG NO.	DATE	TIME	SAMPLE I.D.	NO. OF CONTAINERS	SAMPLE TYPE: SOIL COMP	SOIL GRAB	WATER	TPH Mod. 8015	BTEX 8020	TTLC total lead	STLC soluble lead				REMARKS
	5/18/89		4137 (PR-71)	1		X		X	X	X	X				
	5/18/89		4138 (PR-71)	1		X		X	X	X	X				
	5/18/89		4139 (PR-71)	1		X		X	X	X	X				
	5/19/89		4145 (PR-72)	1		X		X	X	X	X				
	5/19/89		4146 (PR-72)	1		X		X	X	X	X				
	5/19/89		4147 (PR-72)	1		X		X	X	X	X				
	5/19/89		4141 (PR-73)	1		X		X	X	X	X				
	5/19/89		4142 (PR-73)	1		X		X	X	X	X				
	5/19/89		4143 (PR-73)	1		X		X	X	X	X				

RELINQUISHED BY: (signature)	DATE/TIME	RECEIVED BY: (signature)
John L Russell	5/19/89 1:35p	Raj Pandher
RELINQUISHED BY: (signature)	DATE/TIME	RECEIVED BY: (signature)
RELINQUISHED BY: (signature)	DATE/TIME	RECEIVED BY: (signature)

REMARKS:
standard turnaround time

SEND RESULTS TO:
ATTN: Mary Scruggs
AGE
11330 Sunrise Park Dr., Suite C
Rancho Cordova, CA 95742
PHONE NO. (916) 851-8021

CHAIN OF CUSTODY

631-0154

White - AGE Yellow - LAB Copy Pink - File

APPENDIX F

Analytical results of Groundwater Samples Collected April 27, 1989 and June 7, 1989

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

CERTIFICATE OF ANALYSIS

RECEIVED MAY 15 1989

STATE LICENSE NO. 211

Received: 04/28/89
Reported: 05/12/89
Job No. #: 70805

Karl
Mary

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

Total Petroleum Hydrocarbon Analysis
By EPA 5030 and DHS Extraction Methods
mg/kg

Lab ID	Client ID	Diesel	Gasoline	Total Lead
70805-1	3621 MW-15	ND<0.5	ND<0.5	ND<0.044
70805-2	3624 MW-14	ND<0.5	ND<0.5	ND<0.044
70805-3	3825 MW-16	ND<0.5	ND<0.5	ND<0.044
70805-4	3905 MW-17	ND<0.5	ND<0.5	ND<0.044
70805-5	3912 MW-18	ND<0.5	ND<0.5	ND<0.044
70805-6	3771 MW-13	ND<0.5	ND<0.5	ND<0.044
70805-7	3778 MW-12	ND<0.5	ND<0.5	ND<0.044
70805-8	3781 MW-11	ND<0.5	ND<0.5	ND<0.044
70805-9	3774 MW-10	ND<0.5	ND<0.5	ND<0.044
70805-10	3822 MW- 9	ND<0.5	ND<0.5	ND<0.044
70805-11	3901 MW- 5	ND<0.5	ND<0.5	ND<0.044
70805-12	3828 MW- 4	ND<0.5	ND<0.5	ND<0.044
70805-13	3627 MW- 1	ND<0.5	ND<0.5	ND<0.044

QA/QC: Spike Recovery as Diesel: 97.6%
Spike Recovery as Gasoline: 105%
Spike Recovery as Lead: 83%

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

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 MAY 15 1989

CERTIFICATE OF ANALYSIS

State License No. 211

Received: 04/28/89
Reported: 05/12/89
Job No #: 70805

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

Aromatic Volatile Hydrocarbon Analysis:
EPA Method 8020
ug/l

Lab ID	Client ID	Benzene	Toluene	MDL
70805-1	3621 MW-15	ND<0.3	ND<0.3	0.3
70805-2	3624 MW-14	ND<0.3	ND<0.3	0.3
70805-3	3825 MW-16	ND<0.3	ND<0.3	0.3
70805-4	3905 MW-17	ND<0.3	ND<0.3	0.3
70805-5	3912 MW-18	ND<0.3	ND<0.3	0.3
70805-6	3771 MW-13	ND<0.3	ND<0.3	0.3

Lab ID	Client ID	Ethylbenzene	Xylene	MDL
70805-1	3621 MW-15	ND<0.3	ND<0.3	0.3
70805-2	3624 MW-14	ND<0.3	ND<0.3	0.3
70805-3	3825 MW-16	ND<0.3	ND<0.3	0.3
70805-4	3905 MW-17	ND<0.3	ND<0.3	0.3
70805-5	3912 MW-18	ND<0.3	ND<0.3	0.3
70805-6	3771 MW-13	ND<0.3	ND<0.3	0.3

QA/QC: Spike Recovery for BTX Average: 100%

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. 70805

RECEIVED MAY 15 1989

Lab ID	Client ID	Benzene	Toluene	MDL
70805-7	3778 MW-12	ND<0.3	ND<0.3	0.3
70805-8	3781 MW-11	ND<0.3	ND<0.3	0.3
70805-9	3774 MW-10	ND<0.3	ND<0.3	0.3
70805-10	3822 MW- 9	ND<0.3	ND<0.3	0.3
70805-11	3901 MW- 5	ND<0.3	ND<0.3	0.3
70805-12	3828 MW- 4	ND<0.3	ND<0.3	0.3
70805-13	3627 MW- 1	ND<0.3	ND<0.3	0.3

Lab ID	Client ID	Ethylbenzene	Xylene	MDL
70805-7	3778 MW-12	ND<0.3	ND<0.3	0.3
70805-8	3781 MW-11	ND<0.3	ND<0.3	0.3
70805-9	3774 MW-10	ND<0.3	ND<0.3	0.3
70805-10	3822 MW- 9	ND<0.3	ND<0.3	0.3
70805-11	3901 MW- 5	ND<0.3	ND<0.3	0.3
70805-12	3828 MW- 4	ND<0.3	ND<0.3	0.3
70805-13	3627 MW- 1	ND<0.3	ND<0.3	0.3

ANANIA GEOLOGIC ENGINEERING

RECEIVED MAY 15 1989 70805

AGE Nº 1002

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

P.O. NO. | SAMPLERS: (signature) Eric J. Hall

LAB LOG NO.	DATE	TIME	SAMPLE I.D.	NO. OF CONTAINERS	SAMPLE TYPE: SOIL COMP	SOIL GRAB	WATER	ANALYSES: BTEX EPA 8020	TPH 6m1 ext M8015	TTLC Lead	8240	8270			REMARKS
	4/24/89		MW-15 3621	5			X	X	X	X	X	X			
	4/24/89		MW-19 3624	3			X	X	X	X					
	4/27/89		MW-16 3825	5			X	X	X	X	X	X			
	4/28/89		MW-17 3905	3			X	X	X	X					
	4/28/89		MW-18 3912	3			X	X	X	X					
	4/27/89		MW-13 3771	5			X	X	X	X	X	X			
	4/27/89		MW-12 3778	3	✓		X	X	X	X					
	4/27/89		MW-11 3781	3	✓		X	X	X	X					
	4/27/89		MW-10 3774	5	✓		X	X	X	X	X	X			
	4/27/89		MW-9 3822	3	✓		X	X	X	X					
	4/28/89		MW-5 3901	5	✓		X	X	X	X	X	X			
	4/27/89		MW-4 3828	3			X	X	X	X					

RELINQUISHED BY: (signature)	DATE/TIME	RECEIVED BY: (signature)
Eric J. Hall	4/28/89 3:30	Ray Fancher
RELINQUISHED BY: (signature)	DATE/TIME	RECEIVED BY: (signature)
RELINQUISHED BY: (signature)	DATE/TIME	RECEIVED BY: (signature)

REMARKS:
Send out 8240 & 8270 to contract Lab.
Regular TAT

SEND RESULTS TO:
ATTN: Mary Scruggs
Ananie Geologic Engineering
11330 Sunrise Park Dr. #C
Rancho Cordova, CA 95742
PHONE NO. (916) ~~431-8031~~ 631-0154

CHAIN OF CUSTODY

White - AGE Yellow - LAB Copy

ANANIA GEOLOGIC ENGINEERING

RECEIVED MAY 15 1989 AGE № 1005

PROJECT NO.	LAB REPORT NO.	NO. OF CONTAINERS	SAMPLE TYPE			ANALYSES								
004-88-05-9			SOIL		WATER	BTEX EPA 8020	TPH Gasoline M 8015	TTLC Lab						
P.O. NO.	SAMPLERS: (signature) Eric J. Ahl		COMP	GRAB										
LAB LOG NO.	DATE	TIME	SAMPLE I.D.											REMARKS
	4/27/89		3627 MW-1	3		X	X	X						

RELINQUISHED BY: (signature)	DATE/TIME	RECEIVED BY: (signature)
Eric J. Ahl	4/28/89 3:50	Ray Kuntzler
RELINQUISHED BY: (signature)	DATE/TIME	RECEIVED BY: (signature)
RELINQUISHED BY: (signature)	DATE/TIME	RECEIVED BY: (signature)

REMARKS:

Regular TAT

SEND RESULTS TO:

ATTN: Mary Scruggs
Anania Geologic Eng.
11330 Sunrise Park Dr. #C
Rancho Cordova, CA 95742
PHONE NO. (916) 454-9021

CHAIN OF CUSTODY

Clayton Environmental Consultants, Inc.

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

RECEIVED MAY 15 1989

May 12, 1989

Ms. Mary Scruggs
ANANIA GEOLOGIC ENGINEERING
11330 Sunrise Park Dr. #C
Rancho Cordova, CA 95742

Client Ref. No.:
Lab Batch No.: 8905026
Clayton Project No.: 23473.00
Client Code No.: 0636

Dear Ms. Scruggs:

Attached is our analytical laboratory report for the samples received on May 2, 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.:	(MW-15) 3621	Client:	ANANIA GEOLOGIC ENG.
Sample Received:	05/02/89	Client Ref. No.:	
Sample Analyzed:	05/03/89	Lab Client Code:	0636
Sample Matrix:	Water	Lab No.:	8905026-01

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
Acetone	ND	20
2-Butanone	ND	10
4-Methyl-2-pentanone	ND	10
2-Hexanone	ND	10
Vinyl Acetate	ND	6
Carbon Disulfide	ND	4
Styrene	ND	4

ND = Not detected at or above limit of detection.

EPA METHOD 8240
PURGEABLE ORGANICS

Sample I.D.:	(MW-16) 3825	Client:	ANANIA GEOLOGIC ENG.
Sample Received:	05/02/89	Client Ref. No.:	
Sample Analyzed:	05/03/89	Lab Client Code:	0636
Sample Matrix:	Water	Lab No.:	8905026-02

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
Acetone	ND	20
2-Butanone	ND	10
4-Methyl-2-pentanone	ND	10
2-Hexanone	ND	10
Vinyl Acetate	ND	6
Carbon Disulfide	ND	4
Styrene	ND	4

ND = Not detected at or above limit of detection.

EPA METHOD 8240
PURGEABLE ORGANICS

Sample I.D.:	(MW-13) 3771	Client:	ANANIA GEOLOGIC ENG.
Sample Received:	05/02/89	Client Ref. No.:	
Sample Analyzed:	05/03/89	Lab Client Code:	0636
Sample Matrix:	Water	Lab No.:	8905026-03

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
Acetone	ND	20
2-Butanone	ND	10
4-Methyl-2-pentanone	ND	10
2-Hexanone	ND	10
Vinyl Acetate	ND	6
Carbon Disulfide	ND	4
Styrene	ND	4

ND = Not detected at or above limit of detection.

EPA METHOD 8240
PURGEABLE ORGANICS

Sample I.D.:	(MW-10) 3774	Client:	ANANIA GEOLOGIC ENG.
Sample Received:	05/02/89	Client Ref. No.:	
Sample Analyzed:	05/03/89	Lab Client Code:	0636
Sample Matrix:	Water	Lab No.:	8905026-04

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
Acetone	ND	20
2-Butanone	ND	10
4-Methyl-2-pentanone	ND	10
2-Hexanone	ND	10
Vinyl Acetate	ND	6
Carbon Disulfide	ND	4
Styrene	ND	4

ND = Not detected at or above limit of detection.

EPA METHOD 8240
PURGEABLE ORGANICS

Sample I.D.:	(MW-5) 3901	Client:	ANANIA GEOLOGIC ENG.
Sample Received:	05/02/89	Client Ref. No.:	
Sample Analyzed:	05/03/89	Lab Client Code:	0636
Sample Matrix:	Water	Lab No.:	8905026-05

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
Acetone	ND	20
2-Butanone	ND	10
4-Methyl-2-pentanone	ND	10
2-Hexanone	ND	10
Vinyl Acetate	ND	6
Carbon Disulfide	ND	4
Styrene	ND	4

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.:	
Sample Analyzed:	05/03/89	Lab Client Code:	0636
Sample Matrix:	Water	Lab No.:	8905026-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
Acetone	ND	20
2-Butanone	ND	10
4-Methyl-2-pentanone	ND	10
2-Hexanone	ND	10
Vinyl Acetate	ND	6
Carbon Disulfide	ND	4
Styrene	ND	4

ND = Not detected at or above limit of detection.

EPA METHOD 8270
BASE/NEUTRALS AND ACIDS

Sample I.D.:	(MW-15) 3621	Client:	ANANIA GEOLOGIC ENG.
Sample Received:	05/02/89	Client Ref. No.:	
Sample Analyzed:	05/09/89	Lab Client Code:	0636
Sample Matrix:	Water	Lab No.:	8905026-01

	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 Naphthalene	ND	1

ND = Not detected at or above limit of detection

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

Sample I.D.: (MW-15) 3621 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	20	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.:	(MW-16) 3825	Client:	ANANIA GEOLOGIC ENG.
Sample Received:	05/02/89	Client Ref. No.:	
Sample Analyzed:	05/09/89	Lab Client Code:	0636
Sample Matrix:	Water	Lab No.:	8905026-02

	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 Naphthalene	ND	1

ND = Not detected at or above limit of detection

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

Sample I.D.: (MW-16) 3825 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	150	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.:	(MW-13) 3771	Client:	ANANIA GEOLOGIC ENG.
Sample Received:	05/02/89	Client Ref. No.:	
Sample Analyzed:	05/09/89	Lab Client Code:	0636
Sample Matrix:	Water	Lab No.:	8905026-03

	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 Naphthalene	ND	1

ND = Not detected at or above limit of detection

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

Sample I.D.: (MW-13) 3771 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.:	(MW-10) 3774	Client:	ANANIA GEOLOGIC ENG.
Sample Received:	05/02/89	Client Ref. No.:	
Sample Analyzed:	05/09/89	Lab Client Code:	0636
Sample Matrix:	Water	Lab No.:	8905026-04

	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 Naphthalene	ND	1

ND = Not detected at or above limit of detection

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

Sample I.D.: (MW-10) 3774 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	80	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.:	(MW-5) 3901	Client:	ANANIA GEOLOGIC ENG.
Sample Received:	05/02/89	Client Ref. No.:	
Sample Analyzed:	05/09/89	Lab Client Code:	0636
Sample Matrix:	Water	Lab No.:	8905026-05

	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 Naphthalene	ND	1

ND = Not detected at or above limit of detection

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

Sample I.D.: (MW-5) 3901 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	2	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.:	
Sample Analyzed:	05/09/89	Lab Client Code:	0636
Sample Matrix:	Water	Lab No.:	8905026-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 Naphthalene	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

8905026

CHAIN OF CUSTODY RECORD

PROJ. NO.

SAMPLERS: (Signature) Contact Marry Scruggs

PROJECT NAME AND ADDRESS:
Angnig Geologic Engineering (916) 631-0159
11330 Sunrise Park Dr #C
Rancho - Cordova - Ca-95742

Regular TAT

CROSS REFERENCE NUMBER	DATE	TIME	SOIL	WATER	STATION LOCATION (Sample ID)	TOTAL PETROLEUM HYDROCARBONS	BTX	VOC-EPA 8240	TOTAL OIL & GREASE	8240	8270	REMARKS
	4/26/89				(MW-15) 3621				X	X		
	4/27/89				(MW-16) 3825				X	X		
	4/27/89				(MW-13) 3771				X	X		
	4/27/89				(MW-10) 3774				X	X		
	4/28/89				(MW-5) 3901				X	X		

ANALYSIS REQUESTED

RELINQUISHED BY: (Signature)	DATE / TIME	RECEIVED BY: (Signature)	DATE / TIME
Surinder Pal Sidhu	5/2/89 12:30	Terry Dalio	5-2-89 2:00 pm
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

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

RECEIVED JUN 30 1989

CERTIFICATE OF ANALYSIS

State License No. 211

Received: 06/09/89
Reported: 06/22/89
Job No #: 70878

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 Method 5030 and DHS Extraction Method
Oil & Grease Analysis: By Standard Method 503D
Hydrocarbons Analysis; By Std Method 503E
mg/l

Lab ID	Client ID	Gasoline	Diesel	Oil & Grease	Hydrocarbons
70878-1	4149 MW-1	ND<0.5	ND<0.5	ND<50	0.3
70878-2	4150 MW-4	ND<0.5	ND<0.5	ND<50	0.8
70878-3	4152 MW-9	ND<0.5	ND<0.5	ND<50	0.6
70878-4	4157 MW-10	ND<0.5	ND<0.5	ND<50	0.5
70878-5	4169 MW-21	ND<0.5	ND<0.5	ND<50	0.3
70878-6	4174 MW-15	ND<0.5	ND<0.5	ND<50	0.1
70878-7	4181 MW-14	ND<0.5	ND<0.5	ND<50	N/D

QA/QC: Spike Recovery for Gasoline: 104%
Spike Recovery for Diesel: 95%
Spike Recovery for Oil & Grease: 99.2%

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

Detection Limit for Gasoline: 0.5
Detection Limit for Diesel: 0.5
Detection Limit for Oil & Grease: 50

Jaime Chow
Laboratory Director

RECEIVED JUN 30 1989

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

Anania Geological Engineering
Job No. 70878

Total Petroleum Hydrocarbon Analysis;
By EPA Method 5030 and DHS Extraction Method
Oil & Grease Analysis: By Standard Method 503D
Hydrocarbons Analysis; By Std Method 503E
mg/l

Lab ID	Client ID	Gasoline	Diesel	Oil & Grease	Hydrocarbons
70878-8	4189 MW-22	ND<0.5	ND<0.5	ND<50	0.4
70878-9	3197 MW-16	ND<0.5	ND<0.5	ND<50	0.4
70878-10	4151 MW-5	ND<0.5	ND<0.5	ND<50	0.3
70878-11	3205 MW-12	ND<0.5	ND<0.5	ND<50	0.4
70878-12	3209 MW-13	ND<0.5	ND<0.5	ND<50	0.1
70878-13	4164 MW-11	ND<0.5	ND<0.5	ND<50	0.5
70878-14	3225 MW-2	ND<0.5	ND<0.5	ND<50	0.5

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

RECEIVED JUN 30 1989

CERTIFICATE OF ANALYSIS

State License No. 211

Received: 06/09/89
Reported: 06/22/89
Job No #: 70878

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	Ethylbenzene	Toluene	Xylene	MDL
70878-1	4149 MW-1	ND<0.3	ND<0.3	ND<0.3	ND<0.3	0.3
70878-2	4150 MW-4	ND<0.3	ND<0.3	ND<0.3	ND<0.3	0.3
70878-3	4152 MW-9	ND<0.3	ND<0.3	ND<0.3	ND<0.3	0.3
70878-4	4157 MW-10	ND<0.3	ND<0.3	ND<0.3	ND<0.3	0.3
70878-5	4169 MW-21	ND<0.3	ND<0.3	ND<0.3	ND<0.3	0.3
70878-7	4181 MW-14	ND<0.3	ND<0.3	ND<0.3	ND<0.3	0.3
70878-8	4189 MW-22	ND<0.3	ND<0.3	ND<0.3	ND<0.3	0.3
70878-11	3205 MW-12	ND<0.3	ND<0.3	ND<0.3	ND<0.3	0.3
70878-13	4164 MW-11	ND<0.3	ND<0.3	ND<0.3	ND<0.3	0.3
70878-14	3225 MW-2	ND<0.3	ND<0.3	ND<0.3	ND<0.3	0.3

QA/QC: Spike Recovery Average: 97%

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

STATE LICENSE NO. 211

Received: 06/09/89
Reported: 06/28/89
Job #: 70878

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

Project: #004-88-059

Analysis Method EPA 6010
Prep Method EPA 3010
mg/kg

Lab ID	Client ID	Total Lead	MDL	% SPIKE RECOVERY
70878-1	4149 MW-1	ND<0.044	0.044	83
70878-2	4150 MW-4	ND<0.044	0.044	83
70878-3	4152 MW-9	ND<0.044	0.044	83
70878-4	4157 MW-10	ND<0.044	0.044	83
70878-5	4169 MW-21	ND<0.044	0.044	83
70878-6	4174 MW-15	ND<0.044	0.044	83
70878-7	4181 MW-14	ND<0.044	0.044	83
70878-8	4189 MW-22	ND<0.044	0.044	83
70878-9	3197 MW-16	ND<0.044	0.044	83
70878-10	4151 MW-5	ND<0.044	0.044	83
70878-11	3205 MW-12	ND<0.044	0.044	83
70878-12	3209 MW-13	ND<0.044	0.044	83
70878-13	4164 MW-11	ND<0.044	0.044	83
70878-14	3225 MW-2	ND<0.044	0.044	83

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

Jaime Chow
Laboratory Director

RECEIVED JUN 3 0 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: 06/09/89
Reported: 06/28/89
Job #: 70878

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

Project: #004-88-059

Analysis Method EPA 6010
STLC
mg/l

Lab ID	Client ID	STLC Lead	MDL	% SPIKE RECOVERY
70878-1	4149 MW-1	ND<0.044	0.044	80
70878-2	4150 MW-4	ND<0.044	0.044	80
70878-3	4152 MW-9	ND<0.044	0.044	80
70878-4	4157 MW-10	ND<0.044	0.044	80
70878-5	4169 MW-21	ND<0.044	0.044	80
70878-6	4174 MW-15	ND<0.044	0.044	80
70878-7	4181 MW-14	ND<0.044	0.044	80
70878-8	4189 MW-22	ND<0.044	0.044	80
70878-9	3197 MW-16	ND<0.044	0.044	80
70878-10	4151 MW-5	ND<0.044	0.044	80
70878-11	3205 MW-12	ND<0.044	0.044	80
70878-12	3209 MW-13	ND<0.044	0.044	80
70878-13	4164 MW-11	ND<0.044	0.044	80
70878-14	3225 MW-2	ND<0.044	0.044	80

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

Jaime Chow
Laboratory Director

ANANIA GEOLOGIC ENGINEERING

AGE

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

LAB LOG NO.	DATE	TIME	SAMPLE I.D.	NO. OF CONTAINERS	SAMPLE TYPE: SOIL COMP	SOIL GRAB	WATER	ANALYSES: Oil and Grease 503A and SOXE	BTEX 8020	TPH Gas and Diesel M8015	TTLC Lead	STLC Lead	8240	8270	REMARKS
	6/7/89		4149 MW1	5			X	X	X	X	X	X			
	6/7/89		4150 MW4	5			X	X	X	X	X	X			
	6/7/89		4152 MW9	5			X	X	X	X	X	X			
	6/7/89		4157 MW10	7			X	X		X	X	X	X	X	
	6/7/89		4169 MW-21	5			X	X	X	X	X	X			
	6/7/89		4174 MW-15	7			X	X		X	X	X	X	X	
	6/7/89		4181 MW-19	5			X	X	X	X	X	X			
	6/7/89		4189 MW-22	5			X	X	X	X	X	X			
	6/8/89		3197 MW-16	7			X	X		X	X	X	X	X	
	6/8/89		4151 MW-5	7			X	X		X	X	X	X	X	
	6/8/89		3205 MW-12	5			X	X	X	X	X	X			
	6/8/89		3209 MW-13	7			X	X		X	X	X	X	X	

RELINQUISHED BY: (signature)	DATE/TIME	RECEIVED BY: (signature)
John Russell	6/9/89 /12:30pm	Raj Pandher
RELINQUISHED BY: (signature)	DATE/TIME	RECEIVED BY: (signature)
RELINQUISHED BY: (signature)	DATE/TIME	RECEIVED BY: (signature)

REMARKS:
Regular TAT
8240 and 8270 to ~~EET~~ ITT
*

SEND RESULTS TO: ACE
ATTN: Mary Scraggs
11330 Sunrise Park Dr, Suite C
Rancho Cordova, CA 95742
PHONE NO. (916) ~~851-8921~~

CHAIN OF CUSTODY

631-0154

White- ACE Yellow- LAB Copy Pink- File

ANANIA GEOLOGIC ENGINEERING

AGE

PROJECT NO.	LAB REPORT NO.	NO. OF CONTAINERS	SAMPLE TYPE			ANALYSES								REMARKS
004-88-059			SOIL		WATER	Oil and Grease 503A and 503E	BTEX 8020	TPH Gas and Diesel M8015	TTLC Lead	STLC Lead	8240	8270		
P.O. NO.	SAMPLERS: (signature) John Russell		COMP	GRAB										
LAB LOG NO.	DATE	TIME	SAMPLE I.D.											
	6/8/89		4164 MW-11	5		X	X	X	X	X	X			
	6/9/89		3225 MW-2	5		X	X	X	X	X	X			

RELINQUISHED BY: (signature)	DATE/TIME	RECEIVED BY: (signature)
John Russell	6/9/89 12:30pm	Raj Pandher
RELINQUISHED BY: (signature)	DATE/TIME	RECEIVED BY: (signature)
RELINQUISHED BY: (signature)	DATE/TIME	RECEIVED BY: (signature)

REMARKS:
Regular TAT
8240 and 8270 to CEL

SEND RESULTS TO:
ATTN: Mary Scruggs
AGE
11330 Sunrise Park Dr, Suite C
Rancho Cordova, CA 95742
PHONE NO. (916) ~~451-0821~~

CHAIN OF CUSTODY

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631-0154

INTERNATIONAL TECHNOLOGY CORPORATION

ANALYTICAL SERVICES

RECEIVED JUN 3 0 1989

CERTIFICATE OF ANALYSIS

Anania Geologic Engineering
11330 Sunrise Park Dr., Suite #C
Rancho Cordova, CA 95742
ATTN: Mary Scruggs

Date: June 28, 1989

Work Order Number: S9-06-158

P.O. Number: Verbal

cc Karl
Mary
John

This is the Certificate of Analysis for the following samples:

Client Project ID:	70878 Anania Geologic
Date Received by Lab:	6/13/89
Number of Samples:	5
Sample Type:	Water

The method of analysis for volatile organics is taken from E.P.A. Methods 624 and 8240. Water samples and low-level soil samples are analyzed directly using the purge and trap technique. Medium-level soil samples are extracted with methanol and a portion of the extract is analyzed using the purge and trap technique. Final detection is by gas chromatography/mass spectrometry.

The method of analysis for semi-volatile organics is taken from E.P.A. Methods 625 and 8270. The samples are extracted with solvent and concentrated. Final detection is by gas chromatography/mass spectrometry.

Any of the compounds in a table of results would have been detected had it been present at or above the limit of detection listed. Detection limits are adjusted to reflect dilution of the sample. Also, detection limits may vary due to sample matrix.

The sample results are net values based on method blank subtraction.

Reviewed and Approved

David A. Pichette

David A. Pichette
Project Manager

DAP/an
10 Pages Following - Tables of Results

IT ANALYTICAL SERVICES
SAN JOSE, CA

Client Project ID: 70878, Anania Geologic

Work Order Number: S9-06-158

Client Sample ID: 4157 (70878-4)

Sample Date: 6/7/89
Lab Sample ID: S9-06-158-01
Receipt Condition: Cool
Analysis Date: 6/20/89

Volatile Organics - E.P.A. Methods 624, 8240

Results - Micrograms per Liter

Parameter	Detection Limit	Detected	Parameter	Detection Limit	Detected
Chloromethane	10.	None	cis-1,3-Dichloropropene	5.	None
Bromomethane	10.	None	Trichloroethene	5.	None
Vinyl Chloride	10.	None	Chlorodibromomethane	5.	None
Chloroethane	10.	None	1,1,2-Trichloroethane	5.	None
Methylene Chloride	5.	None	Benzene	5.	None
Acetone	10.	None	trans-1,3-Dichloropropene	5.	None
Carbon Disulfide	5.	None	Bromoform	5.	None
1,1-Dichloroethene	5.	None	4-Methyl-2-pentanone	10.	None
1,1-Dichloroethane	5.	None	2-Hexanone	10.	None
1,2-Dichloroethene (Total)	5.	None	Tetrachloroethene	5.	None
Chloroform	5.	None	1,1,2,2-Tetrachloroethane	5.	None
1,2-Dichlorethane	5.	None	Toluene	5.	None
2-Butanone	10.	None	Chlorobenzene	5.	None
1,1,1-Trichloroethane	5.	None	Ethylbenzene	5.	None
Carbon Tetrachloride	5.	None	Styrene	5.	None
Vinyl Acetate	10.	None	Xylenes (Total)	5.	None
Bromodichloromethane	5.	None	Acrolein	10.	None
1,2-Dichloropropane	5.	None	Acrylonitrile	10.	None

Surrogates	Limits	% Rec
1,2-Dichloroethane-d4	76-114	102.
Toluene-d8	88-110	101.
4-Bromofluorobenzene	86-115	97.

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IT ANALYTICAL SERVICES
SAN JOSE, CA

Date: June 28, 1989

Client Project ID: 70878, Anania Geologic

Work Order Number: S9-06-158

Client Sample ID: 4157 (70878-4)

Sample Date: 6/7/89
Lab Sample ID: S9-06-158-01
Receipt Condition: Cool, pH >2
Extraction Date: 6/14/89
Analysis Date: 6/22/89

Semi-Volatile Organics -E.P.A. Methods 625, 8270; Results - Micrograms per Liter

Parameter	Detection Limit	Detected	Parameter	Detection Limit	Detected
Phenol	10.	None	2,4-Dinitrophenol	50.	None
bis(2-Chloroethyl)ether	10.	None	4-Nitrophenol	50.	None
2-Chlorophenol	10.	None	Dibenzofuran	10.	None
1,3-Dichlorobenzene	10.	None	2,4-Dinitrotoluene	10.	None
1,4-Dichlorobenzene	10.	None	2,6-Dinitrotoluene	10.	None
Benzyl alcohol	10.	None	Diethylphthalate	10.	None
1,2-Dichlorobenzene	10.	None	4-Chlorophenylphenyl ether	10.	None
2-Methylphenol	10.	None	Fluorene	10.	None
bis(2-Chloroisopropyl)ether	10.	None	4-Nitroaniline	50.	None
4-Methylphenol	10.	None	4,6-Dinitro-o-cresol	50.	None
N-Nitroso-di-n-propylamine	10.	None	N-Nitrosodiphenylamine	10.	None
Hexachloroethane	10.	None	4-Bromophenylphenyl ether	10.	None
Nitrobenzene	10.	None	Hexachlorobenzene	10.	None
Isophorone	10.	None	Pentachlorophenol	50.	None
2-Nitrophenol	10.	None	Phenanthrene	10.	None
2,4-Dimethylphenol	10.	None	Anthracene	10.	None
Benzoic Acid	50.	None	Di-n-butylphthalate	10.	None
bis(2-Chloroethoxy)methane	10.	None	Fluoranthene	10.	None
2,4-Dichlorophenol	10.	None	Pyrene	10.	None
1,2,4-Trichlorobenzene	10.	None	Butylbenzylphthalate	10.	None
Naphthalene	10.	None	3,3'-Dichlorobenzidine	20.	None
4-Chloroaniline	10.	None	Benzo(a)anthracene	10.	None
Hexachlorobutadiene	10.	None	bis(2-Ethylhexyl)phthalate	10.	None
4-Chloro-3-methylphenol	10.	None	Chrysene	10.	None
2-Methylnaphthalene	10.	None	Di-n-octylphthalate	10.	None
Hexachlorocyclopentadiene	10.	None	Benzo(b)fluoranthene	10.	None
2,4,6-Trichlorophenol	10.	None	Benzo(k)fluoranthene	10.	None
2,4,5-Trichlorophenol	10.	None	Benzo(a)pyrene	10.	None
2-Chloronaphthalene	10.	None	Indeno(1,2,3-cd)pyrene	10.	None
2-Nitroaniline	50.	None	Dibenz(a,h)anthracene	10.	None
Dimethylphthalate	10.	None	Benzo(g,h,i)perylene	10.	None
Acenaphthylene	10.	None	N-Nitrosodimethylamine	10.	None
3-Nitroaniline	50.	None	1,2-Diphenylhydrazine	10.	None
Acenaphthene	10.	None	Benzidine	50.	None

Surrogates	Limits	% Rec	Surrogates	Limits	% Rec
Nitrobenzene-d5	35-114	66.	Phenol-d5	10-94	26.
2-Fluorobiphenyl	43-116	69.	2-Fluorophenol	21-100	35.
Terphenyl-d14	33-141	63.	2,4,6-Tribromophenol	10-123	85.

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IT ANALYTICAL SERVICES
SAN JOSE, CA

Date: June 28, 1989

Client Project ID: 70878, Anania Geologic

Work Order Number: S9-06-158

Client Sample ID: 4174 (70878-6)

Sample Date: 6/7/89
Lab Sample ID: S9-06-158-02
Receipt Condition: Cool
Analysis Date: 6/20/89

Volatile Organics - E.P.A. Methods 624, 8240

Results - Micrograms per Liter

Parameter	Detection Limit	Detected	Parameter	Detection Limit	Detected
Chloromethane	10.	None	cis-1,3-Dichloropropene	5.	None
Bromomethane	10.	None	Trichloroethene	5.	None
Vinyl Chloride	10.	None	Chlorodibromomethane	5.	None
Chloroethane	10.	None	1,1,2-Trichloroethane	5.	None
Methylene Chloride	5.	6.	Benzene	5.	None
Acetone	10.	None	trans-1,3-Dichloropropene	5.	None
Carbon Disulfide	5.	None	Bromoform	5.	None
1,1-Dichloroethene	5.	None	4-Methyl-2-pentanone	10.	None
1,1-Dichloroethane	5.	None	2-Hexanone	10.	None
1,2-Dichloroethene (Total)	5.	None	Tetrachloroethene	5.	None
Chloroform	5.	None	1,1,2,2-Tetrachloroethane	5.	None
1,2-Dichlorethane	5.	None	Toluene	5.	None
2-Butanone	10.	None	Chlorobenzene	5.	None
1,1,1-Trichloroethane	5.	None	Ethylbenzene	5.	None
Carbon Tetrachloride	5.	None	Styrene	5.	None
Vinyl Acetate	10.	None	Xylenes (Total)	5.	None
Bromodichloromethane	5.	None	Acrolein	10.	None
1,2-Dichloropropane	5.	None	Acrylonitrile	10.	None

Surrogates	Limits	% Rec
1,2-Dichloroethane-d4	76-114	101.
Toluene-d8	88-110	100.
4-Bromofluorobenzene	86-115	99.

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IT ANALYTICAL SERVICES
SAN JOSE, CA

Client Project ID: 70878, Anania Geologic

Work Order Number: S9-06-158

Client Sample ID: 4174 (70878-6)

Sample Date: 6/7/89
Lab Sample ID: S9-06-158-02
Receipt Condition: Cool
Extraction Date: 6/14/89
Analysis Date: 6/22/89

Semi-Volatile Organics -E.P.A. Methods 625, 8270; Results - Micrograms per Liter

Parameter	Detection Limit	Detected	Parameter	Detection Limit	Detected
Phenol	10.	None	2,4-Dinitrophenol	50.	None
bis(2-Chloroethyl)ether	10.	None	4-Nitrophenol	50.	None
2-Chlorophenol	10.	None	Dibenzofuran	10.	None
1,3-Dichlorobenzene	10.	None	2,4-Dinitrotoluene	10.	None
1,4-Dichlorobenzene	10.	None	2,6-Dinitrotoluene	10.	None
Benzyl alcohol	10.	None	Diethylphthalate	10.	None
1,2-Dichlorobenzene	10.	None	4-Chlorophenylphenyl ether	10.	None
2-Methylphenol	10.	None	Fluorene	10.	None
bis(2-Chloroisopropyl)ether	10.	None	4-Nitroaniline	50.	None
4-Methylphenol	10.	None	4,6-Dinitro-o-cresol	50.	None
N-Nitroso-di-n-propylamine	10.	None	N-Nitrosodiphenylamine	10.	None
Hexachloroethane	10.	None	4-Bromophenylphenyl ether	10.	None
Nitrobenzene	10.	None	Hexachlorobenzene	10.	None
Isophorone	10.	None	Pentachlorophenol	50.	None
2-Nitrophenol	10.	None	Phenanthrene	10.	None
2,4-Dimethylphenol	10.	None	Anthracene	10.	None
Benzoic Acid	50.	None	Di-n-butylphthalate	10.	None
bis(2-Chloroethoxy)methane	10.	None	Fluoranthene	10.	None
2,4-Dichlorophenol	10.	None	Pyrene	10.	None
1,2,4-Trichlorobenzene	10.	None	Butylbenzylphthalate	10.	None
Naphthalene	10.	None	3,3'-Dichlorobenzidine	20.	None
4-Chloroaniline	10.	None	Benzo(a)anthracene	10.	None
Hexachlorobutadiene	10.	None	bis(2-Ethylhexyl)phthalate	10.	None
4-Chloro-3-methylphenol	10.	None	Chrysene	10.	None
2-Methylnaphthalene	10.	None	Di-n-octylphthalate	10.	None
Hexachlorocyclopentadiene	10.	None	Benzo(b)fluoranthene	10.	None
2,4,6-Trichlorophenol	10.	None	Benzo(k)fluoranthene	10.	None
2,4,5-Trichlorophenol	10.	None	Benzo(a)pyrene	10.	None
2-Chloronaphthalene	10.	None	Indeno(1,2,3-cd)pyrene	10.	None
2-Nitroaniline	50.	None	Dibenz(a,h)anthracene	10.	None
Dimethylphthalate	10.	None	Benzo(g,h,i)perylene	10.	None
Acenaphthylene	10.	None	N-Nitrosodimethylamine	10.	None
3-Nitroaniline	50.	None	1,2-Diphenylhydrazine	10.	None
Acenaphthene	10.	None	Benzidine	50.	None

Surrogates	Limits	% Rec	Surrogates	Limits	% Rec
Nitrobenzene-d5	35-114	78.	Phenol-d5	10-94	40.
2-Fluorobiphenyl	43-116	80.	2-Fluorophenol	21-100	51.
Terphenyl-d14	33-141	69.	2,4,6-Tribromophenol	10-123	90.

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IT ANALYTICAL SERVICES
SAN JOSE, CA

Client Project ID: 70878, Anania Geologic

Work Order Number: S9-06-158

Client Sample ID: 3197 (70878-9)

Sample Date: 6/7/89
Lab Sample ID: S9-06-158-03
Receipt Condition: Cool
Analysis Date: 6/20/89

Volatile Organics - E.P.A. Methods 624, 8240

Results - Micrograms per Liter

Parameter	Detection Limit	Detected	Parameter	Detection Limit	Detected
Chloromethane	10.	None	cis-1,3-Dichloropropene	5.	None
Bromomethane	10.	None	Trichloroethene	5.	None
Vinyl Chloride	10.	None	Chlorodibromomethane	5.	None
Chloroethane	10.	None	1,1,2-Trichloroethane	5.	None
Methylene Chloride	5.	None	Benzene	5.	None
Acetone	10.	None	trans-1,3-Dichloropropene	5.	None
Carbon Disulfide	5.	None	Bromoform	5.	None
1,1-Dichloroethene	5.	None	4-Methyl-2-pentanone	10.	None
1,1-Dichloroethane	5.	None	2-Hexanone	10.	None
1,2-Dichloroethene (Total)	5.	None	Tetrachloroethene	5.	None
Chloroform	5.	None	1,1,2,2-Tetrachloroethane	5.	None
1,2-Dichlorethane	5.	None	Toluene	5.	None
2-Butanone	10.	None	Chlorobenzene	5.	None
1,1,1-Trichloroethane	5.	None	Ethylbenzene	5.	None
Carbon Tetrachloride	5.	None	Styrene	5.	None
Vinyl Acetate	10.	None	Xylenes (Total)	5.	None
Bromodichloromethane	5.	None	Acrolein	10.	None
1,2-Dichloropropane	5.	None	Acrylonitrile	10.	None

Surrogates	Limits	% Rec
1,2-Dichloroethane-d4	76-114	102.
Toluene-d8	88-110	101.
4-Bromofluorobenzene	86-115	95.

IT ANALYTICAL SERVICES
SAN JOSE, CA

Client Project ID: 70878, Anania Geologic

Work Order Number: S9-06-158

Client Sample ID: 3197 (70878-9)

Sample Date: 6/7/89
Lab Sample ID: S9-06-158-03
Receipt Condition: Cool
Extraction Date: 6/14/89
Analysis Date: 6/22/89

Semi-Volatile Organics -E.P.A. Methods 625, 8270; Results - Micrograms per Liter

Parameter	Detection Limit	Detected	Parameter	Detection Limit	Detected
Phenol	10.	None	2,4-Dinitrophenol	50.	None
bis(2-Chloroethyl)ether	10.	None	4-Nitrophenol	50.	None
2-Chlorophenol	10.	None	Dibenzofuran	10.	None
1,3-Dichlorobenzene	10.	None	2,4-Dinitrotoluene	10.	None
1,4-Dichlorobenzene	10.	None	2,6-Dinitrotoluene	10.	None
Benzyl alcohol	10.	None	Diethylphthalate	10.	None
1,2-Dichlorobenzene	10.	None	4-Chlorophenylphenyl ether	10.	None
2-Methylphenol	10.	None	Fluorene	10.	None
bis(2-Chloroisopropyl)ether	10.	None	4-Nitroaniline	50.	None
4-Methylphenol	10.	None	4,6-Dinitro-o-cresol	50.	None
N-Nitroso-di-n-propylamine	10.	None	N-Nitrosodiphenylamine	10.	None
Hexachloroethane	10.	None	4-Bromophenylphenyl ether	10.	None
Nitrobenzene	10.	None	Hexachlorobenzene	10.	None
Isophorone	10.	None	Pentachlorophenol	50.	None
2-Nitrophenol	10.	None	Phenanthrene	10.	None
2,4-Dimethylphenol	10.	None	Anthracene	10.	None
Benzoic Acid	50.	None	Di-n-butylphthalate	10.	None
bis(2-Chloroethoxy)methane	10.	None	Fluoranthene	10.	None
2,4-Dichlorophenol	10.	None	Pyrene	10.	None
1,2,4-Trichlorobenzene	10.	None	Butylbenzylphthalate	10.	None
Naphthalene	10.	None	3,3'-Dichlorobenzidine	20.	None
4-Chloroaniline	10.	None	Benzo(a)anthracene	10.	None
Hexachlorobutadiene	10.	None	bis(2-Ethylhexyl)phthalate	10.	None
4-Chloro-3-methylphenol	10.	None	Chrysene	10.	None
2-Methylnaphthalene	10.	None	Di-n-octylphthalate	10.	None
Hexachlorocyclopentadiene	10.	None	Benzo(b)fluoranthene	10.	None
2,4,6-Trichlorophenol	10.	None	Benzo(k)fluoranthene	10.	None
2,4,5-Trichlorophenol	10.	None	Benzo(a)pyrene	10.	None
2-Chloronaphthalene	10.	None	Indeno(1,2,3-cd)pyrene	10.	None
2-Nitroaniline	50.	None	Dibenz(a,h)anthracene	10.	None
Dimethylphthalate	10.	None	Benzo(g,h,i)perylene	10.	None
Acenaphthylene	10.	None	N-Nitrosodimethylamine	10.	None
3-Nitroaniline	50.	None	1,2-Diphenylhydrazine	10.	None
Acenaphthene	10.	None	Benzidine	50.	None

Surrogates	Limits	% Rec	Surrogates	Limits	% Rec
Nitrobenzene-d5	35-114	84.	Phenol-d5	10-94	34.
2-Fluorobiphenyl	43-116	85.	2-Fluorophenol	21-100	46.
Terphenyl-d14	33-141	60.	2,4,6-Tribromophenol	10-123	84.

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IT ANALYTICAL SERVICES
SAN JOSE, CA

Client Project ID: 70878, Anania Geologic

Work Order Number: S9-06-158

Client Sample ID: 4151 (70878-10)

Sample Date: 6/7/89
Lab Sample ID: S9-06-158-04
Receipt Condition: Cool
Analysis Date: 6/20/89

Volatile Organics - E.P.A. Methods 624, 8240

Results - Micrograms per Liter

Parameter	Detection Limit	Detected	Parameter	Detection Limit	Detected
Chloromethane	10.	None	cis-1,3-Dichloropropene	5.	None
Bromomethane	10.	None	Trichloroethene	5.	None
Vinyl Chloride	10.	None	Chlorodibromomethane	5.	None
Chloroethane	10.	None	1,1,2-Trichloroethane	5.	None
Methylene Chloride	5.	None	Benzene	5.	None
Acetone	10.	None	trans-1,3-Dichloropropene	5.	None
Carbon Disulfide	5.	None	Bromoform	5.	None
1,1-Dichloroethene	5.	None	4-Methyl-2-pentanone	10.	None
1,1-Dichloroethane	5.	None	2-Hexanone	10.	None
1,2-Dichloroethene (Total)	5.	None	Tetrachloroethene	5.	None
Chloroform	5.	None	1,1,2,2-Tetrachloroethane	5.	None
1,2-Dichlorethane	5.	None	Toluene	5.	None
2-Butanone	10.	None	Chlorobenzene	5.	None
1,1,1-Trichloroethane	5.	None	Ethylbenzene	5.	None
Carbon Tetrachloride	5.	None	Styrene	5.	None
Vinyl Acetate	10.	None	Xylenes (Total)	5.	None
Bromodichloromethane	5.	None	Acrolein	10.	None
1,2-Dichloropropane	5.	None	Acrylonitrile	10.	None

Surrogates	Limits	% Rec
1,2-Dichloroethane-d4	76-114	102.
Toluene-d8	88-110	101.
4-Bromofluorobenzene	86-115	98.

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IT ANALYTICAL SERVICES
SAN JOSE, CA

Client Project ID: 70878, Anania Geologic

Work Order Number: S9-06-158

Client Sample ID: 4151 (70878-10)

Sample Date: 6/7/89
Lab Sample ID: S9-06-158-04
Receipt Condition: Cool
Extraction Date: 6/14/89
Analysis Date: 6/22/89

Semi-Volatile Organics -E.P.A. Methods 625, 8270; Results - Micrograms per Liter

Parameter	Detection Limit	Detected	Parameter	Detection Limit	Detected
Phenol	10.	None	2,4-Dinitrophenol	50.	None
bis(2-Chloroethyl)ether	10.	None	4-Nitrophenol	50.	None
2-Chlorophenol	10.	None	Dibenzofuran	10.	None
1,3-Dichlorobenzene	10.	None	2,4-Dinitrotoluene	10.	None
1,4-Dichlorobenzene	10.	None	2,6-Dinitrotoluene	10.	None
Benzyl alcohol	10.	None	Diethylphthalate	10.	None
1,2-Dichlorobenzene	10.	None	4-Chlorophenylphenyl ether	10.	None
2-Methylphenol	10.	None	Fluorene	10.	None
bis(2-Chloroisopropyl)ether	10.	None	4-Nitroaniline	50.	None
4-Methylphenol	10.	None	4,6-Dinitro-o-cresol	50.	None
N-Nitroso-di-n-propylamine	10.	None	N-Nitrosodiphenylamine	10.	None
Hexachloroethane	10.	None	4-Bromophenylphenyl ether	10.	None
Nitrobenzene	10.	None	Hexachlorobenzene	10.	None
Isophorone	10.	None	Pentachlorophenol	50.	None
2-Nitrophenol	10.	None	Phenanthrene	10.	None
2,4-Dimethylphenol	10.	None	Anthracene	10.	None
Benzoic Acid	50.	None	Di-n-butylphthalate	10.	None
bis(2-Chloroethoxy)methane	10.	None	Fluoranthene	10.	None
2,4-Dichlorophenol	10.	None	Pyrene	10.	None
1,2,4-Trichlorobenzene	10.	None	Butylbenzylphthalate	10.	None
Naphthalene	10.	None	3,3'-Dichlorobenzidine	20.	None
4-Chloroaniline	10.	None	Benzo(a)anthracene	10.	None
Hexachlorobutadiene	10.	None	bis(2-Ethylhexyl)phthalate	10.	None
4-Chloro-3-methylphenol	10.	None	Chrysene	10.	None
2-Methylnaphthalene	10.	None	Di-n-octylphthalate	10.	None
Hexachlorocyclopentadiene	10.	None	Benzo(b)fluoranthene	10.	None
2,4,6-Trichlorophenol	10.	None	Benzo(k)fluoranthene	10.	None
2,4,5-Trichlorophenol	10.	None	Benzo(a)pyrene	10.	None
2-Chloronaphthalene	10.	None	Indeno(1,2,3-cd)pyrene	10.	None
2-Nitroaniline	50.	None	Dibenz(a,h)anthracene	10.	None
Dimethylphthalate	10.	None	Benzo(g,h,i)perylene	10.	None
Acenaphthylene	10.	None	N-Nitrosodimethylamine	10.	None
3-Nitroaniline	50.	None	1,2-Diphenylhydrazine	10.	None
Acenaphthene	10.	None	Benzidine	50.	None

Surrogates	Limits	% Rec	Surrogates	Limits	% Rec
Nitrobenzene-d5	35-114	81.	Phenol-d5	10-94	35.
2-Fluorobiphenyl	43-116	85.	2-Fluorophenol	21-100	47.
Terphenyl-d14	33-141	68.	2,4,6-Tribromophenol	10-123	92.

RECEIVED JUN 3 0 1989

IT ANALYTICAL SERVICES
SAN JOSE, CA

Client Project ID: 70878, Anania Geologic

Work Order Number: S9-06-158

Client Sample ID: 3209 (70878-12)

Sample Date: 6/7/89
Lab Sample ID: S9-06-158-05
Receipt Condition: Cool
Analysis Date: 6/20/89

Volatile Organics - E.P.A. Methods 624, 8240

Results - Micrograms per Liter

Parameter	Detection Limit	Detected	Parameter	Detection Limit	Detected
Chloromethane	10.	None	cis-1,3-Dichloropropene	5.	None
Bromomethane	10.	None	Trichloroethene	5.	None
Vinyl Chloride	10.	None	Chlorodibromomethane	5.	None
Chloroethane	10.	None	1,1,2-Trichloroethane	5.	None
Methylene Chloride	5.	None	Benzene	5.	None
Acetone	10.	None	trans-1,3-Dichloropropene	5.	None
Carbon Disulfide	5.	None	Bromoform	5.	None
1,1-Dichloroethene	5.	None	4-Methyl-2-pentanone	10.	None
1,1-Dichloroethane	5.	None	2-Hexanone	10.	None
1,2-Dichloroethene (Total)	5.	None	Tetrachloroethene	5.	None
Chloroform	5.	None	1,1,2,2-Tetrachloroethane	5.	None
1,2-Dichlorethane	5.	None	Toluene	5.	None
2-Butanone	10.	None	Chlorobenzene	5.	None
1,1,1-Trichloroethane	5.	None	Ethylbenzene	5.	None
Carbon Tetrachloride	5.	None	Styrene	5.	None
Vinyl Acetate	10.	None	Xylenes (Total)	5.	None
Bromodichloromethane	5.	None	Acrolein	10.	None
1,2-Dichloropropane	5.	None	Acrylonitrile	10.	None

Surrogates	Limits	% Rec
1,2-Dichloroethane-d4	76-114	104.
Toluene-d8	88-110	100.
4-Bromofluorobenzene	86-115	96.

RECEIVED JUN 3 0 1989

Date: June 28, 1989

IT ANALYTICAL SERVICES
SAN JOSE, CA

Client Project ID: 70878, Anania Geologic

Work Order Number: S9-06-158

Client Sample ID: 3209 (70878-12)

Sample Date: 6/7/89
Lab Sample ID: S9-06-158-05
Receipt Condition: Cool
Extraction Date: 6/14/89
Analysis Date: 6/22/89

Semi-Volatile Organics -E.P.A. Methods 625, 8270; Results - Micrograms per Liter

Parameter	Detection Limit	Detected	Parameter	Detection Limit	Detected
Phenol	10.	None	2,4-Dinitrophenol	50.	None
bis(2-Chloroethyl)ether	10.	None	4-Nitrophenol	50.	None
2-Chlorophenol	10.	None	Dibenzofuran	10.	None
1,3-Dichlorobenzene	10.	None	2,4-Dinitrotoluene	10.	None
1,4-Dichlorobenzene	10.	None	2,6-Dinitrotoluene	10.	None
Benzyl alcohol	10.	None	Diethylphthalate	10.	None
1,2-Dichlorobenzene	10.	None	4-Chlorophenylphenyl ether	10.	None
2-Methylphenol	10.	None	Fluorene	10.	None
bis(2-Chloroisopropyl)ether	10.	None	4-Nitroaniline	50.	None
4-Methylphenol	10.	None	4,6-Dinitro-o-cresol	50.	None
N-Nitroso-di-n-propylamine	10.	None	N-Nitrosodiphenylamine	10.	None
Hexachloroethane	10.	None	4-Bromophenylphenyl ether	10.	None
Nitrobenzene	10.	None	Hexachlorobenzene	10.	None
Isophorone	10.	None	Pentachlorophenol	50.	None
2-Nitrophenol	10.	None	Phenanthrene	10.	None
2,4-Dimethylphenol	10.	None	Anthracene	10.	None
Benzoic Acid	50.	None	Di-n-butylphthalate	10.	None
bis(2-Chloroethoxy)methane	10.	None	Fluoranthene	10.	None
2,4-Dichlorophenol	10.	None	Pyrene	10.	None
1,2,4-Trichlorobenzene	10.	None	Butylbenzylphthalate	10.	None
Naphthalene	10.	None	3,3'-Dichlorobenzidine	20.	None
4-Chloroaniline	10.	None	Benzo(a)anthracene	10.	None
Hexachlorobutadiene	10.	None	bis(2-Ethylhexyl)phthalate	10.	None
4-Chloro-3-methylphenol	10.	None	Chrysene	10.	None
2-Methylnaphthalene	10.	None	Di-n-octylphthalate	10.	None
Hexachlorocyclopentadiene	10.	None	Benzo(b)fluoranthene	10.	None
2,4,6-Trichlorophenol	10.	None	Benzo(k)fluoranthene	10.	None
2,4,5-Trichlorophenol	10.	None	Benzo(a)pyrene	10.	None
2-Chloronaphthalene	10.	None	Indeno(1,2,3-cd)pyrene	10.	None
2-Nitroaniline	50.	None	Dibenz(a,h)anthracene	10.	None
Dimethylphthalate	10.	None	Benzo(g,h,i)perylene	10.	None
Acenaphthylene	10.	None	N-Nitrosodimethylamine	10.	None
3-Nitroaniline	50.	None	1,2-Diphenylhydrazine	10.	None
Acenaphthene	10.	None	Benzidine	50.	None

Surrogates	Limits	% Rec	Surrogates	Limits	% Rec
Nitrobenzene-d5	35-114	73.	Phenol-d5	10-94	32.
2-Fluorobiphenyl	43-116	77.	2-Fluorophenol	21-100	42.
Terphenyl-d14	33-141	63.	2,4,6-Tribromophenol	10-123	88.

CHAIN OF CUSTODY RECORD

PROJ. NO. | SAMPLERS: (Signature)

PROJECT NAME AND ADDRESS:
Arsenic Geologic Engineering
11330 Sunrise Park Dr. Suite C
Rancho Cordova, CA. 95742

CROSS REFERENCE NUMBER	DATE	TIME	SOIL	WATER	STATION LOCATION	TOTAL PETROLEUM HYDROCARBONS	BTX	VOC-EPA 8240	TOTAL OIL & GREASE	5240	5210	REMARKS
4157				L	7C878-4					✓	✓	Send report to
4174				"	70878-6					✓	✓	Mary Scruggs
3197				"	70878-7					✓	✓	11330 Sunrise Park
4181				"	70878-10					✓	✓	Dr. Suite C
3209				"	70878-12					✓	✓	Rancho Cordova, CA
												95742

ANALYSIS REQUESTED

RELINQUISHED BY: (Signature)	DATE / TIME	RECEIVED BY: (Signature)	DATE / TIME
[signature]	DATE 6/13/91 TIME 1340	[signature]	DATE 6/13/91 TIME 1340
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