


**QUARTERLY GROUND WATER MONITORING
JULY 1990
OKADA PROPERTY
16109 ASHLAND AVENUE
SAN LEANDRO, CALIFORNIA**

BY

NSI TECHNOLOGY SERVICES CORPORATION

This report was prepared in accordance with the current procedures and guidelines established by the governing regulatory agency at that time.


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7/24/90
Date

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7/24/90
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TABLE OF CONTENTS

<u>Section</u>	<u>Page</u>
1.0 Introduction	1
1.1 Site History	1
1.2 Purpose and Scope	5
1.3 Site Description	6
2.0 Field Procedures	6
2.1 Wells Monitoring Procedure	6
2.2 Wells Sampling Procedure	7
3.0 Results	7
4.0 Recommendation	8

LIST OF TABLES

Table

- 1 Summary of Samples Results Due to Tanks Excavation.
- 2 Summary of Soil Sampling Results due to Soil Borings and Monitoring Wells Installation.
- 3 Summary of Ground Water Sampling Analysis Results.
- 4 Summary of Ground Water Table Elevations.
- 5 Summary of Ground Water Sampling Results for this Sampling Event.

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1.0 INTRODUCTION

This report summarizes the procedures and results of NSI Technology Services Corporation (NSI) sampling of the shallow ground water at the Okata property located at 16109 Ashland Avenue in San Leandro, California.

1.1 SITE HISTORY

The site was used as plants nursery since 1950. Prior to this time, the site was utilized for farming.

Information regarding the site history was provided by Citation Homes from Terrasearch, Inc. and Terratech, Inc. The history starts when Citations Homes started an environmental assessment for the property for a possible property transfer.

Terrasearch Inc., report No. E5999, dated February 10, 1990, for Environmental Testing Results documented the existence of two underground storage tanks (250-gallon gasoline tank and 3,000-gallon oil tank). On January 26, 1989, Terrasearch observed the tanks removal. The tanks removal was conducted by Ericson, Inc. Upon tank removal, each tank was visually examined. The gasoline tank showed no cracks or holes along the sides or the bottom of the tank. The oil tank revealed small holes in the bottom and a few small cracks along the sides. Ground water was encountered at a depth of 6.5 foot in the gasoline tank pit, and 7 to 7.5 feet in the oil tank pit.

One soil sample and one ground water sample were collected from the gasoline tank pit. Three soil samples and one ground water sample were collected from the oil tank pit. Laboratory results of the collected samples are as tabulated below in Table 1.

TABLE 1

Sample No.	Depth Ft	Lead	TPH-G	TPH-D	TOG	B	T	E	X
A- SOIL (Concentrations in Parts Per Million)									
Gas Tank									
7.5-8'	7.5-8.0'	20	N.D.	N/A.	N/A.	N.D.	N.D.	N.D.	N.D.
Oil Tank									
5.5-6'A	5.5-6.0'	22	28	4100	2000	N.D.	N.D.	0.1	0.4
5.5-6'B	5.5-6.0'	22	N.D.	220	1100	N.D.	N.D.	N.D.	N.D.
5.5-6'C	5.5-6.0'	13	N.D.	10	60	N.D.	N.D.	N.D.	N.D.

B- WATER (Concentrations in Parts Per Billion)

Gas Tank									
6.5-7'	6.5-7.0'	N.D.	740	N/A.	N/A.	N.D.	N.D.	2.0	3.0
Oil Tank									
7.5'	7.0'	N.D.	N/A.	60,000	44,000	N/A.	N/A.	N/A.	N/A.

LEGEND:

- TPH-G = Total Petroleum Hydrocarbons as Gasoline.
- TPH-D = Total Petroleum Hydrocarbons as Diesel.
- TOG = Total Oil and Grease.
- B = Benzene.
- T = Toluene.
- E = Ethylbenzene.
- X = Xylene.
- N.D. = Not Detected by Instrument Used for Analysis.
- N/A. = Not Analyzed.

Field observations of the gasoline tank pit indicated the presence of floating products which could artificially raised the concentrations of petroleum products in the ground water sample. Accordingly, on March 24, 1989, ground water from the bottom of the gasoline tank pit was pumped out and stored into a 55 gallon drum. Ground water was then allowed to accumulate in the excavation pit and was resampled on March 27, 1989. Analytical results of the second ground water sampling indicated concentration of Total Petroleum Hydrocarbons as gasoline (TPH-G) with Benzene, Toluene, Ethylbenzene, and Xylene (BTEX) compounds below the instrument detection limits.

However, due to high TPH as diesel and TOG concentration in the soil and ground water collected from the excavation pit, two 2-inch ground water monitoring well were installed by Terratech, Inc. (Project No. 4486, dated March 28, 1989). Monitoring well MW-1 was installed within 10 feet of the former oil tank, on the western side. MW-2 was installed approximately 100 feet southwest of the fuel oil tank area. Soil and ground water samples were collected with respect to monitoring wells installation. Soil and ground water analytical results are as tabulated below in Tables 2 and 3, respectively.

On March 30, 1989, Terrasearch installed three soil borings (EB1, EB2, and EB3) adjacent to the former fuel oil tank. Soil borings were drilled to a maximum depth of 20 feet. Analytical Results of the collected soil samples indicated low levels of TPH as diesel, see Table 2.

To determine the ground water flow direction in the site, on August 17, 1989, a third 2-inch monitoring well, MW-3, was installed by Terratech (Project 4486/1). Monitoring well MW-3 was installed next to the former gasoline tank. No TPH as gasoline or diesel was detected in any of the soil samples collected with respect to well installation except sample 5.5'. Soil sample collected at a depth of 5.5 foot indicated 30 ppm concentration of TPH as diesel. Sampling of monitoring well MW-3 indicated the presence of TPH as gasoline and diesel in the ground water below the instrument detection limit (N.D.). Results of laboratory testing of the soil samples are tabulated in Table 2, while water sample results are tabulated in Table 3.

On November 20, 1989, Terratech resampled all existing well as a start of the quarterly monitoring program. No TPH as gasoline, diesel, or BTEX compounds were found in the ground water samples for this sampling event.

On February 22, 1990, Terratech conducted the second quarterly sampling program. Traces of gasoline and diesel were found in the samples collected from MW-3. The quarterly sampling results are found in Table 3.

TABLE 2

Sample Location	Sample Depth Ft	TPH-G	TPH-D	B	T	E	X
--- All Concentrations in Parts Per Million ---							
Soil Samples Due to M. Wells Installation							
MW-1	5.5	N.D.	N.D.	0.0036	0.0055	0.0047	N.D.
	15.5	N.D.	N.D.	N.D.	0.28	0.024	0.21
	20.5	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
	25.5	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
MW-2	5.5	N.D.	N.D.	N.D.	0.0032	0.004	N.D.
	15.5	N.D.	N.D.	N.D.	0.0031	N.D.	N.D.
MW-3	5.5	N.D.	30	N.D.	N.D.	N.D.	N.D.
	10.5	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
	15.5	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Soil Samples Due to Soil Borings							
EB1.1	5	N/A.	2.5	N/A.	N/A.	N/A.	N/A.
EB1.2	10	N/A.	2.4	N/A.	N/A.	N/A.	N/A.
EB1.3	15	N/A.	3.9	N/A.	N/A.	N/A.	N/A.
EB2.1	5	N/A.	2.6	N/A.	N/A.	N/A.	N/A.
EB2.2	10	N/A.	3.0	N/A.	N/A.	N/A.	N/A.
EB2.3	15	N/A.	4.8	N/A.	N/A.	N/A.	N/A.
EB3.4	3	N/A.	3.1	N/A.	N/A.	N/A.	N/A.
EB3.1	5	N/A.	N.D.	N/A.	N/A.	N/A.	N/A.
EB3.2	10	N/A.	3.2	N/A.	N/A.	N/A.	N/A.
EB3.3	15	N/A.	3.0	N/A.	N/A.	N/A.	N/A.
LEGEND:							
TPH-G	=	Total Petroleum Hydrocarbons as Gasoline.					
TPH-D	=	Total Petroleum Hydrocarbons as Diesel.					
B	=	Benzene.					
T	=	Toluene.					
E	=	Ethylbenzene.					
X	=	Xylene.					
N.D.	=	Not Detected by Instrument Used for Analysis.					
N/A.	=	Not Analyzed.					

TABLE 3**SUMMARY OF GROUND WATER SAMPLING ANALYSIS RESULTS**

Sample Location	Date Sampled	TPH-G	TPH-D	B	T	E	X
--- All Concentrations in Parts Per Billion ---							
MW-1	03-31-89	<1000	<1000	0.4	1.8	<0.3	<0.3
	11-20-89	<50	<50	<0.5	<0.5	<0.5	<1.0
	02-22-90	<50	<50	<0.5	<0.5	<0.5	<1.0
MW-2	03-31-89	<1000	<1000	0.4	1.8	0.4	1.8
	11-20-89	<50	<50	<0.5	<0.5	<0.5	<1.0
	02-22-90	<50	<50	<0.5	<0.5	<0.5	<1.0
MW-3	08-21-89	<50	<50	<0.5	<0.5	<0.5	<1.0
	11-20-89	<50	80	<0.5	<0.5	<0.5	<1.0
	02-22-90	280	1100	<0.5	<0.5	<0.5	<1.0

LEGEND:

TPH-G = Total Petroleum Hydrocarbons as Gasoline.
 TPH-D = Total Petroleum Hydrocarbons as Diesel.
 B = Benzene.
 T = Toluene.
 E = Ethylbenzene.
 X = Xylene.

1.2 PURPOSE AND SCOPE

The purpose of this investigation was to continue the quarterly ground water monitoring for the presence of petroleum hydrocarbons due to the previously existed fuel tanks in the property.

Chemical analysis of the ground water samples from the three monitoring wells (MW-1 through MW-3) were conducted by Chromalab, Inc., at their certified environmental laboratory in San Ramon, California. All ground water samples were analyzed for Total Petroleum Hydrocarbons as Gasoline and Diesel (TPH-G and TPH-D) including Benzene, Toluene, Ethylbenzene, and Xylene (BTEX) following EPA test methods 5030/8015, 3550/8015, and 602, respectively.

Field activities and available information regarding chemical analysis results and conclusions are summarized below.

1.3 SITE DESCRIPTION

The site is located in the city of San Leandro on 16109 Ashland Avenue and consists of approximately 16 acres. The site is bounded on the southwest and northwest by housing and on the northeast by apartments complexes. The site is currently under construction, grading, and contains one oil tank fuel excavation pit.

2.0 FIELD PROCEDURES

2.1 WELLS MONITORING PROCEDURES

The ground water level in each monitoring well (MW-1 through MW-3) was measured by using a clean and predecontaminated stainless steel graduated tape, with attached sounding device. Water levels were recorded in the wells from the top of the casing to the nearest 0.01 foot. Table 4 lists water table levels in each well. It should be mentioned here that monitoring well MW-2 was damaged due to construction activities. Before sampling, the well casing was cut, repaired, and the locking end cap was replaced. Accordingly, the casing elevation of MW-2 need to be surveyed again.

TABLE 4

Well No.	Depth to Ground Water (Ft)
MW-1	7.81
MW-2	6.05
MW-3	8.56

When water level in each well was determined, a clean, dedicated and clear bailer was used to detect the presence of floating products in each well. Water discharge from each monitoring well was stored individually in sealed 55-gallon open head DOT-approved drums. The drums were then properly labeled and stored in the site.

Each well was purged with a clean and decontaminated nitrogen driven bladder pump. Field parameters, such as, pH, conductivity, temperature, visual turbidity, and color were observed. Field parameters and notes for each well are included in Appendix A.

2.2 WELLS SAMPLING PROCEDURES

Purging was terminated after more than 4 casing volumes of ground water were purged from each well and stabilization of pH, conductivity, and temperature was achieved. Depth to ground water in each well was then allowed to reach the original level, i. e., before pumping.

Water samples were collected using a stainless steel bailer tied with a nylon rope. The bailer and the rope were cleaned with a trisodium phosphate solution (TSP) with a triple rinse with deionized water before and after each use. Samples were collected in a 40-milliliter Volatile Organic Analysis (VOA) bottles fitted with teflon-lined screw type caps, and in one-liter amber bottles. The sample containers complied with the appropriate preservation techniques in reference to the LUFT manual, dated October 18, 1989. The samples were labeled, then placed in a cooler with ice, and sent to a State-certified laboratory, accompanied by the proper chain-of-custody records.

3.0 RESULTS

Ground water samples from all existing wells (MW-1 through MW-3) were sampled and analyzed for BTEX and TPH as gasoline and diesel. A hard copy of the analytical report as received from the laboratory attached with chain of custody records are enclosed in Appendix B.

All ground water samples indicated the presence of BTEX, TPH as gasoline and diesel at concentrations below the instrument detection limit. Table 5 summarizes the results of this sampling event.

TABLE 5

Sample Location	TPH-G	TPH-D	B	T	E	X
	---- All Concentrations in Parts Per Billion) ----					
MW-1	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
MW-2	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
MW-3	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.

LEGEND :

- TPH-G = Total Petroleum Hydrocarbons as Gasoline.
 - TPH-D = Total Petroleum Hydrocarbons as Diesel.
 - B = Benzene.
 - T = Toluene.
 - E = Ethylbenzene.
 - X = Xylene.
 - N.D. = Not Detected by Instrument Used for Analysis.
-

4.0 CONCLUSION

NSI Technology Services Corporation recommends the continuation of the quarterly monitoring for the monitoring wells in the site.

APPENDIX A

NSI Technology Services Corporation
Well Development and Water
Sampling Field Suvey

Project: Citation Homes Sampler: RASMI Date: 7/6/90

Well: MW-1 Site Name & Adress: 16109 Ashland Ave., San Leandro

Sampling Method: Nitrogen Driven Bladder Pump / Hand Bailer

Decontamination Procedure: Tripple Rinse with TSP Solution.

Well Development / well Sampling Data

Well Depth: 20' Time: Am Water Level Before Purging: 7.81'

Water Column		Casing Diameter 2-inch	4-inch	Volume (gallon)	Factor	Volume to Purge
<u>12.19</u>	feet X	<u>0.16</u>	0.65	<u>1.95</u>	<u>4</u>	<u>7.8 x 8 gallons</u>

Free Product Discription: _____

Elapsed Time (min)	Volume (gal)	pH	Conductivity (Micro-Siemens)	Temperature (°C)	Notes
<u>Start</u>	<u>0</u>	<u>6.85</u>	<u>1 x 10³</u>	<u>15.1</u>	<u>clear / No she or odor</u>
<u>5</u>	<u>2</u>	<u>6.70</u>	<u>1.3 x 10³</u>	<u>15.0</u>	
<u>5</u>	<u>4</u>	<u>6.93</u>	<u>1 x 10³</u>	<u>15.0</u>	
<u>7</u>	<u>6</u>	<u>7.10</u>	<u>.8 x 10³</u>	<u>15.0</u>	
<u>7</u>	<u>8</u>	<u>7.10</u>	<u>.8 x 10³</u>	<u>15.0</u>	

Water Table Allowed To Rize, _____

Water Table Level Before Sampling: 8.93'

NSI Technology Services Corporation.
Well Development and Water
Sampling Field Suvey

Project: Citation Homes Sampler: LAGMI Date: 7/9/90

Well: MW2 Site Name & Adress: 16109 Ashland Ave, San Leandro

Sampling Method: Nitrogen Driven Bladder Pump / Hand Bailer

Decontamination Procedure: Tripple Rinse with TSP Solution.

Well Development / well Sampling Data

Well Depth: 20 (ORIGINAL) Time: PM Water Level Before Purging: 0.05 * from New case after Rep

Water Column	Casing Diameter	Volume (gallon)	Factor	Volume to Purge
<u>13.95</u> feet X	<u>0.16</u>	<u>2.23</u>	<u>4</u>	<u>8.928</u> * 8 gallons.

Say 19ft after casing well

Free Product Discription: No product Present

Elapsed Time (min)	Volume (gal)	pH	Conductivity (Micro-Siemens)	Temperature (°C)	Notes
<u>Start</u>	<u>0</u>	<u>6.72</u>	<u>13 X 10³</u>	<u>14.5</u>	<u>clear / No odor</u>
<u>5</u>	<u>2</u>	<u>7.05</u>	<u>4 X 10³</u>	<u>14.4</u>	<u>?</u>
<u>7</u>	<u>4</u>	<u>7.0</u>	<u>0.8 X 10³</u>	<u>14.3</u>	<u>?</u>
<u>5</u>	<u>6</u>	<u>7.0</u>	<u>0.8 X 10³</u>	<u>14.3</u>	<u>?</u>
<u>8</u>	<u>8</u>	<u>7.0</u>	<u>0.8 X 10³</u>	<u>14.3</u>	<u>?</u>

Water Table Allowed To Rize,
 Water Table Level Before Sampling:

NSI Technology Services Corporation.
Well Development and Water
Sampling Field Suvey

Project: Citation Homes Sampler: RA Smi Date: 7/9/90
 Well: MW-3 Site Name & Adress: 16109 Ashland Ave, San Leandro
 Sampling Method: Nitrogen Driven Bladder Pump / Hand Bailer
 Decontamination Procedure: Tripple Rinse with TSP Solution.

Well Development / well Sampling Data

Well Depth: 20 Time: AM Water Level Before Purging: 8.56'

Water Column	Casing Diameter 2-inch	Casing Diameter 4-inch	Volume (gallon)	Factor	Volume to Purge
<u>11.44</u> feet X	<u>0.16</u>	<u>0.65</u>	<u>1.83</u>	<u>4</u>	<u>7.32 = 8 gal</u>

Free Product Discription: no product present

Elapsed Time (min)	Volume (gal)	pH	Conductivity (Micro-Siemens)	Temperature (°C)	Notes
<u>Start</u>	<u>0</u>	<u>6.80</u>	<u>8 x 10³</u>	<u>14.0</u>	<u>clear/wooden</u>
<u>10</u>	<u>4</u>	<u>7.10</u>	<u>4 x 10³</u>	<u>14.3</u>	<u>4</u>
<u>7</u>	<u>6</u>	<u>6.93</u>	<u>4 x 10³</u>	<u>14.4</u>	<u>4</u>
<u>5</u>	<u>7</u>	<u>7.0</u>	<u>4 x 10³</u>	<u>14.3</u>	<u>4</u>
<u>5</u>	<u>9</u>	<u>7.0</u>	<u>4 x 10³</u>	<u>14.3</u>	<u>4</u>

Water Table Allowed To Rize,
 Water Table Level Before Sampling: 9.34'

APPENDIX B

CHROMALAB, INC.

Analytical Laboratory
Specializing in GC-GC/MS

- Environmental Analysis
- Hazardous Waste (#E694)
- Drinking Water (#955)
- Waste Water
- Consultation

July 16, 1990

ChromaLab File No.: 0790045

NSI TECHNOLOGY SERVICES CORPORATION

Attn: Rasmi

RE: Three water samples for Gasoline/BTEX and Diesel analyses

Project Name: CITATION HOMES

Date Sampled: July 9, 1990

Date Submitted: July 9, 1990

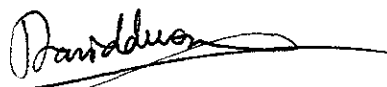
Date Extracted: July 11-14, 1990

Date Analyzed: July 11-14, 1990

RESULTS:

Sample No.	Gasoline (mg/L)	Diesel (mg/L)	Benzene (ug/L)	Toluene (ug/L)	Ethyl Benzene (ug/L)	Total Xylenes (ug/L)
MW-1	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
MW-2	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
MW-3	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
BLANK SPIKE	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
RECOVERY	97.1%	102.4%	91.6%	102.3%	111.0%	106.7%
DUP SPIKE						
RECOVERY	101.7%	86.0%	83.2%	86.5%	103.2%	93.1%
DETECTION						
LIMIT	0.5	0.5	0.5	0.5	0.5	0.5
METHOD OF ANALYSIS	5030/ 8015	3550/ 8015	602	602	602	602

ChromaLab, Inc.


David Duong
Senior Chemist


Eric Tam
Laboratory Director

NSI Technology Services Corporation

CHROMALAB FILE # 790045

A Subsidiary of
ManTech International Corporation
Commercial Environmental Services
155A Moffett Park Drive, Suite 220
Sunnyvale, CA 94089
Telephone (408) 745-6345
Facsimile (408) 747-1918

SAMPLE CHAIN OF CUSTODY

Survey #: _____
Collector: RASMI Date Sampled: 7/9/90 Time: AM
Sampling Location: _____
Project Name: Citation Homes Project Number: _____
Container Used: HOA + AMBER Bottles
Laboratory: CHROMA LAB

Sample ID	Type	Location	Analysis Requested
<u>MW-1</u>	<u>water</u>	<u>MW-1</u>	<u>TPH-G + BTEX + TPH-D</u>
<u>MW-2</u>	<u>"</u>	<u>MW-2</u>	<u>"</u>
<u>MW-3</u>	<u>"</u>	<u>MW-3</u>	<u>"</u>

Remarks: _____

Results Required By: NORMAL TURN AROUND

Travel Blank: YES NO
Duplicate Samples: YES NO
Field Blank: YES NO
Background Sample: YES NO

RELEASED BY: RASMI TIME: 3:30 PM DATE: 7/9/90
RECEIVED BY: [Signature] TIME: 3:30 PM DATE: 7/9/90

RELEASED BY: _____ TIME: _____ DATE: _____
RECEIVED BY: _____ TIME: _____ DATE: _____

RELEASED BY: _____ TIME: _____ DATE: _____
RECEIVED BY: _____ TIME: _____ DATE: _____

Send Results and Invoice To: NSI Technology Services Corporation
155A Moffett Park Drive
Suite 220
Sunnyvale, CA 94089
Attn: _____