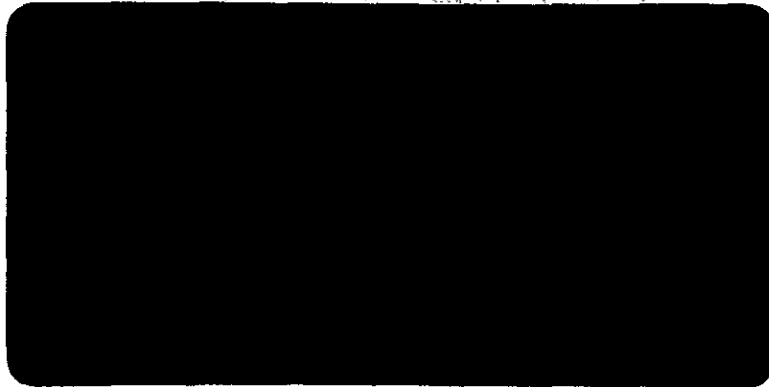


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TERRATECH, INC.

QUARTERLY GROUND WATER SAMPLING AND ANALYSIS
JANUARY 1992
CLARK'S HOME AND GARDEN
23040 CLAWITER ROAD
PROJECT 4983

For

Mr. Chester Clark
521 Triller Lane
Grants Pass, Oregon 97527

By

Terratech, Inc.
1365 Vander Way
San Jose, California 95112

February 26, 1992



QUARTERLY GROUND WATER SAMPLING AND ANALYSIS
JANUARY 1992
CLARK'S HOME & GARDEN
23040 CLAWITER ROAD
HAYWARD, CALIFORNIA

PROJECT 4983

INTRODUCTION

This report describes the work performed for and the findings from Terratech's recent quarterly testing of the shallow ground water at 23040 Clawiter Road in Hayward (see Figures 1 and 2). The work is being performed according to requirements of the Alameda County Health Agency (ACHA) for follow-up to a fuel leak discovered when two underground storage tanks were removed from the site in 1988.

Background information on this project is presented in Terratech's Project 4983 reports, "Initial Investigation of Ground Water Contamination, ...," dated September 5, 1991, and "Follow-up Ground Water Testing, ...," dated November 12, 1991.

WORK PERFORMED

On January 7, 1992 a member of Terratech's environmental department performed the quarterly sampling of on-site monitoring well MW-1. The depth to standing water in the well was first measured using an electronic probe. The well was then purged using a pre-cleaned Teflon bailer. During purging, temperature, pH and specific conductance measurements were taken until stable (< 10% variation) readings were obtained. Approximately four well-volumes of water were removed from MW-1 prior to collecting a sample. Purged water was placed into a labeled drum and left on site.

The sample from MW-1 was collected in a set of three 40-ml volatile organic analysis (VOA) vials, and a pair of 1-liter amber jars supplied by the testing laboratory. The VOA vials, which contained a small amount of hydrochloric acid preservative, were filled to a positive meniscus and sealed with a Teflon septum screw cap. The containers were then inverted and tapped to confirm the absence of headspace or bubbles, then immediately labeled and iced. The amber jars were filled, capped labeled and iced.

The sample containers were kept iced or refrigerated from the time of collection until the time of analysis. Standard chain of custody records, which document the sample collection, handling and analytical requests, are presented in the Appendix.



The ground water sample was analyzed by NET Pacific, a state-certified laboratory in Santa Rosa, for total petroleum hydrocarbons (TPH) as diesel using EPA Method 3510 extraction and GC-FID detection; TPH as gasoline using EPA Method 5030 with GC-FID detection; and the specific fuel compounds - benzene, toluene, ethylbenzene and xylenes (BTEX) using a modified EPA Method 8020.

FINDINGS AND COMMENTS

Ground Water Conditions

The on-site ground water level rose approximately 0.69 feet during the period between the October 15, 1991 and January 7, 1992 sampling events. Table 1 presents a summary of ground water level measurements in MW-1 to date. Based on previously reviewed regulatory information on surrounding fuel leak sites, the local ground water gradient direction is expected to be toward the west.

A prominent fuel odor and surface sheen on purged water were noticed by our sampling technician during the recent sampling activities.

January 1992 laboratory analyses of the MW-1 ground water sample detected 23,000 parts per billion (ppb) of TPH as gasoline, 9,000 ppb of TPH as diesel, and elevated ethylbenzene and xylenes. The compound detected as gasoline was reported by the analytical laboratory as not appearing to have a typical gasoline pattern on gas chromatogram printouts. Furthermore, the petroleum quantitated as diesel is reportedly due to both diesel and a lighter hydrocarbon. A laboratory chemist informed us that the light hydrocarbon associated with the diesel could be kerosene, however neither of the atypical patterns was positively identified.

Ground water sample analyses results to date are summarized in Table 2. The January 1992 laboratory report and corresponding chain of custody record are appended.

COMMENTS

Our follow-up observations and laboratory analyses confirm that a fuel impact persists in the shallow ground water beneath the subject site. The impact appears to be from a mixture of gasoline, diesel, and possibly one or more presently unidentified petroleum fuels.

In a December 27, 1991 letter to Mr. Clark, Pamela Evans of the ACHA recommended incorporating existing off-site monitoring wells into our sampling program. To investigate the relevance of off-site wells for this project, we recommend the following 3-step approach be used in our next sampling event:



February 26, 1992

Project 4983

-Establish common survey datum for chosen neighborhood monitoring wells, splitting the survey cost among pertinent responsible parties (RPs). (The targeted sites are presently in the regulatory jurisdiction of either the Hayward Fire Department or the ACHA.) Plot the well and ground water elevation data on a vicinity map.

-Coordinate a time for common ground water sampling, with each RP paying their own consultant for sampling labor.

-Obtain analytical services from a laboratory agreed upon by all sampling parties, with each RP paying their own laboratory fees.

[NOTE: The December 27, 1991 ACHA letter states that "TPHg levels have been detected (on site) as high as 47,000 *parts per million*." We would like to correct this statement by emphasizing levels up to 47,000 parts per billion TPHg (equivalent to 47 parts per million) have been detected.]

To maintain our established quarterly sampling schedule, we recommend proceeding with surveying and ground water monitoring coordination as soon as possible.

LIMITATIONS


This report and the associated work have been provided in accordance with the general principles and practices currently employed in the environmental consulting profession. This is in lieu of all warranties, express or implied. Our sampling and testing program is necessarily limited.

Report Prepared by:

TERRATECH, INC.


Shiela M. Chrisley
Project Environmental Geologist

Reviewed by:


Eric R. Lautenbach
CE 42437



Attachments (Vicinity Map, Site Plan, Chain of Custody Record and Laboratory Report)

cc: Ms. Pamela Evans - Alameda County Health Care Agency
Mr. Eddy So - Regional Water Quality Control Board
Mr. Hugh Murphy - Hayward Fire Department
Mr. Butch Voss - L.H. Voss Materials, Inc.
Mr. Bob Price



TABLE 1	
SUMMARY OF GROUND WATER DEPTH MEASUREMENTS	
Clark's Home and Garden Center 23040 Clawiter Road Hayward, California	
Location and Date	Depth to Ground Water (feet)
MW-1	
08/07/91	17.44
09/05/91	17.72
10/15/91	17.92
01/07/92	17.23



TABLE 2

SUMMARY OF GROUND WATER SAMPLE ANALYSIS RESULTS

Clark's Home and Garden Center
23040 Clawiter Road
Hayward, California

(Concentrations are in parts per billion (ppb))

Sample Location and Date	TPH as Diesel	TPH as Gasoline	Benzene	Toluene	Ethyl-benzene	Xylenes
MW-1						
08/07/91	7,100	5,900	45	<25	130	520
09/05/91	2,800*	47,000	<50	<50	230	660
10/15/91	13,000	24,000	<50	<50	<50	390
01/07/92	9,000*	23,000**	<50	<50	270	800
Action Level/MCL	--	--	1	100	680	1,750

NOTES:

TPH = Total petroleum hydrocarbons

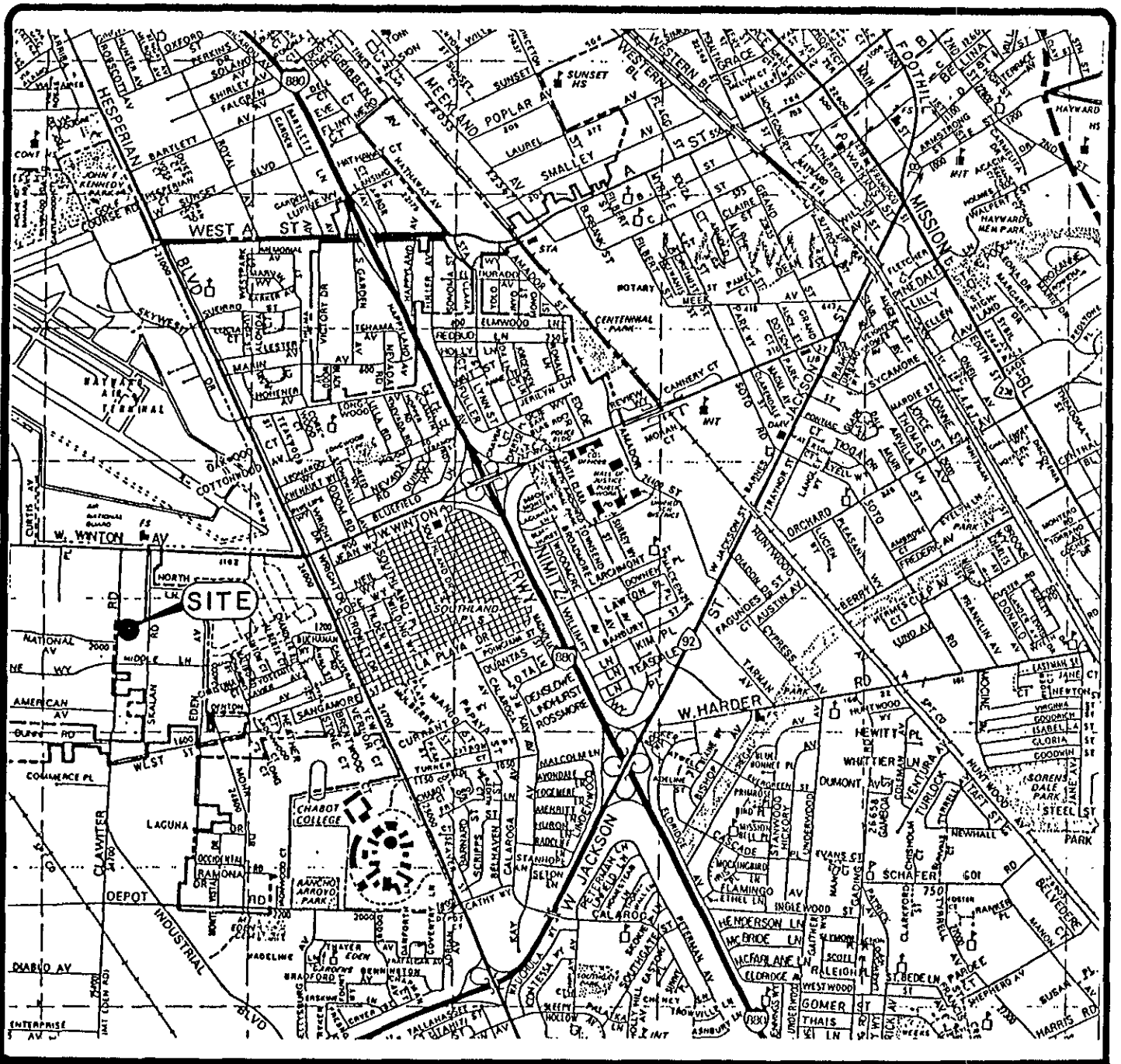
*Laboratory notes that petroleum hydrocarbon detected as diesel is due to both diesel and a petroleum hydrocarbon lighter than diesel.

**Laboratory notes that petroleum hydrocarbon detected as gasoline does not appear to have a typical gasoline pattern.

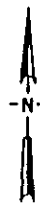
Action Levels and Maximum Contaminant Levels (MCL) are for contaminants in drinking water, as established by the California Department of Health Services.

-- = Action Level or MCL not established for TPH in drinking water. Clean-up guidelines are established on a site-specific basis.





BASE MAP: Thomas Brothers Maps; Alameda County
1990 edition; p. 58.

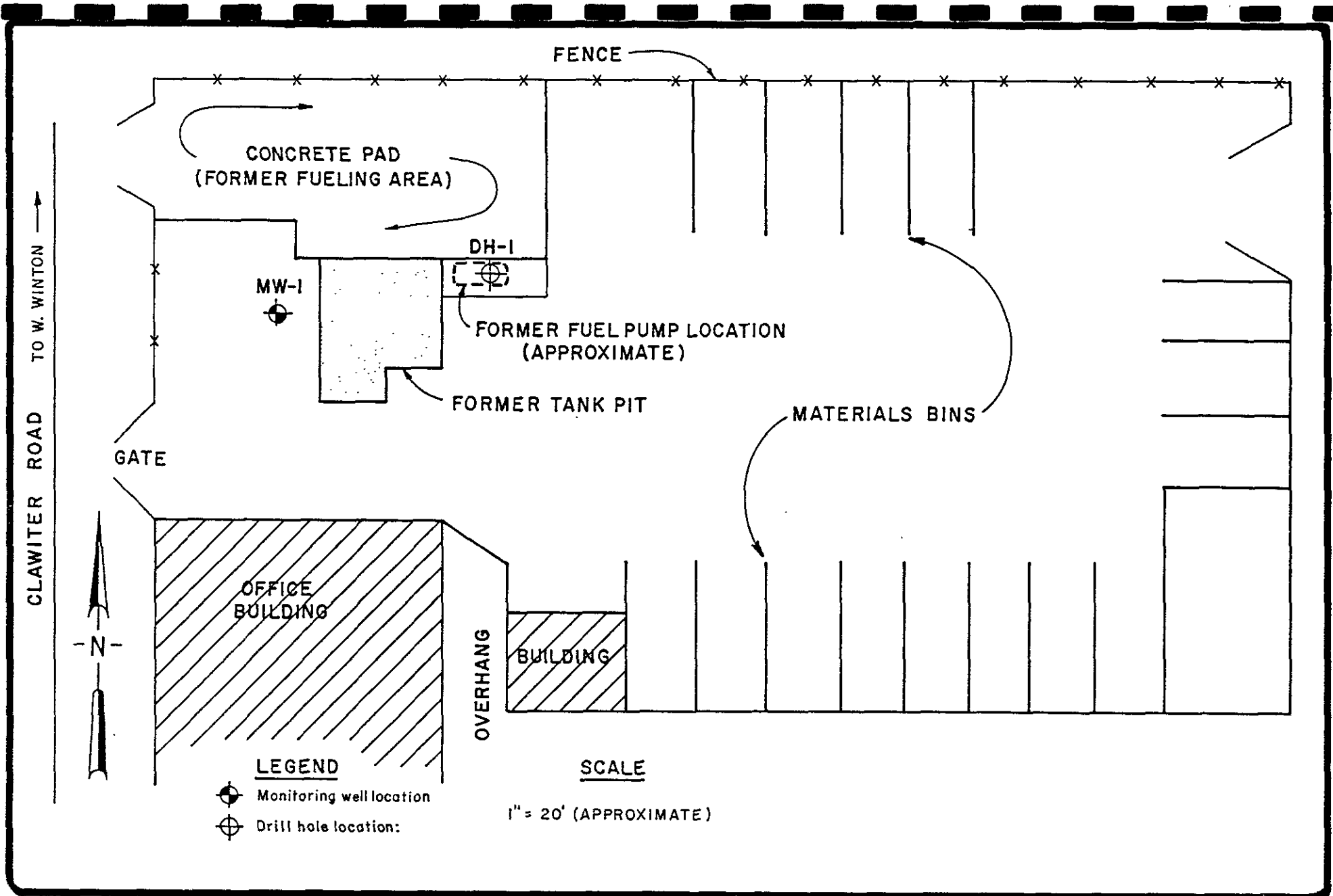


AUG. 1991
TERRATECH

CLARK'S HOME AND GARDEN
23040 CLAWITER ROAD
HAYWARD, CALIFORNIA

SITE VICINITY MAP

FIGURE
1
PROJECT
4983




AUG. 1991
TERRATECH

CLARK'S HOME AND GARDEN
 23040 CLAWWATER ROAD
 HAYWARD, CALIFORNIA

SITE PLAN

FIGURE
 2
 PROJECT
 4983

APPENDIX

**Laboratory Report
and
Chain of Custody**



TERRATECH

CHAIN OF CUSTODY RECORD

P.O. NO. 5515

3/9/91

TURNAROUND: 10-day

PROJECT NUMBER: <u>4983</u>					Number of Containers	Analysis Required TPH as Gasoline BTX TPH as Diesel	REMARKS	SAMPLE DEPTH	
SAMPLERS (signature): <u>Robert E. Baker</u>									
Station Number	Date	Time	Comp.	Grab	Station Location				
MW-1	1-7			X	West of former fuel tanks	3-4000 VOLS	X	X	VOLs w/ACQ pres.
↓	↓			X	" " "	2-liter BUNDLES		X	
CUSTODY SEALED 1/8/92									
@ 1900 MW1 seal intact									
Relinquished by (signature): <u>Bob Baker</u>			Date / Time: <u>1/7/92</u>		Received by (signature): <u>Frank Groffie</u>		Date / Time: <u>1-8-92</u>		Received by (signature): <u>[Signature]</u>
Company or Agency: <u>TERRATECH, INC.</u>			<u>5PM</u>		Company or Agency: <u>ITT 1-7-92 1700</u>		<u>0900</u>		Company or Agency: <u>Terratech, Inc.</u>
Relinquished by (signature): <u>[Signature]</u>			Date / Time: <u>1-8-92</u>		Received by (signature): <u>Mike Tawau</u>		Date / Time: <u>1/8/92</u>		Received by (signature): <u>[Signature]</u>
Company or Agency: <u>TERRATECH, INC.</u>			<u>1115</u>		Company or Agency: <u>NET</u>		<u>1900</u>		Company or Agency: <u>NET</u>
Relinquished by (signature): <u>[Signature]</u>			Date / Time: <u>1/9/92</u>		Received for Laboratory by: (signature) <u>[Signature]</u>		Date / Time: <u>0800</u>		Remarks/Shipping Information: <u>Send reports to: Sheila Christy</u>
Company or Agency: <u>TERRATECH, INC.</u>			<u>1115</u>				<u>1/9/92</u>		<u>1365 VANDER WAY, SAN JOSE 95112</u>

NET



®

NATIONAL
ENVIRONMENTAL
TESTING, INC.

NET Pacific, Inc.
435 Tesconi Circle
Santa Rosa, CA 95401
Tel: (707) 526-7200
Fax: (707) 526-9623

Shiela Chrisley
Terratech
1365 Vander Way
San Jose, CA 95112

Date: 01/28/1992
NET Client Acct. No: 70400
NET Pacific Log No: 92.0050
Received: 01/09/1992

Client Reference Information

Project: 4983

Sample analysis in support of the project referenced above has been completed and results are presented on following pages. Please refer to the enclosed "Key to Abbreviations" for definition of terms. Should you have questions regarding procedures or results, please feel welcome to contact Client Services.

Approved by:

TERRATECH, INC.

FEB 3 1992

RECEIVED


Jules Skamarack
Laboratory Manager

Enclosure(s)



Client Acct: 70400
 Client Name: Terratech
 NET Log No: 92.0050

Date: 01/28/1992
 Page: 2

NET Pacific, Inc.

Ref: Project: 4983

SAMPLE DESCRIPTION: MW-1
 Date Taken: 01/07/1992
 Time Taken:
 LAB Job No: (-110621)

Parameter	Method	Reporting Limit	Results	Units
TPH (Gas/BTXE,Liquid)			--	
METHOD 5030 (GC,FID)			01-14-92	
DATE ANALYZED			100	
DILUTION FACTOR*			23**	mg/L
as Gasoline	5030	0.05		
METHOD 8020 (GC,Liquid)			--	
DATE ANALYZED			01-14-92	
DILUTION FACTOR*			100	
Benzene	8020	0.5	ND	ug/L
Ethylbenzene	8020	0.5	270	ug/L
Toluene	8020	0.5	ND	ug/L
Xylenes (Total)	8020	0.5	800	ug/L
METHOD 3510 (GC,FID)			5	
DILUTION FACTOR*			01-14-92	
DATE EXTRACTED			01-19-92	
DATE ANALYZED			9.0***	mg/L
as Diesel	3510	0.05		
as Motor Oil	3510	0.5	ND	mg/L

** Positive response for Petroleum Hydrocarbons as Gasoline does not appear to have a typical Gasoline pattern.

*** Positive response for Petroleum Hydrocarbons as Diesel appears to be due to a both Diesel and lighter hydrocarbons.



Client Acct: 70400
Client Name: Terratech
NET Log No: 92.0050

Date: 01/28/1992
Page: 3

NET Pacific, Inc.

Ref: Project: 4983

QUALITY CONTROL DATA

Parameter	Reporting Limits	Units	Cal Verf Stand % Recovery	Blank Data	Spike % Recovery	Duplicate Spike % Recovery	RPD
Gasoline	0.05	mg/L	97	ND	78	93	17
Benzene	0.5	ug/L	85	ND	80	91	13
Toluene	0.5	ug/L	98	ND	80	93	15
Diesel	0.05	mg/L	92	ND	71	73	1.8
Motor Oil	0.5	mg/L	97	ND	N/A	N/A	N/A

COMMENT: Blank Results were ND on other analytes tested.



KEY TO ABBREVIATIONS and METHOD REFERENCES

NET Pacific, Inc

- < : Less than; When appearing in results column indicates analyte not detected at the value following. This datum supercedes the listed Reporting Limit.
- * : Reporting Limits are a function of the dilution factor for any given sample. To obtain the actual reporting limits for this sample, multiply the stated Reporting Limits by the dilution factor (but do not multiply reported values):
- ICVS : Initial Calibration Verification Standard (External Standard).
- mean : Average; sum of measurements divided by number of measurements.
- mg/Kg (ppm) : Concentration in units of milligrams of analyte per kilogram of sample, wet-weight basis (parts per million).
- mg/L : Concentration in units of milligrams of analyte per liter of sample.
- mL/L/hr : Milliliters per liter per hour.
- MPN/100 mL : Most probable number of bacteria per one hundred milliliters of sample.
- N/A : Not applicable.
- NA : Not analyzed.
- ND : Not detected; the analyte concentration is less than applicable listed reporting limit.
- NTU : Nephelometric turbidity units.
- RPD : Relative percent difference, $100 \text{ [Value 1 - Value 2] / mean value}$.
- SNA : Standard not available.
- ug/Kg (ppb) : Concentration in units of micrograms of analyte per kilogram of sample, wet-weight basis (parts per billion).
- ug/L : Concentration in units of micrograms of analyte per liter of sample.
- umhos/cm : Micromhos per centimeter.

Method References

Methods 100 through 493: see "Methods for Chemical Analysis of Water & Wastes", U.S. EPA, 600/4-79-020, rev. 1983.

Methods 601 through 625: see "Guidelines Establishing Test Procedures for the Analysis of Pollutants" U.S. EPA, 40 CFR, Part 136, rev. 1988.

Methods 1000 through 9999: see "Test Methods for Evaluating Solid Waste", U.S. EPA SW-846, 3rd edition, 1986.

SM: see "Standard Methods for the Examination of Water & Wastewater, 16th Edition, APHA, 1985.