

WEST
ASSOCIATES
ENVIRONMENTAL ENGINEERS, INC.

March 25, 1997

Alameda County Health Care Services Agency
Department of Environmental Health
1131 Harbor Bay Parkway, Suite 250
Alameda, CA 94502-6577
Attn: Ms. Juliet Shin
Hazardous Materials Specialist

SUBJECT: SUBMITTAL OF QUARTERLY GROUNDWATER MONITORING REPORT,
WEYERHAEUSER PAPER COMPANY, ALAMEDA CORRUGATED BOX FACILITY,
1801 HIBBARD STR., STID 1202

Dear Ms. Shin,

West & Associates Environmental Engineers, Inc. respectfully submits the first quarter 1997 groundwater monitoring report for the Weyerhaeuser Paper Company, Alameda Corrugated Box Facility. The monitoring report is submitted in accordance with the interim groundwater monitoring plan proposed in our Site Investigation Report of January 1995.

Groundwater samples were analyzed in accordance with the new analytical schedule defined in your May 14, 1996 response letter.

We look forward to your review of the attached report. Should you require any additional information please contact me at (707) 451-1360.

Yours truly,



Brennan Mahoney APSS
Project Manager
West & Associates Environmental Engineers, Inc.

Enclosure: Groundwater Monitoring Report

cc: Ed Granados, Weyerhaeuser Office of the Environment, Tacoma
John Hipner, WPC Alameda

QUARTERLY GROUNDWATER MONITORING REPORT
FORMER UNDERGROUND TANK SITES
JANUARY - MARCH 1997

WEYERHAEUSER PAPER COMPANY
ALAMEDA CORRUGATED BOX FACILITY
1801 Hibbard Street
Alameda, California
STID 1202

Submitted to:

ALAMEDA COUNTY
HEALTH CARE SERVICES AGENCY
DEPARTMENT OF ENVIRONMENTAL HEALTH
Alameda

Prepared for:

THE WEYERHAEUSER CORPORATION
OFFICE OF THE ENVIRONMENT
TOXIC/SOLID WASTE TEAM
Tacoma, Washington

Prepared by:

WEST & ASSOCIATES ENVIRONMENTAL ENGINEERS, INC.
Vacaville

March 1997

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EXECUTIVE SUMMARY

The Weyerhaeuser Paper Company (WPC) Alameda containerboard facility, at 1801 Hibbard Str., is a corrugated box manufacturing plant. The facility was originally constructed in 1946. Underground fuel tanks had been historically installed at the facility for vehicle, generator and boiler fuel storage. Both gasoline and diesel fuels were formerly stored underground. The last remaining underground tank was removed from the WPC site in January 1994.

The WPC facility is located on Alameda island in San Francisco Bay. The site is less than 0.25 miles west of the Oakland Inner Harbor. Site soils are predominantly sand with minor clay stringers. Unconfined groundwater is 3-6 feet below ground surface and tidally influenced.

There are two separate groundwater study areas at the WPC Alameda site. A former diesel tank site is monitored by one groundwater well (MW-7) on the east side of the property. A former gasoline tank cluster is monitored by seven monitoring wells on west side of the property. Monitoring wells MW-1 through MW-7 were installed by Soil Tech Engineers. Monitoring wells MW-9 through MW-12, MW-3B and MW-4B were installed by West & Associates.

Site investigation at the WPC Alameda facility was concluded in January 1995 with the submittal of a comprehensive report covering all work dating back to 1990. Activity at the site has now shifted to remedial action. In October and November of 1995 contaminated soil was excavated from the site around the former gasoline tank cluster and air sparging lines were installed in the open excavations prior to backfill. A pilot test was performed to evaluate the effectiveness of the newly installed sparging system. Based on results of the pilot test, continuous operation of the sparging system was initiated on March 29, 1996.

During the remedial excavation program monitoring wells MW-1, MW-2, MW-3, MW-4 and MW-9 were removed. In December 1995 two new wells MW-3B and MW-4B were installed in two locations within the newly backfilled excavation area, near the former locations of MW-3 and MW-4, respectively. A total of eight monitoring wells now exist at the site.

A groundwater monitoring program is in effect at the WPC Alameda site. Groundwater monitoring, which consists of depth to groundwater measurements and collection of groundwater samples for chemical analysis, is conducted quarterly. First quarter groundwater monitoring activities for 1997 were conducted on February 13, 1997.

In correspondence dated May 14, 1996, the Alameda County, Environmental Health Services Department approved a modified analytical schedule proposed by West & Associates in the March 1996 Quarterly Groundwater Monitoring Report. The frequency of EPA Method 624 and 625 analysis for groundwater samples has been revised from quarterly to semi-annual. Selected groundwater samples were analyzed by EPA Method 624 and 625 this quarter.

ACKNOWLEDGEMENTS

This report was prepared under authorization of the Weyerhaeuser Corporation, Office of the Environment, Toxic/Solid Waste Team, Tacoma, Washington. The Weyerhaeuser project officer is Mr. Ed Granados, mail stop CH 1K29, Tacoma, WA 98477; (206) 924-6511.

At the WPC plant, both Mr. John Hipner, Plant Engineer and Mr. Tom Muncell, Maintenance Manager, have environmental compliance responsibilities related to this project. The Alameda plant address is 1801 Hibbard Street, PO Drawer X, Alameda, CA 95601; (510) 814-1167.

The lead regulatory agency for the Weyerhaeuser Alameda plant is the Alameda County Health Care Agency, Department of Environmental Health. Ms. Juliet Shin, Hazardous Materials Specialist, is the staff person assigned. The Department of Environmental Health is located at 1131 Harbor Bay Parkway, Suite 250, Alameda, CA 94502-6577; (510) 567-6763.

In the preparation of this quarterly report reliance was made on past site work performed by Soil Tech Engineering, Inc. Soil Tech Engineering is located at 298 Brokaw Road, Santa Clara, CA 95050; (408) 496-0265.

Analytical work performed for this quarters monitoring was sub-contracted to Anlab Analytical Laboratory located in Sacramento, California. Anlab is certified by the State Department of Health Services for the analyses performed.

This quarterly groundwater monitoring report was prepared by West & Associates Environmental Engineers, Inc. West & Associates is located at 490 Merchant St., Suite 104, Vacaville, CA 95688; mailing address, PO Box 5891, Vacaville 95696; (707) 451-1360. Principal authors are Mr. Brennan Mahoney APSS and Mr. Brian W. West PE. (Registered California Civil Engineer No. 32319 - expires 12/31/00).



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1.0 INTRODUCTION

Groundwater conditions are periodically monitored at the Weyerhaeuser Paper Company Alameda Containerboard plant based on a schedule proposed to the Alameda County Environmental Health Agency in January 1995 (and amended in May 1996). This report presents results of groundwater monitoring performed during the first quarter (January - March) of 1997.

This quarter, groundwater monitoring was performed on February 13, 1997. During groundwater sampling activities, all eight of the existing monitoring wells were inspected for the presence of floating product, measured for depth to groundwater and samples collected for chemical analysis.

In the following Sections, monitoring procedures are described, monitoring data is summarized and a discussion of results is presented. Technical data is included in the appendix.

1.1 Scope

The scope of this project included performing quarterly groundwater monitoring at Weyerhaeuser Paper Company (WPC) Alameda property, 1801 Hibbard Str., in Alameda. Figure 1 illustrates the WPC Alameda regional setting. Figure 2 depicts the site location. Specific scope items include:

- Check eight existing monitoring wells for floating product
- Measure depth to groundwater in all monitoring wells
- Determine the groundwater gradient profile
- Collect groundwater samples from all eight monitoring wells
- Analyze groundwater samples for contaminants of interest
- Prepare a written report of findings
- Properly manage sampling residues

1.2 Summarized Background

The Weyerhaeuser Paper Company (WPC) Alameda facility located at 1801 Hibbard Str. manufactures corrugated cardboard boxes. The facility was originally constructed in 1946. Underground fuel tanks (UGT) had been historically installed at the facility for vehicle, generator and boiler fuel storage. Both gasoline and diesel fuels were formerly stored. The last remaining UGT was removed from the WPC site in January 1994.

At the end of 1990 the WPC facility was equipped with five underground fuel storage tanks. The five tanks were distributed in three separate installations located along the northwestern side of the facility.

In early 1991 Weyerhaeuser removed a cluster of three, 1,000 gallon gasoline tanks and one, 10,000 gallon diesel tank. Upon removal, the 10,000 gallon diesel tank installation was found to be virtually uncontaminated, however, significant soil and groundwater contamination was encountered at the gasoline tank cluster location.

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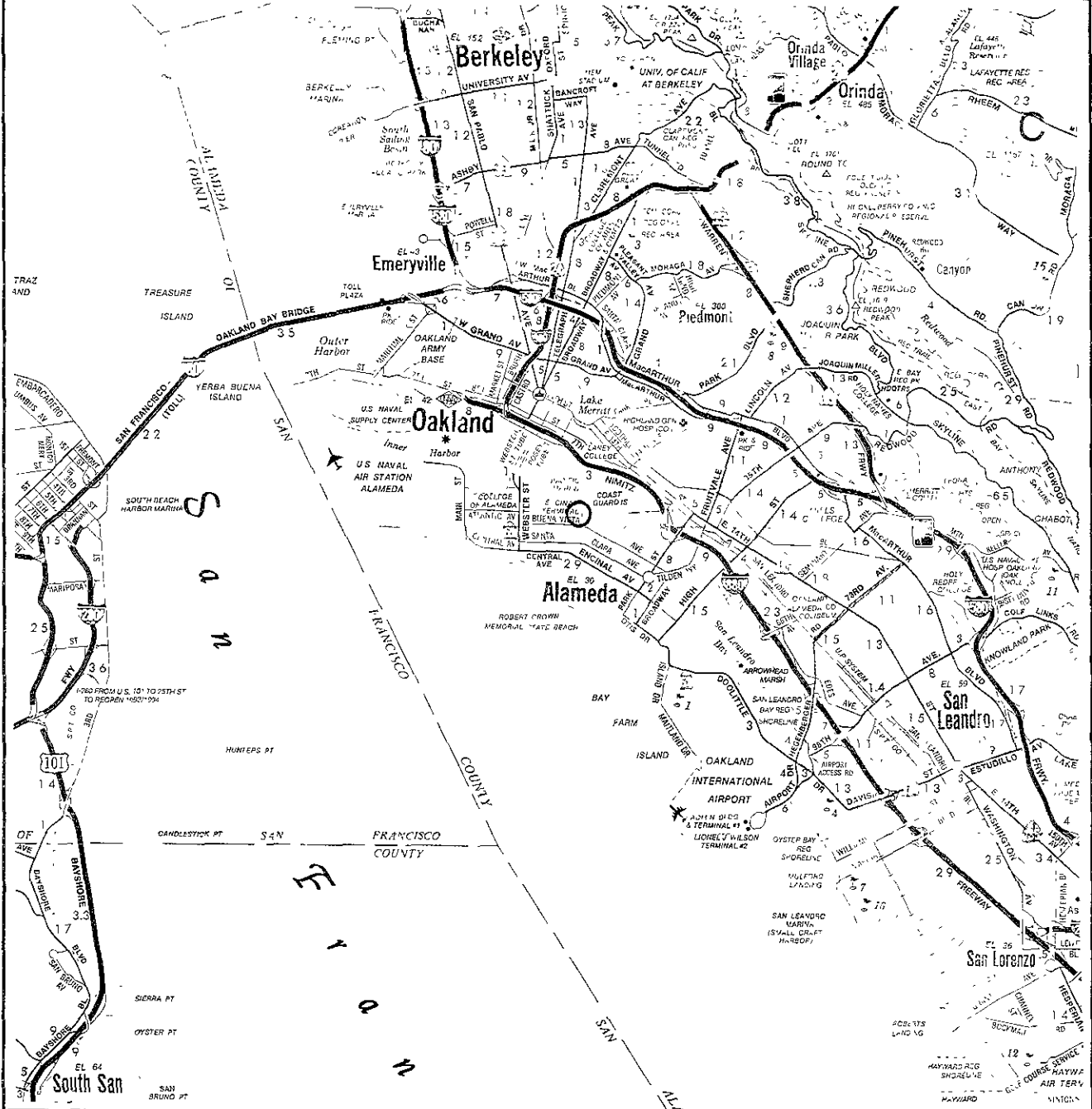
Project Name: Weyerhaeuser Paper Company - Alameda

Date: Jan. 1995

Location: 1801 Hibbard Str., Alameda, California 94501

Drawing By: BWW

Scale: 1" = 2.5 miles



LEGEND

WPC ALAMEDA FACILITY - REGIONAL SETTING
○ SITE LOCATION

Figure 1

WEST & ASSOCIATES ENVIRONMENTAL ENGINEERS, INC.

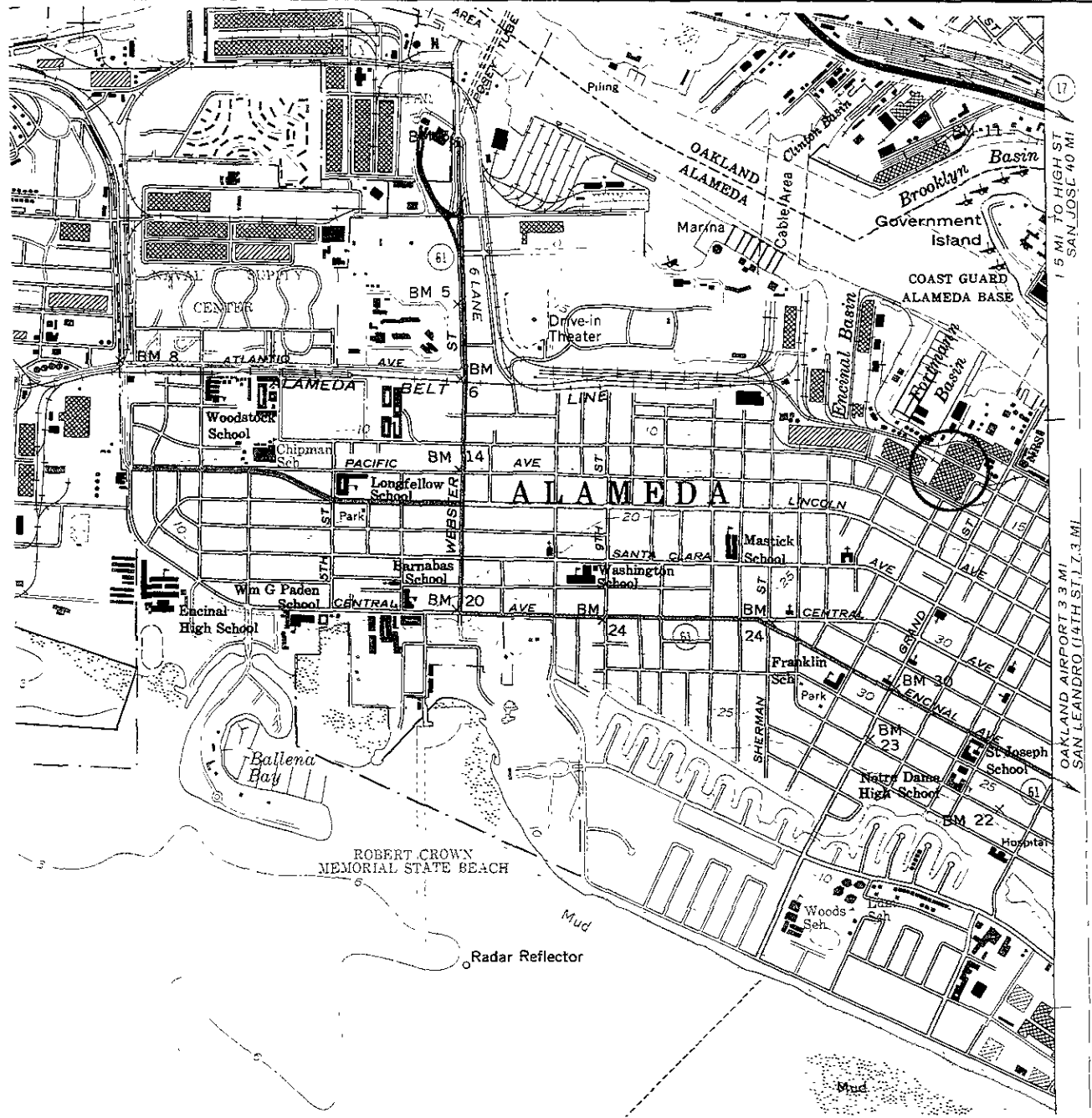
PO Box 5891, Vacaville, California 95696

Project Name: Weyerhaeuser Paper Company - Alameda Date: Jan. 1995

Location: 1801 Hibbard Str., Alameda, California 94501

Drawing By: BWB

Scale: 1" = 0.4 Miles



LEGEND

Figure 2

WPC ALAMEDA FACILITY - SITE LOCATION

○ SITE LOCATION

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The tank removal contractor performed overexcavation at the gasoline tank cluster location in an attempt to remediate soil contamination. Between February and April 1991 the tank excavation was enlarged from 460 ft² to 640 ft² and then to 930 ft².

Four soil samples were collected from the gasoline tank cluster pit sidewalls at the conclusion of overexcavation. Only one endpoint sidewall soil sample (Sample No. 11) was non-detectable for all tested chemical constituents. One of the sidewall soil samples (Sample No. 9) was found to contain only trace levels of toluene. The other two endpoint soil samples (Sample No.'s 8 & 10), were found to contain low levels of TPH and BTXE compounds.

During the time the gasoline tank cluster excavation was open, the standing groundwater level in the pit was observed to rise from greater than 8 feet to less than 4 feet below ground surface. The file record indicates endpoint soil samples were collected from higher on the pit sidewalls as the water level rose.

Both the gasoline tank cluster and diesel tank excavations were backfilled with clean fill. Contaminated soil was transported to off-site disposal.

In December 1991 and again in April 1992, Soil Tech Engineering performed soils and groundwater investigations near the former gasoline tank cluster. A total of six groundwater monitoring wells were installed. Soil samples for laboratory analysis were collected during monitoring well installation. Between December 1991 and July 1993 Soil Tech performed groundwater monitoring on six occasions.

In December 1992, Soil Tech constructed one monitoring well (MW-7) adjacent to the former underground diesel tank, increasing the total number of site wells to seven. STE monitored MW-7 a total of 3 times.

Soil Tech's investigations revealed significant remaining soil contamination as well as widespread groundwater contamination in the vicinity of the former gasoline tank cluster. The six soil borings and monitoring wells completed by STE did not fully define the total extent of either soil or groundwater contamination around the former gasoline tank cluster.

In January 1994 the last remaining underground fuel storage tank, (20,000 gallon diesel) was removed from the WPC property. No evidence of any leakage from the diesel tank was encountered, however, soil contamination from the 1991 gasoline tank cluster was observed on the east sidewall of the diesel tank pit.

West & Associates Environmental Engineers submitted a proposed workplan for additional site investigation to the Alameda County Health Care Agency in November 1993. Site investigations were performed in January and February 1994. In May 1994 a supplemental workplan was submitted to conduct further investigation under the main plant building. In June 1994 an interim report of findings was submitted and in October 1994

clarifications to the May supplemental workplan were submitted to the County. Final site investigation field work took place in September and December 1994.

In October and November 1995 contaminated soil was excavated from the site around the former gasoline tank cluster and air sparging lines were installed in the open excavations prior to backfill. Some of the contaminated soil was aerated on site and reused as backfill material and some was transported to a local landfill for disposal.

During the remedial excavation program monitoring wells MW-1, MW-2, MW-3, MW-4 and MW-9 were removed. In December 1995 two new wells MW-3B and MW-4B were installed in two locations within the newly backfilled excavation area, near the former locations of MW-3 and MW-4, respectively. Subsequent to completion of a pilot test, operation of the groundwater sparging system began in late March 1996.

2.0 FLOATING PRODUCT

This quarter, each monitoring well was visually inspected for the presence of floating product. Prior to well purging, a column of groundwater was bailed from the water surface in a transparent bailer suitable for capture of light hydrocarbons.

No floating product or sheen was detected in any of the groundwater wells inspected this quarter. No floating product has been observed in any WPC Alameda wells on previous monitoring occasions.

3.0 GROUNDWATER SAMPLING

A quantity of groundwater is purged from each monitoring well prior to collecting a sample for chemical analysis. A description of equipment and procedures employed for groundwater purging and sample collection is presented in the following paragraphs.

3.1 Sampling Protocol

All the WPC Alameda monitoring wells are equipped with a 0.5 inch OD polyethylene tube extending the full depth of the well. Well purging is accomplished by attaching an Accuwell PTP-150 peristaltic pump at the well head to draw groundwater from the well. This procedure eliminates the need for any downhole equipment.

As groundwater is extracted from the well, 20ml samples are periodically collected for measurement of pH, temperature and conductivity using a Hydac instrument. Groundwater data is recorded on purge data forms (presented in the Appendix). At the conclusion of purging, the well is allowed to recharge to at least 80% of its initial water level prior to sample collection.

Purge water is contained in 55 gallon drums during the sampling process. At the conclusion of sampling, purge water drums are sealed, labeled and stored on-site in a secure area pending chemical analysis and arrangements for proper disposal.

Groundwater sample collection is performed by lowering a new, disposable, bailer into the well. Sample water is transferred to a laboratory supplied 40 ml VOA bottle containing a suitable preservative. The sample bottles are only opened during sample transfer, are completely filled and are not re-opened again by field personnel.

All samples are immediately labeled, sealed in zip lock bags and placed in a cooler containing crushed ice. The samples remain chilled, sealed and undisturbed during transport to the testing laboratory, usually within no more than 48 hours. All samples are entered on a chain of custody form which accompanies the sample set at all times.

Chemical analysis was performed by Anlab Analytical Laboratory located in Sacramento, California. Anlab is certified by the Department of Health Services for the analyses performed.

Quality assurance and quality control measures include:

- Utilizing State WQCB approved sampling methods
- Assigning trained, experienced personnel for sample collection
- Utilizing laboratory supplied sample containers
- Employing extraction methods not requiring downhole equipment
- Using new, disposable bailers
- Sampling wells sequentially from cleanest to most contaminated
- Maintaining sample chain of custody documentation
- Keeping samples in a chilled state until laboratory delivery
- Storing high concentration samples in a separate container
- Prompt delivery of the sample set to the testing laboratory
- Utilizing a DHS certified laboratory

3.2 Sample Analyses

The present analytical schedule for the site was proposed by West & Associates in the March 1996 Quarterly Groundwater Monitoring Report and approved by the ACEHS in correspondence dated May 14, 1996. The frequency of EPA Method 624 and 625 analysis for groundwater samples has been changed from quarterly to semi-annual. Analysis of groundwater samples by EPA Methods 624 and 625 was conducted this quarter.

Each groundwater sample except MW-7 was analyzed for Total Petroleum Hydrocarbons in the gasoline range (TPH-g) by EPA method 8015. Groundwater from monitoring well MW-7 was analyzed for TPH in the diesel range by EPA method 8015. All groundwater samples, except for MW-7, were also analyzed for volatile organics by EPA method 624. Monitoring well MW-3B was analyzed for naphthalene by EPA method 625.

All analyses were performed using EPA approved test methods. Minimum detection limits for all analyses were within Tri-regional guidelines and are indicated on each original laboratory report forms.

This quarters analytical results for TPH-g and BTXE contamination are presented in Table 1. Copies of original laboratory data sheets and chain of custody forms are presented in the appendix.

Results of laboratory analysis indicate that TPH as diesel was detected in groundwater sample MW-7 at a concentration of 3.8 mg/l.

TABLE 1
PETROLEUM CONTAMINATION ANALYSES - GROUNDWATER
February 13, 1997
All Values in ug/l

WELL ID	TPH (gas)	BENZENE	TOLUENE	XYLENES	ETHYL BENZENE
MW-3B	12,000	1,000	210	690	120
MW-4B	220	ND	ND	ND	ND
MW-5	26	0.58	ND	ND	ND
MW-6	25	0.54	ND	ND	ND
MW-10	ND	ND	ND	ND	ND
MW-11	ND	ND	ND	ND	ND
MW-12	ND	ND	ND	ND	ND

ABBREVIATIONS

ug/l: Micrograms per liter

ND: Not Detected (See Appendix for minimum detection limits)

TPH: Total Petroleum Hydrocarbons

3.3 Conclusions

An increase in TPH-gas and BTXE concentrations was observed in the groundwater sample collected from well MW-3B this quarter as compared to last quarter. Although contaminant concentrations in well MW-3B were higher this quarter compared to last quarter, contaminant levels were approximately half of what was detected during the first quarter of 1996. Table 2 presents the percent reduction in TPH-gas and benzene concentrations in well MW-3B compared to the previous four quarters. A rebound in contaminant reduction in well MW-3B is evident in Table 2. MW-3B has historically been the most contaminated well at the site.

TABLE 2
GROUNDWATER CONTAMINANT COMPARISON: WELL MW-3B
FIRST QUARTER 1996 THRU FIRST QUARTER 1997
All Values in ug/l

Date	TPH (gas)	BENZENE	PERCENT REDUCTION TPH-gas (since 2/96)	PERCENT REDUCTION BENZENE (since 2/96)
2/96	19,000	2,100	NA	NA
6/96	11,000	1,300	42%	38%
9/96	6,000	840	68%	60%
11/96	5,500	440	71%	79%
2/97	12,000	1,000	37%	52%

ABBREVIATIONS

ug/l: Micrograms per liter

TPH: Total Petroleum Hydrocarbons

TPH concentrations were slightly lower in monitoring well MW-5 and were slightly higher in wells MW-3B, MW-4B, MW-6 and MW-7 this quarter relative to last quarter. Benzene concentrations were slightly lower in monitoring well MW-4B and slightly higher in wells MW-3B, MW-5 and MW-6 this quarter, compared to last quarter. Neither TPH-gas nor BTXE were detected in monitoring wells MW-10 or MW-12 this quarter. Contaminant concentrations detected in all contaminated wells this quarter are within the range of previous fluctuation observed at the site, during recent monitoring events.

TPH-gas and BTXE concentrations remain very low in all existing monitoring wells except for MW-3B.

A summary of historic groundwater contaminant concentrations is presented in Table 3 through Table 5.

Results of volatile organic and semi-volatile organic (naphthalene) analyses this quarter were generally consistent with previous findings.

TABLE 3
SUMMARY OF PETROLEUM CONTAMINATION ANALYSES
All Values in ug/l

MONITORING WELL MW-2

DATE	TPH (gas)	BENZENE	TOLUENE	XYLENES	ETHYL BENZENE
12/23/91	2,300	720	66	240	1.5
4/27/92	1,100	9.4	5.3	24	2
7/31/92	1,500	3.3	5.3	26	10
1/8/93	70	ND	ND	1.4	0.5
4/6/93	ND	ND	ND	ND	ND
7/12/93	1,600	1.4	2.3	8.2	2.5
2/94	200	390	25	50	7.1
6/94	1,300	370	44	170	100
12/94	3,400	1,100	86	190	28
3/7/95	6,500	2,300	240	310	120
9/26/95	440	140	26	46	52

TABLE 3 CONTINUED - MONITORING WELL MW-3

DATE	TPH (gas)	BENZENE	TOLUENE	XYLENES	ETHYL BENZENE
12/23/91	14,000	3,000	540	1,200	370
4/27/92	9,400	57	50	220	4.6
7/31/92	1,400	1.9	5.1	23	8.3
1/8/93	15,000	38	40	140	64
4/6/93	21,000	62	76	200	84
7/12/93	22,000	22	41	120	42
2/94	5,400	3,900	680	840	390
6/94	23,000	8,500	1,700	3,800	1,600
12/94	41,000	9,900	2,900	3,500	1,400
3/7/95	42,000	9,900	3,000	4,100	1,600
9/26/95	24,000	5,300	1,200	2,200	940

TABLE 3 CONTINUED - MONITORING WELL MW-3B

DATE	TPH (gas)	BENZENE	TOLUENE	XYLENES	ETHYL BENZENE
2/7/96	19,000	2,100	380	1,200	480
6/5/96	11,000	1,300	250	860	370
9/4/96	6,000	840	98	410	140
11/21/96	5,500	440	31	140	50
2/13/97	12,000	1,000	210	690	120

TABLE 3 CONTINUED - MONITORING WELL MW-4

DATE	TPH (gas)	BENZENE	TOLUENE	XYLENES	ETHYL BENZENE
4/27/92	790	7.7	2.6	11	2
7/31/92	1,300	6.1	4.3	21	7.3
1/8/93	860	1.5	4.5	17	9.6
4/6/93	2,500	5.2	6.3	17	11
7/12/93	2,000	1.8	3.8	11	3.9
2/94	1,000	54	2.7	4.7	1.4
6/94	460	46	0.8	8.4	1.1
12/94	2,400	200	7.5	28	7.5
3/7/95	3,800	360	14	49	33
9/26/95	2,900	90	ND	5.7	8.9

TABLE 3 CONTINUED - MONITORING WELL MW-4B

DATE	TPH (gas)	BENZENE	TOLUENE	XYLENES	ETHYL BENZENE
2/7/96	520	3	2.4	1.0	1.6
6/5/96	350	ND	ND	ND	1.6
9/4/96	71	3.3	ND	0.70	1.8
11/21/96	170	1.5	ND	ND	1.0
2/13/97	220	ND	ND	ND	ND

TABLE 3 CONTINUED - MONITORING WELL MW-5

DATE	TPH (gas)	BENZENE	TOLUENE	XYLENES	ETHYL BENZENE
4/27/92	ND	ND	ND	ND	ND
7/31/92	ND	ND	ND	ND	ND
1/8/93	ND	ND	ND	ND	ND
4/6/93	ND	ND	ND	ND	ND
7/12/93	0.27	ND	ND	1.4	0.6
2/94	ND	1.8	ND	ND	ND
6/94	ND	1.0	ND	ND	ND
12/94	93	3.0	0.9	3.0	0.8
3/7/95	79	2.9	ND	ND	ND
9/26/95	67	ND	ND	ND	ND
2/7/96	120	7	ND	ND	ND
6/5/96	100	ND	ND	ND	ND
9/4/96	ND	2.4	ND	ND	ND
11/21/96	62	ND	ND	ND	ND
2/13/97	26	0.58	ND	ND	ND

TABLE 3 CONTINUED - MONITORING WELL MW-6

DATE	TPH (gas)	BENZENE	TOLUENE	XYLENES	ETHYL BENZENE
4/27/92	ND	ND	ND	ND	ND
7/31/92	ND	ND	ND	ND	ND
1/8/93	ND	ND	ND	ND	ND
4/6/93	ND	ND	ND	ND	ND
7/12/93	NA	NA	NA	NA	NA
2/94	ND	2.6	ND	ND	ND
6/94	ND	2.2	ND	ND	ND
12/94	ND	1.3	ND	ND	ND
3/7/95	72	2.5	ND	ND	ND
9/26/95	ND	ND	ND	ND	ND
2/7/96	60	0.84	ND	ND	ND
6/5/96	45	1.2	ND	ND	ND
9/4/96	40	0.80	ND	ND	ND
11/21/96	ND	ND	ND	ND	ND
2/13/97	25	0.54	ND	ND	ND

TABLE 3 CONTINUED - MONITORING WELL MW-7

DATE	TPH diesel	TPH gas	BENZENE	TOLUENE	XYLENES	ETHYL BENZENE
1/8/93	ND	NA	ND	ND	ND	ND
4/6/93	190	NA	ND	ND	ND	ND
7/12/93	80	NA	ND	ND	ND	ND
2/94	ND	ND	ND	ND	ND	ND
6/94	ND	ND	ND	ND	ND	ND
12/94	3.9	ND	ND	ND	ND	ND
3/7/95	1,400	NA	NA	NA	NA	NA
9/26/95	1,100	NA	NA	NA	NA	NA
2/7/96	1,200	NA	NA	NA	NA	NA
6/5/96	1,100	NA	NA	NA	NA	NA
9/4/96	ND	NA	NA	NA	NA	NA
11/21/96	2.2	NA	NA	NA	NA	NA
2/13/97	3.8	NA	NA	NA	NA	NA

TABLE 3 CONTINUED - MONITORING WELL MW-9

DATE	TPH (gas)	BENZENE	TOLUENE	XYLENES	ETHYL BENZENE
2/94	1,900	63	4.3	14	22
6/94	5,300	150	20	110	380
12/94	12,000	600	20	55	120
3/7/95	9,900	820	22	78	230
9/26/95	5,900	340	ND	20	53

ABBREVIATIONS

ug/l: Micrograms per liter

ND: Not Detected (See Appendix for minimum detection limits)

NA: Not Analyzed

TPH: Total Petroleum Hydrocarbons

*Wells MW-10, 11, + 12 ND
for TPH + BTEX.*

TABLE 4
SUMMARY OF VOLATILE ORGANIC ANALYSES RESULTS
All Values in ug/l

MONITORING WELL MW-3

DATE	VINYL CHLORIDE	1,1-DICHLORO-ETHANE	1,2-DICHLORO-ETHANE	CARBON DISULFIDE
2/94	ND	130	95	120
3/7/95	81	110	150	ND
9/26/95	ND	100	ND	ND

TABLE 4 CONTINUED - MONITORING WELL MW-3B

DATE	VINYL CHLORIDE	1,1-DICHLORO-ETHANE	1,2-DICHLORO-ETHANE	1,1,2-TRICHLORO-ETHANE
2/7/96	ND	ND	ND	ND
9/4/96	ND	30	5.0	ND
2/13/97	ND	21	33	60

TABLE 4 CONTINUED - MONITORING WELL MW-4

DATE	1,1-DICHLORO-ETHANE	1,2-DICHLORO-ETHANE	TRICHLOROETHENE	CARBON DISULFIDE	CHLOROETHANE
2/94	22	18	2.1	4.7	1.9
3/7/95	11	15	ND	ND	ND
9/26/95	10	6.6	ND	ND	ND

TABLE 4 CONTINUED - MONITORING WELL MW-4B

DATE	1,1-DICHLORO-ETHANE	1,2-DICHLORO-ETHANE	TETRACHLORO-ETHENE	TRICHLORO-ETHENE
2/7/96	7.4	6.2	ND	ND
9/4/96	15	13	ND	1.2
2/13/97	12	10	1.8	1.48

TABLE 4 CONTINUED - MONITORING WELL MW-5

DATE	1,1-DICHLORO-EHTANE	1,2-DICHLORO-ETHANE	1,1-DICHLORO-ETHENE	TETRA-CHLORO-ETHENE	TRICHLORO-ETHENE
2/94	11	ND	ND	1.1	ND
3/7/95	24	ND	ND	ND	ND
9/26/95	31	ND	ND	ND	ND
2/7/96	31	ND	ND	ND	ND
9/4/96	28	2.5	1.1	3.5	1.4
2/13/97	17	1.4	ND	1.1	ND

TABLE 4 CONTINUED - MONITORING WELL MW-6

DATE	1,1-DICHLORO-EHTANE	1,2-DICHLORO-ETHANE	TETRA-CHLORO-ETHENE	TRICHLORO-ETHENE	1,2-DICHLORO-ETHENE
2/94	2.6	1.1	1.3	ND	2.1
3/7/95	9.4	ND	ND	ND	ND
9/26/95	12	ND	ND	ND	ND
2/7/96	7.6	ND	ND	ND	ND
9/4/96	16	5.4	1.5	2.0	ND
2/13/97	16	4.1	1.6	1.7	ND

TABLE 4 CONTINUED - MONITORING WELL MW-9

DATE	1,1-DICHLORO-EHTANE	1,2-DICHLORO-EHTANE
3/7/95	12	14
9/26/95	8.7	ND

TABLE 4 CONTINUED - MONITORING WELL MW-12

DATE	1,1-DICHLOROETHANE	1,2-DICHLOROETHANE	TETRACHLOROETHENE
3/7/95	11	ND	ND
9/26/95	9.6	ND	ND
9/4/96	2.4	ND	ND
2/13/97	ND	3.2	4.3

ABBREVIATIONS

ug/l: Micrograms per liter

ND: Not Detected (See Appendix for minimum detection limits)

TABLE 5
SUMMARY OF SEMI-VOLATILE ORGANIC ANALYSES RESULTS
All Values in ug/l

MONITORING WELL MW-2

DATE	NAPHTHALENE
2/94	19
3/7/95	2.4
9/26/95	ND

TABLE 5 CONTINUED - MONITORING WELL MW-3

DATE	NAPHTHALENE	METHYLNAPHTHALENE
2/94	19	45
3/7/95	120	ND
9/26/95	310	ND

TABLE 5 CONTINUED - MONITORING WELL MW-3B

DATE	NAPHTHALENE
2/7/96	130
9/4/96	100
2/13/97	260

ABBREVIATIONS

ug/l: Micrograms per liter

ND: Not Detected (See Appendix for minimum detection limits)

4.0 HYDROLOGIC MONITORING

Depth to groundwater (DTGW) was measured in all eight of the WPC Alameda monitoring wells on February 13, 1997 this quarter. DTGW was measured using a Solinst electronic sounding meter. Measurement accuracy was +/- 0.01 feet.

Table 6 presents depth to groundwater measurements (DTGW) and groundwater elevations (GWE) as measured on February 13, 1997. The change in groundwater elevation in each well relative to the most recent previous measurement (November 21, 1996) is also indicated in Table 6.

Figure 3 illustrates groundwater contours under the site extrapolated from the February 13, 1997 groundwater elevation data. The groundwater gradient direction measured this quarter was toward the northwest. This groundwater gradient direction is consistent with previous groundwater gradient observations at the WPC site.

TABLE 6 - HYDROLOGIC MEASUREMENTS
February 13, 1997
(All measurements in feet)

WELL ID	TOC	DTGW	GWE	CHANGE ¹
MW-3B	9.81	5.56	4.25	+0.30
MW-4B	9.59	5.63	3.96	+0.59
MW-5	9.77	5.14	4.63	+1.08
MW-6	10.04	6.05	3.99	+0.98
MW-7	7.68	2.60	5.08	-0.01
MW-10	9.37	5.20	4.17	+0.50
MW-11	8.78	4.45	4.33	+0.54
MW-12	12.32	7.63	4.69	+0.47

ABBREVIATIONS

TOC: Top of Casing

DTGW: Depth to Groundwater

GWE: Groundwater Elevation

¹ Relative to last available DTGW measurement: November 21, 1996

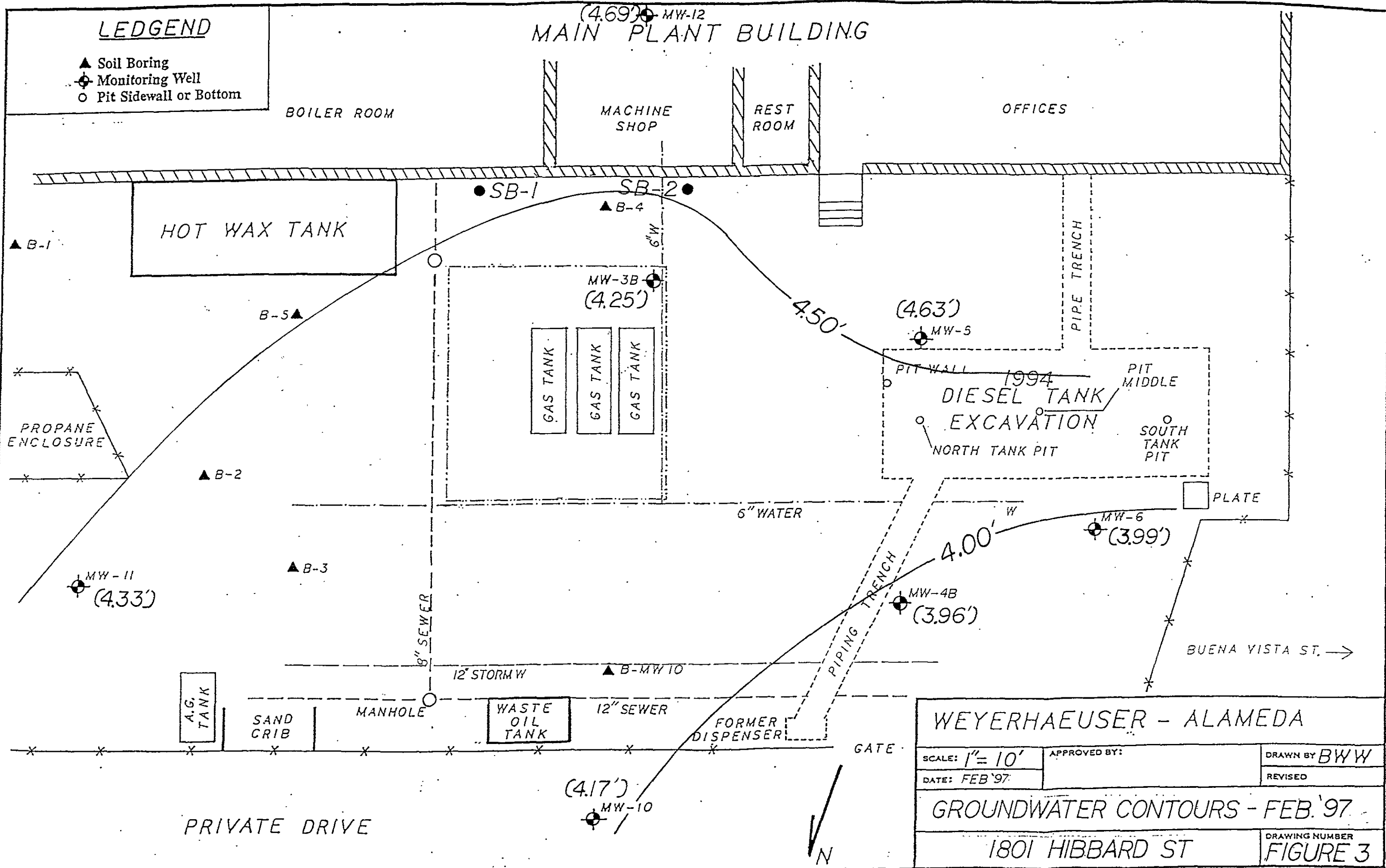
4.1 Conclusions

Groundwater elevations were higher in all monitoring wells this quarter as compared to last quarter, except for monitoring well MW-7. The increase in groundwater elevations relative to last quarter is consistent with the seasonal fluctuation observed previously at the site. The groundwater gradient direction was measured to be toward the northwest this quarter, which is within the range of previous recordings.

LEDGEND

- ▲ Soil Boring
- ⊕ Monitoring Well
- Pit Sidewall or Bottom

MAIN PLANT BUILDING



WEYERHAEUSER - ALAMEDA

SCALE: 1" = 10'
 DATE: FEB '97
 APPROVED BY:
 DRAWN BY: BWW
 REVISED:

GROUNDWATER CONTOURS - FEB. '97

1801 HIBBARD ST
 DRAWING NUMBER
FIGURE 3

5.0 SUMMARY

- All eight WPC groundwater wells were monitored on February 13, 1997.
- No floating product was observed in any groundwater well this quarter.
- Contaminant concentrations in groundwater have decreased in the areas around the former gasoline tank cluster since September 1995.
- Contaminant concentrations in groundwater have generally decreased under the entire site compared to this time last year.
- Groundwater levels have generally increased under the entire site as compared to the last quarter of monitoring (November 21, 1996).

5.1 Remedial Status

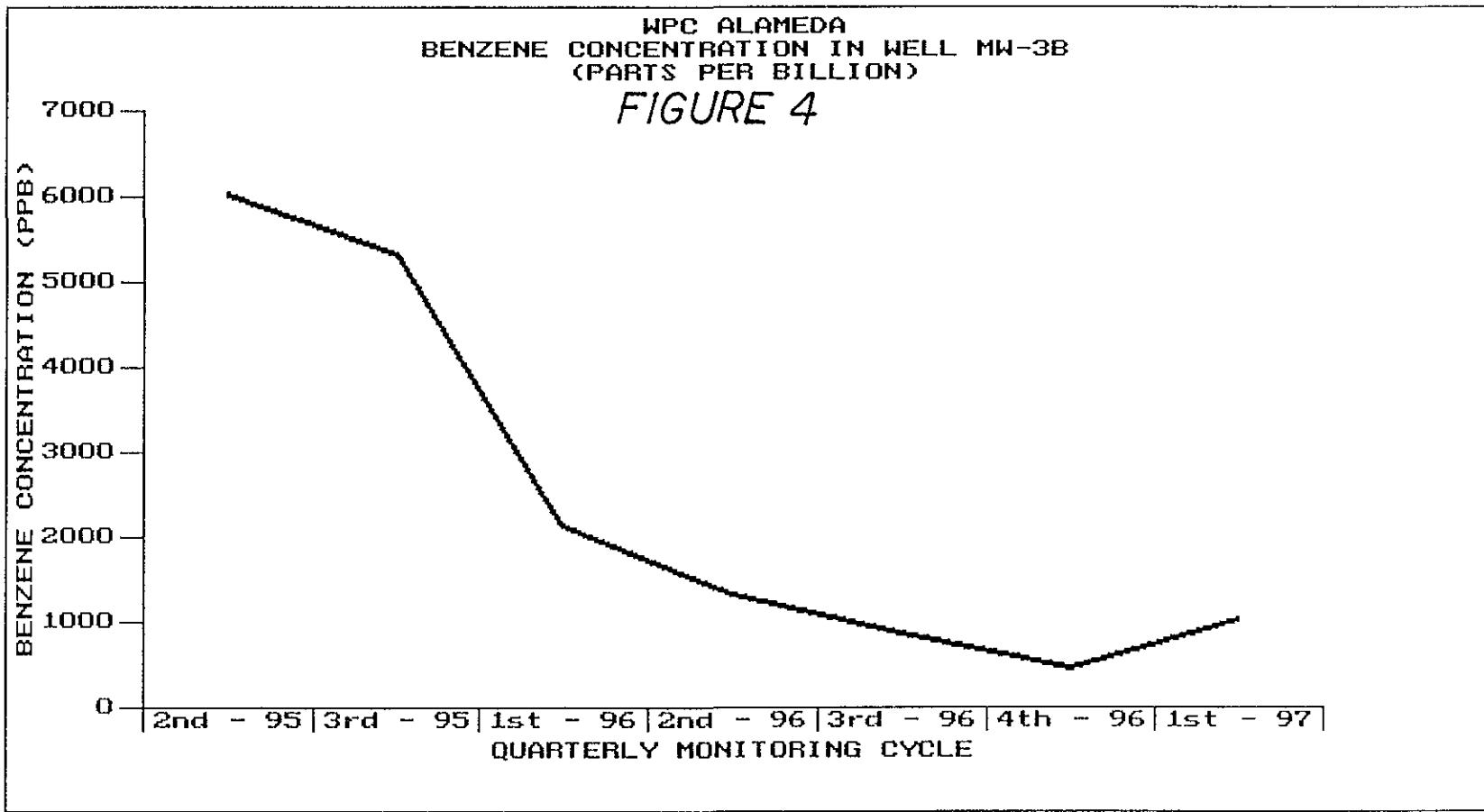
In November 1995 contaminated soil was excavated in the vicinity of the former underground fuel tank cluster. The area was backfilled with clean soil.

Construction of a groundwater sparging/soil vapor extraction system was completed in February 1996.

Pilot testing was completed on the newly installed groundwater sparging/soil vapor extraction system on March 19, 1996. Findings of the pilot test are presented in the March 1996 Air Sparging and Vapor Extraction System Test Report prepared by West & Associates Environmental Engineers.

Full scale operation of the sparging system began at the end of March 1996 under permit from the Bay Area Air Quality Management District. Activated carbon adsorption is used to prevent volatile emissions to the atmosphere. While in operation, the remedial system is monitored at least weekly.

A decrease in soil vapor volatile concentration has been observed since start up of the sparging system. There has also been a decrease in groundwater contaminant concentrations observed since start up of remedial activities. A slight rebound in the decreasing trend of contaminant reduction in MW-3B was observed this quarter. The benzene concentration measured in groundwater samples collected from well MW-3B since the start of remedial activities is presented graphically in Figure 4. This rebound may be attributed to the seasonable high groundwater levels measured below the site this quarter. TPH-gas and BTXE concentrations in MW-3B, however, are approximately 37% and 52% lower, respectively, than this time last year, prior to the start up of groundwater sparging.



WEST & ASSOCIATES ENGINEERS

GROUNDWATER SAMPLING - PURGE DATA FORM

Project: WEYERHAEUSER ALAMEDA

Location: WITHIN SOUTH SIDE OF REMEDIAL EXCAV. AREA

Monitoring Well ID: MW-3B Sampler: BWW BGM

Date: FEB. 13, 1997 Time: 3:53 AM PM

Floating Product: Y N Petroleum Sheen: Y N

ODOR / APPEARANCE: GASOLINE ODOR PRESENT / CLEAR

16' 5.56' 2" 4" 1.8
WELL DEPTH - DTGW x .17 .66 = WELL VOLUME (GALS)

PURGE MEASUREMENTS

TIME	PURGE VOLUME GALLONS	CUMULATIVE GALLONS	TEMP. °F	CONDUCT umhos x 100	PH
3:53	0	0	62.5	11.54	7.04
3:55	2	2	62.2	10.68	7.12
3:57	2	4	62.5	12.11	7.13
3:59	2	6	62.7	12.03	7.15

REMARKS: _____

WEST & ASSOCIATES ENGINEERS

GROUNDWATER SAMPLING - PURGE DATA FORM

Project: WEYERHAEUSER ALAMEDA

Location: NORTH WEST OF FORMER REMEDIAL EXCAV.

Monitoring Well ID: MW-4B Sampler: BWW BGM

Date: FEB. 13, 1997 Time: 3:43 AM PM

Floating Product: Y N Petroleum Sheen: Y N

ODOR / APPEARANCE: SL. GASOLINE ODOR / CLEAR

16' 5.63' 2" 4" 1.8
 WELL DEPTH - DTGW x .17 .66 = WELL VOLUME (GALS)

PURGE MEASUREMENTS

TIME	PURGE VOLUME GALLONS	CUMULATIVE GALLONS	TEMP. °F	CONDUCT umhos x 100	PH
3:43	0	0	62.4	11.92	7.16
3:45	2	2	62.0	10.92	7.22
3:47	2	4	62.2	11.81	7.21
3:49	2	6	62.6	11.46	7.18

REMARKS: _____

WEST & ASSOCIATES ENGINEERS

GROUNDWATER SAMPLING - PURGE DATA FORM

Project: WEYERHAEUSER ALAMEDA

Location: WEST OF FORMER REMEDIAL EXCAVATION

Monitoring Well ID: MW-5 Sampler: BWW BOM

Date: FEB. 13, 1997 Time: 3:32 AM PM

=====

Floating Product: Y N Petroleum Sheen: Y N

ODOR / APPEARANCE: NO APPARENT GAS ODOR / CLEAR

17.5' 5.14' 2" 4" 2:1
 WELL DEPTH - DTGW x .17 .66 = WELL VOLUME (GALS)

=====

PURGE MEASUREMENTS

TIME	PURGE VOLUME GALLONS	CUMULATIVE GALLONS	TEMP. °F	CONDUCT umhos x 100	PH
3:32	0	0	63.7	8.59	7.42
3:34	2	2	62.3	8.34	7.50
3:36	2	4	62.0	—	7.62
3:39	2	6	62.2	8.27	7.52

REMARKS: _____

WEST & ASSOCIATES ENGINEERS

GROUNDWATER SAMPLING - PURGE DATA FORM

Project: WEYERHAEUSER ALAMEDA

Location: WEST END OF SITE

Monitoring Well ID: MW-6 Sampler: BWW BGM

Date: FEB. 13, 1997 Time: 3:18 AM PM

Floating Product: Y N Petroleum Sheen: Y N

ODOR / APPEARANCE: NO GASOLINE ODOR / CLEAR

19.65' 6.05' 2" 4" 2.3
 WELL DEPTH - DTGW x .17 .66 = WELL VOLUME (GALS)

PURGE MEASUREMENTS

TIME	PURGE VOLUME GALLONS	CUMULATIVE GALLONS	TEMP. °F	CONDUCT umhos x 100	PH
3:18	0	0	65.9	7.60	7.74
3:20	2.3	2.3	64.2	5.58	7.73
3:23	2.3	4.6	64.6	7.88	7.50
3:26	2.3	6.9	64.7	8.37	7.49

REMARKS: _____

WEST & ASSOCIATES ENGINEERS

GROUNDWATER SAMPLING - PURGE DATA FORM

Project: WEYERHAEUSER ALAMEDA

Location: EAST END OF SITE

Monitoring Well ID: MW-7 Sampler: ~~BWW~~ BGM

Date: FEB. 13, 1997 Time: 6:05 AM PM

Floating Product: Y N Petroleum Sheen: Y N

ODOR / APPEARANCE: NO HYDROCARBON ODOR / BROWNISH → CLEAR

17.86' 2.60' 2" 4" 2.6
 WELL DEPTH - DTGW x .17 .66 = WELL VOLUME (GALS)

PURGE MEASUREMENTS

TIME	PURGE VOLUME GALLONS	CUMULATIVE GALLONS	TEMP. °F	CONDUCT umhos x 100	PH
6:05	0	0	60.2	16.72	8.65
6:07	2.6	2.6	60.2	16.67	7.83
6:10	2.6	5.2	59.5	15.70	6.83
6:13	2.6	7.8	59.6	16.16	6.36

REMARKS: BROWN PARTICULATES - BACTERIA?

WEST & ASSOCIATES ENGINEERS

GROUNDWATER SAMPLING - PURGE DATA FORM

Project: WEYERHAEUSER ALAMEDA

Location: IN STREET, NORTH OF SITE

Monitoring Well ID: MW-10 Sampler: BWW BGM

Date: FEB. 13, 1997 Time: 1:35 AM PM

=====

Floating Product: Y N Petroleum Sheen: Y N

ODOR / APPEARANCE: NO GASOLINE ODOR / CLEAR

17.05' 5.20' 2" 4" 7.8
WELL DEPTH - DTGW x .17 .66 = WELL VOLUME (GALS)

=====

PURGE MEASUREMENTS

TIME	PURGE VOLUME GALLONS	CUMULATIVE GALLONS	TEMP. °F	CONDUCT umhos x 100	PH
1:35	0	0	67.9	6.55	8.95
1:42	8	8	65.8	6.40	8.59
1:51	8	16	66.4	6.52	8.34
2:00	8	24	66.1	6.21	8.36

REMARKS: _____

WEST & ASSOCIATES ENGINEERS

GROUNDWATER SAMPLING - PURGE DATA FORM

Project: WEYERHAEUSER ALAMEDA

Location: EAST OF FORMER GAS UST CLUSTER

Monitoring Well ID: MW-11 Sampler: BWW BGM

Date: FEB. 13, 1997 Time: 2:06 AM PM

=====
 Floating Product: Y N Petroleum Sheen: Y N

ODOR / APPEARANCE: NO GASOLINE ODOR CLEAR

18.40 4.45' 2" 4" 9.2
 WELL DEPTH - DTGW x .17 .66 = WELL VOLUME (GALS)

PURGE MEASUREMENTS

TIME	PURGE VOLUME GALLONS	CUMULATIVE GALLONS	TEMP. °F	CONDUCT umhos x 100	PH
2:06	0	0	66.6	8.87	8.37
2:16	9	9	64.2	8.46	8.10
2:27	9	18	65.5	8.40	7.86
2:38	9	27	66.1	8.45	7.79

REMARKS: _____

WEST & ASSOCIATES ENGINEERS

GROUNDWATER SAMPLING - PURGE DATA FORM

Project: WEYERHAEUSER ALAMEDA

Location: INSIDE BUILDING (SHOP AREA)

Monitoring Well ID: MW-12 Sampler: BWW BGM

Date: FEB. 13, 1997 Time: 2:54 AM PM

=====

Floating Product: Y N Petroleum Sheen: Y N

ODOR / APPEARANCE: NO GAS ODOR / CLEAR

15.90' 7.63' 2" 4" 5.5
 WELL DEPTH - DTGW x .17 .66 = WELL VOLUME (GALS)

=====

PURGE MEASUREMENTS

TIME	PURGE VOLUME GALLONS	CUMULATIVE GALLONS	TEMP. °F	CONDUCT umhos x 100	PH
2:54	0	0	68.6	12.53	7.63
2:59	5.5	5.5	68.2	12.65	7.41
3:05	5.5	11.0	67.6	12.56	7.18
3:11	5.5	16.5	67.5	12.72	7.09

REMARKS: _____



ANALYTICAL LABORATORY

1810 "S" STREET • SACRAMENTO • CA • 95814

(916) 447-2046 • FAX (916) 447-8321

CLIENTS RELEASE OF SAMPLE TO ANLAB CONSTITUTES AN AGREEMENT TO PAY ANLAB WITHIN 30 DAYS OF BEING INVOICED FOR WORK PERFORMED. SHOULD ANLAB HAVE TO TAKE LEGAL ACTION FOR COLLECTION, CLIENT AGREES TO PAY ANLAB'S ATTORNEY FEES AND COST OF COLLECTION.

CLIENT INFORMATION

Company: WEST & ASSOCIATES Contact Name: BRENNAN MAHONEY
 Address: PO BOX 5891
 City: VACAVILLE State: CA Zip: 95696
 Billing Address: SAME
 Telephone: (707) 451-1300 FAX: (707) 447-0998
 Project Name: WPC ALAMEDA P.O Number:
 Sampler's Co.: WEST & ASSOC. Sampler's Name: B. MAHONEY

Anlab Use Only:
 Hours: _____
 Miles: _____
 Equip.: _____

ANALYSIS ▶	SAMPLE IDENTIFICATION	Date	Time	SW	GMS	FM 624	TMH-DI-100	EPA 825	ANALYTICAL	Sample Type				Number of Containers				Preservation		
										W	W	SOIL	SLUDGE	PLASTIC	GLASS	VOA	STERIL	TEMP	ACID	BASE
	MW-3B	2/13/97	PM	✓	✓			✓						1	4			✓	✓	
	MW-4B	2/13/97		✓	✓										4			✓	✓	
	MW-5	2/13/97		✓	✓										4			✓	✓	
	MW-6	2/13/97		✓	✓										4			✓	✓	
	MW-7	2/13/97					✓						1					✓		
	MW-10	2/13/97		✓	✓										4			✓	✓	
	MW-11	2/13/97		✓	✓										4			✓	✓	
	MW-12	2/13/97		✓	✓										4			✓	✓	

COMMENTS/SPECIAL INSTRUCTIONS:

TURNAROUND TIME:
 24 HOUR 48 HOUR 72 HOUR
 6 DAY STANDARD
 QC LEVEL: A B C D

SAMPLE DISPOSAL: HOLD RETURN DISPOSE

SHIPPED VIA:
 UPS FED-EX BUS OVERNIGHT

SAMPLE RELINQUISHED BY	PRINT NAME/COMPANY	DATE/TIME	RECEIVED BY	PRINT NAME/COMPANY
<i>[Signature]</i>	BRENNAN MAHONEY WEST & ASSOC.	2/13/97	<i>[Signature]</i>	MW-3B

ANLAB WILL PERFORM THE SERVICES IN ACCORDANCE WITH THE NORMAL STANDARD OF WORKMANSHIP IN THE PROFESSION. THE TOTAL LIABILITY OF ANLAB, ITS OFFICERS, AGENTS, EMPLOYEES OR SUCCESSORS, TO THE CLIENT, SHALL NOT EXCEED THE INVOICED AMOUNT FOR EACH SERVICE. CLIENT'S ACCEPTANCE OF A WORK ORDER AND/OR PROPOSAL RELEASES ANLAB FROM ANY LIABILITY IN EXCESS OF THE INVOICED AMOUNT FOR THE SERVICES, NOTWITHSTANDING ANY PROVISION TO THE CONTRARY IN ANY CLIENT PURCHASE ORDER OR CONTRACT. ALL LITIGATION NOT DUE TO ANLAB'S NEGLIGENCE, WILL BE PAID BY THE CLIENT.

All hazardous waste samples will be returned to client or billed for disposal.



March 18, 1997

West & Associates Environmental Engineers
 P.O. Box 5891
 Vacaville, CA 95696
 Attn: Brian West

Project: WPC Alameda

Anlab I.D. AG02982
 SAMPLE DESCRIPTION: MW-3B
 Sample collection date: 02/13/97
 Lab submittal date: 02/14/97
 Turn-Around-Time: REG

Client Code: 891
 Matrix: W
 Time:
 Time: 10:41
 Sample Disposal: LAB

TEST PARAMETER	UNITS	TEST RESULT	DETECTION LIMIT

Multicomponent analysis: Gas(8015)/BTX&E(8020) EPA 5030			
Gasoline	ug/l	12000	20
Benzene	ug/l	1000	0.50
Toluene	ug/l	210	0.50
Xylene	ug/l	690	0.50
Ethylbenzene	ug/l	120	0.50

Multicomponent analysis: EPA 624 VOLATILE ORGANICS (*)			
Surrogate 1 (1,2-DCA-d4)	ug/l	100	76-118
Surrogate 2 (Toluene-d8)	ug/l	104	92-109
Surrogate 3 (4-BFB)	ug/l	110	83-112
Benzene	ug/l	1100	20
Bromodichloromethane	ug/l	ND	20
Bromoform	ug/l	ND	20
Bromomethane	ug/l	ND	20
Carbon tetrachloride	ug/l	ND	20
Chlorobenzene	ug/l	ND	20
Chloroethane	ug/l	ND	20
2-Chloroethylvinyl ether	ug/l	ND	40
Chloroform	ug/l	ND	20
Chloromethane	ug/l	ND	20
Dibromochloromethane	ug/l	ND	20
1,2-Dichlorobenzene (o-DCB)	ug/l	ND	20
1,3-Dichlorobenzene (m-DCB)	ug/l	ND	20
1,4-Dichlorobenzene (p-DCB)	ug/l	ND	20
1,1-Dichloroethane (1,1-DCA)	ug/l	21	20
1,2-Dichloroethane (1,2-DCA)	ug/l	33	20
1,1-Dichloroethene (1,1-DCE)	ug/l	ND	20
trans-1,2-Dichloroethene	ug/l	ND	20
1,2-Dichloropropane	ug/l	ND	20
cis-1,3-Dichloropropene	ug/l	ND	20



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March 18, 1997

West & Associates Environmental Anlab I.D. AG02982 (continued)

TEST PARAMETER	UNITS	TEST RESULT	DETECTION LIMIT
Multicomponent analysis: EPA 624 VOLATILE ORGANICS (continued)			(*)
trans-1,3-Dichloropropene	ug/l	ND	20
Ethyl benzene	ug/l	170	20
Dichloromethane (MeCl ₂)	ug/l	ND	40
1,1,2,2-Tetrachloroethane	ug/l	ND	20
Tetrachloroethene (PCE)	ug/l	ND	20
Toluene	ug/l	290	20
1,1,1-Trichloroethane (1,1,1-TCA)	ug/l	ND	20
1,1,2-Trichloroethane (1,1,2-TCA)	ug/l	60	20
Trichloroethene (TCE)	ug/l	ND	20
Trichlorofluoromethane (Freon 11)	ug/l	ND	20
Vinyl chloride (VC)	ug/l	ND	40
Xylenes	ug/l	1100	20
Multicomponent analysis: EPA 625 SEMI-VOL ORGANICS			(*)
Surrogate 1 (2-Flphenol)	ug/l	10	21-121
Surrogate 2 (Phenol-D5)	ug/l	7.1	35-114
Surrogate 3 (Nitrobenz-D5)	ug/l	81	35-114
Surrogate 4 (2-Flbiphenyl)	ug/l	77	43-116
Surrogate 5 (246-TriBRphen)	ug/l	38	10-123
Surrogate 6 (Terphenyl-d14)	ug/l	83	33-141
Naphthalene	ug/l	260	32

Anlab I.D. AG02983

SAMPLE DESCRIPTION: MW-4B

Sample collection date: 02/13/97

Lab submittal date: 02/14/97

Turn-Around-Time: REG

Client Code: 891

Matrix: W

Time:

Time: 10:41

Sample Disposal: LAB

TEST PARAMETER	UNITS	TEST RESULT	DETECTION LIMIT
Multicomponent analysis: Gas(8015)/BTX&E(8020) EPA 5030			
Gasoline	ug/l	220	20
Benzene	ug/l	ND	0.50
Toluene	ug/l	ND	0.50
Xylene	ug/l	ND	0.50
Ethylbenzene	ug/l	ND	0.50



Page: 3 of 12

March 18, 1997

West & Associates Environmental Anlab ID # AG02983 (continued)

TEST PARAMETER	UNITS	TEST RESULT	DETECTION LIMIT

Multicomponent analysis: EPA 624 VOLATILE ORGANICS			
Surrogate 1 (1,2-DCA-d4)	ug/l	98	76-118
Surrogate 2 (Toluene-d8)	ug/l	105	92-109
Surrogate 3 (4-BFB)	ug/l	109	83-112
Benzene	ug/l	ND	1.0
Bromodichloromethane	ug/l	ND	1.0
Bromoform	ug/l	ND	1.0
Bromomethane	ug/l	ND	1.0
Carbon tetrachloride	ug/l	ND	1.0
Chlorobenzene	ug/l	ND	1.0
Chloroethane	ug/l	ND	1.0
2-Chloroethylvinyl ether	ug/l	ND	2.0
Chloroform	ug/l	ND	1.0
Chloromethane	ug/l	ND	1.0
Dibromochloromethane	ug/l	ND	1.0
1,2-Dichlorobenzene (o-DCB)	ug/l	ND	1.0
1,3-Dichlorobenzene (m-DCB)	ug/l	ND	1.0
1,4-Dichlorobenzene (p-DCB)	ug/l	ND	1.0
1,1-Dichloroethane (1,1-DCA)	ug/l	12	1.0
1,2-Dichloroethane (1,2-DCA)	ug/l	10	1.0
1,1-Dichloroethene (1,1-DCE)	ug/l	ND	1.0
trans-1,2-Dichloroethene	ug/l	ND	1.0
1,2-Dichloropropane	ug/l	ND	1.0
cis-1,3-Dichloropropene	ug/l	ND	1.0
trans-1,3-Dichloropropene	ug/l	ND	1.0
Ethyl benzene	ug/l	ND	1.0
Dichloromethane (MeCl2)	ug/l	ND	2.0
1,1,2,2-Tetrachloroethane	ug/l	ND	1.0
Tetrachloroethene (PCE)	ug/l	1.8	1.0
Toluene	ug/l	ND	1.0
1,1,1-Trichloroethane (1,1,1-TCA)	ug/l	ND	1.0
1,1,2-Trichloroethane (1,1,2-TCA)	ug/l	ND	1.0
Trichloroethene (TCE)	ug/l	1.4	1.0
Trichlorofluoromethane (Freon 11)	ug/l	ND	1.0
Vinyl chloride (VC)	ug/l	ND	2.0
Xylenes	ug/l	ND	1.0



Page: 4 of 12
 March 18, 1997
 West & Associates Environmental

Anlab I.D. AG02984
 SAMPLE DESCRIPTION: MW-5
 Sample collection date: 02/13/97
 Lab submittal date: 02/14/97
 Turn-Around-Time: REG

Client Code: 891
 Matrix: W
 Time:
 Time: 10:41
 Sample Disposal: LAB

TEST PARAMETER	UNITS	TEST RESULT	DETECTION LIMIT

Multicomponent analysis: Gas(8015)/BTX&E(8020) EPA 5030			
Gasoline	ug/l	26	20
Benzene	ug/l	0.58	0.50
Toluene	ug/l	ND	0.50
Xylene	ug/l	ND	0.50
Ethylbenzene	ug/l	ND	0.50

Multicomponent analysis: EPA 624 VOLATILE ORGANICS			
Surrogate 1 (1,2-DCA-d4)	ug/l	98	76-118
Surrogate 2 (Toluene-d8)	ug/l	105	92-109
Surrogate 3 (4-BFB)	ug/l	109	83-112
Benzene	ug/l	1.0	1.0
Bromodichloromethane	ug/l	ND	1.0
Bromoform	ug/l	ND	1.0
Bromomethane	ug/l	ND	1.0
Carbon tetrachloride	ug/l	ND	1.0
Chlorobenzene	ug/l	ND	1.0
Chloroethane	ug/l	ND	1.0
2-Chloroethylvinyl ether	ug/l	ND	2.0
Chloroform	ug/l	ND	1.0
Chloromethane	ug/l	ND	1.0
Dibromochloromethane	ug/l	ND	1.0
1,2-Dichlorobenzene (o-DCB)	ug/l	ND	1.0
1,3-Dichlorobenzene (m-DCB)	ug/l	ND	1.0
1,4-Dichlorobenzene (p-DCB)	ug/l	ND	1.0
1,1-Dichloroethane (1,1-DCA)	ug/l	17	1.0
1,2-Dichloroethane (1,2-DCA)	ug/l	1.4	1.0
1,1-Dichloroethene (1,1-DCE)	ug/l	ND	1.0
trans-1,2-Dichloroethene	ug/l	ND	1.0
1,2-Dichloropropane	ug/l	ND	1.0
cis-1,3-Dichloropropene	ug/l	ND	1.0
trans-1,3-Dichloropropene	ug/l	ND	1.0
Ethyl benzene	ug/l	ND	1.0
Dichloromethane (MeCl2)	ug/l	ND	2.0
1,1,2,2-Tetrachloroethane	ug/l	ND	1.0
Tetrachloroethene (PCE)	ug/l	1.1	1.0



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West & Associates Environmental Anlab I.D. AG02984 (continued)

TEST PARAMETER	UNITS	TEST RESULT	DETECTION LIMIT

Multicomponent analysis: EPA 624 VOLATILE ORGANICS (continued)			
Toluene	ug/l	ND	1.0
1,1,1-Trichloroethane (1,1,1-TCA)	ug/l	ND	1.0
1,1,2-Trichloroethane (1,1,2-TCA)	ug/l	ND	1.0
Trichloroethene (TCE)	ug/l	ND	1.0
Trichlorofluoromethane (Freon-11)	ug/l	ND	1.0
Vinyl chloride (VC)	ug/l	ND	2.0
Xylenes	ug/l	ND	1.0

Anlab I.D. AG02985

SAMPLE DESCRIPTION: MW-6

Sample collection date: 02/13/97

Lab submittal date: 02/14/97

Turn-Around-Time: REG

Client Code: 891

Matrix: W

Time:

Time: 10:41

Sample Disposal: LAB

TEST PARAMETER	UNITS	TEST RESULT	DETECTION LIMIT

Multicomponent analysis: Gas (8015)/BTX&E (8020) EPA 5030			
Gasoline	ug/l	25	20
Benzene	ug/l	0.54	0.50
Toluene	ug/l	ND	0.50
Xylene	ug/l	ND	0.50
Ethylbenzene	ug/l	ND	0.50

Multicomponent analysis: EPA 624 VOLATILE ORGANICS

Surrogate 1 (1,2-DCA-d4)	ug/l	98	76-118
Surrogate 2 (Toluene-d8)	ug/l	105	92-109
Surrogate 3 (4-BFB)	ug/l	108	83-112
Benzene	ug/l	ND	1.0
Bromodichloromethane	ug/l	ND	1.0
Bromoform	ug/l	ND	1.0
Bromomethane	ug/l	ND	1.0
Carbon tetrachloride	ug/l	ND	1.0
Chlorobenzene	ug/l	ND	1.0
Chloroethane	ug/l	ND	1.0
2-Chloroethylvinyl ether	ug/l	ND	2.0
Chloroform	ug/l	ND	1.0
Chloromethane	ug/l	ND	1.0



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West & Associates Environmental Anlab I.D. AG02985 (continued)

TEST PARAMETER	UNITS	TEST RESULT	DETECTION LIMIT

Multicomponent analysis: EPA 624 VOLATILE ORGANICS (continued)			
Dibromochloromethane	ug/l	ND	1.0
1,2-Dichlorobenzene (o-DCB)	ug/l	ND	1.0
1,3-Dichlorobenzene (m-DCB)	ug/l	ND	1.0
1,4-Dichlorobenzene (p-DCB)	ug/l	ND	1.0
1,1-Dichloroethane (1,1-DCA)	ug/l	16	1.0
1,2-Dichloroethane (1,2-DCA)	ug/l	4.1	1.0
1,1-Dichloroethene (1,1-DCE)	ug/l	ND	1.0
trans-1,2-Dichloroethene	ug/l	ND	1.0
1,2-Dichloropropane	ug/l	ND	1.0
cis-1,3-Dichloropropene	ug/l	ND	1.0
trans-1,3-Dichloropropene	ug/l	ND	1.0
Ethyl benzene	ug/l	ND	1.0
Dichloromethane (MeCl2)	ug/l	ND	2.0
1,1,2,2-Tetrachloroethane	ug/l	ND	1.0
Tetrachloroethene (PCE)	ug/l	1.6	1.0
Toluene	ug/l	ND	1.0
1,1,1-Trichloroethane (1,1,1-TCA)	ug/l	ND	1.0
1,1,2-Trichloroethane (1,1,2-TCA)	ug/l	ND	1.0
Trichloroethene (TCE)	ug/l	1.7	1.0
Trichlorofluoromethane (Freon 11)	ug/l	ND	1.0
Vinyl chloride (VC)	ug/l	ND	2.0
Xylenes	ug/l	ND	1.0

Anlab I.D. AG02986

SAMPLE DESCRIPTION: MW-7

Sample collection date: 02/13/97

Lab submittal date: 02/14/97

Turn-Around-Time: REG

Client Code: 891

Matrix: W

Time:

Time: 10:41

Sample Disposal: LAB

TEST PARAMETER	UNITS	TEST RESULT	DETECTION LIMIT

Multicomponent analysis: TPH by Modified 8015			
Petroleum Hydrocarbon as Diesel	mg/l	3.8	0.050
Pet. Hydrocarbon as Motor Oil	mg/l	ND	0.50



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Anlab I.D. AG02987
SAMPLE DESCRIPTION: MW-10
 Sample collection date: 02/13/97
 Lab submittal date: 02/14/97
 Turn-Around-Time: REG

Client Code: 891
 Matrix: W
 Time:
 Time: 10:41
 Sample Disposal: LAB

TEST PARAMETER	UNITS	TEST RESULT	DETECTION LIMIT

Multicomponent analysis: Gas(8015)/BTX&E(8020) EPA 5030			
Gasoline	ug/l	ND	20
Benzene	ug/l	ND	0.50
Toluene	ug/l	ND	0.50
Xylene	ug/l	ND	0.50
Ethylbenzene	ug/l	ND	0.50

Multicomponent analysis: EPA 824 VOLATILE ORGANICS			
Surrogate 1 (1,2-DCA-d4)	ug/l	96	76-118
Surrogate 2 (Toluene-d8)	ug/l	105	92-109
Surrogate 3 (4-BFB)	ug/l	107	83-112
Benzene	ug/l	ND	1.0
Bromodichloromethane	ug/l	ND	1.0
Bromoform	ug/l	ND	1.0
Bromomethane	ug/l	ND	1.0
Carbon tetrachloride	ug/l	ND	1.0
Chlorobenzene	ug/l	ND	1.0
Chloroethane	ug/l	ND	1.0
2-Chloroethylvinyl ether	ug/l	ND	2.0
Chloroform	ug/l	ND	1.0
Chloromethane	ug/l	ND	1.0
Dibromochloromethane	ug/l	ND	1.0
1,2-Dichlorobenzene (o-DCB)	ug/l	ND	1.0
1,3-Dichlorobenzene (m-DCB)	ug/l	ND	1.0
1,4-Dichlorobenzene (p-DCB)	ug/l	ND	1.0
1,1-Dichloroethane (1,1-DCA)	ug/l	ND	1.0
1,2-Dichloroethane (1,2-DCA)	ug/l	ND	1.0
1,1-Dichloroethene (1,1-DCE)	ug/l	ND	1.0
trans-1,2-Dichloroethene	ug/l	ND	1.0
1,2-Dichloropropane	ug/l	ND	1.0
cis-1,3-Dichloropropene	ug/l	ND	1.0
trans-1,3-Dichloropropene	ug/l	ND	1.0
Ethyl benzene	ug/l	ND	1.0
Dichloromethane (MeCl2)	ug/l	ND	2.0
1,1,2,2-Tetrachloroethane	ug/l	ND	1.0
Tetrachloroethene (PCE)	ug/l	ND	1.0



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West & Associates Environmental Anlab ID# AG02987 (continued)

TEST PARAMETER	UNITS	TEST RESULT	DETECTION LIMIT
Multicomponent analysis: EPA 624 VOLATILE ORGANICS (continued)			
Toluene	ug/l	ND	1.0
1,1,1-Trichloroethane (1,1,1-TCA)	ug/l	ND	1.0
1,1,2-Trichloroethane (1,1,2-TCA)	ug/l	ND	1.0
Trichloroethene (TCE)	ug/l	ND	1.0
Trichlorofluoromethane (Freon 11)	ug/l	ND	1.0
Vinyl chloride (VC)	ug/l	ND	2.0
Xylenes	ug/l	ND	1.0

Anlab I.D. AG02988

SAMPLE DESCRIPTION: MW-11

Sample collection date: 02/13/97

Lab submittal date: 02/14/97

Turn-Around-Time: REG

Client Code: 891

Matrix: W

Time:

Time: 10:41

Sample Disposal: LAB

TEST PARAMETER	UNITS	TEST RESULT	DETECTION LIMIT
Multicomponent analysis: Gas(8015)/BTX&E(8020) EPA 5030			
Gasoline	ug/l	ND	20
Benzene	ug/l	ND	0.50
Toluene	ug/l	ND	0.50
Xylene	ug/l	ND	0.50
Ethylbenzene	ug/l	ND	0.50

Multicomponent analysis: EPA 624 VOLATILE ORGANICS

Surrogate 1 (1,2-DCA-d4)	ug/l	97	76-118
Surrogate 2 (Toluene-d8)	ug/l	104	92-109
Surrogate 3 (4-BFB)	ug/l	110	83-112
Benzene	ug/l	ND	1.0
Bromodichloromethane	ug/l	ND	1.0
Bromoform	ug/l	ND	1.0
Bromomethane	ug/l	ND	1.0
Carbon tetrachloride	ug/l	ND	1.0
Chlorobenzene	ug/l	ND	1.0
Chloroethane	ug/l	ND	1.0
2-Chloroethylvinyl ether	ug/l	ND	2.0
Chloroform	ug/l	ND	1.0
Chloromethane	ug/l	ND	1.0



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West & Associates Environmental Anlab ID AG02988 (continued)

TEST PARAMETER	UNITS	TEST RESULT	DETECTION LIMIT

Multicomponent analysis: EPA 624 VOLATILE ORGANICS (continued)			
Dibromochloromethane	ug/l	ND	1.0
1,2-Dichlorobenzene (o-DCB)	ug/l	ND	1.0
1,3-Dichlorobenzene (m-DCB)	ug/l	ND	1.0
1,4-Dichlorobenzene (p-DCB)	ug/l	ND	1.0
1,1-Dichloroethane (1,1-DCA)	ug/l	ND	1.0
1,2-Dichloroethane (1,2-DCA)	ug/l	ND	1.0
1,1-Dichloroethene (1,1-DCE)	ug/l	ND	1.0
trans-1,2-Dichloroethene	ug/l	ND	1.0
1,2-Dichloropropane	ug/l	ND	1.0
cis-1,3-Dichloropropene	ug/l	ND	1.0
trans-1,3-Dichloropropene	ug/l	ND	1.0
Ethyl benzene	ug/l	ND	1.0
Dichloromethane (MeCl ₂)	ug/l	ND	2.0
1,1,2,2-Tetrachloroethane	ug/l	ND	1.0
Tetrachloroethene (PCE)	ug/l	ND	1.0
Toluene	ug/l	ND	1.0
1,1,1-Trichloroethane (1,1,1-TCA)	ug/l	ND	1.0
1,1,2-Trichloroethane (1,1,2-TCA)	ug/l	ND	1.0
Trichloroethene (TCE)	ug/l	ND	1.0
Trichlorofluoromethane (Freon 11)	ug/l	ND	1.0
Vinyl chloride (VC)	ug/l	ND	2.0
Xylenes	ug/l	ND	1.0



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Anlab I.D. AG02989
 SAMPLE DESCRIPTION: MW-12
 Sample collection date: 02/13/97
 Lab submittal date: 02/14/97
 Turn-Around-Time: REG

Client Code: 891
 Matrix: W
 Time:
 Time: 10:41
 Sample Disposal: LAB

TEST PARAMETER	UNITS	TEST RESULT	DETECTION LIMIT

Multicomponent analysis: Gas(8015)/BTX&E(8020) EPA 5030			
Gasoline	ug/l	ND	20
Benzene	ug/l	ND	0.50
Toluene	ug/l	ND	0.50
Xylene	ug/l	ND	0.50
Ethylbenzene	ug/l	ND	0.50

Multicomponent analysis: EPA 624 VOLATILE ORGANICS			
Surrogate 1 (1,2-DCA-d4)	ug/l	99	76-118
Surrogate 2 (Toluene-d8)	ug/l	105	92-109
Surrogate 3 (4-BFB)	ug/l	109	83-112
Benzene	ug/l	ND	1.0
Bromodichloromethane	ug/l	ND	1.0
Bromoform	ug/l	ND	1.0
Bromomethane	ug/l	ND	1.0
Carbon tetrachloride	ug/l	ND	1.0
Chlorobenzene	ug/l	ND	1.0
Chloroethane	ug/l	ND	1.0
2-Chloroethylvinyl ether	ug/l	ND	2.0
Chloroform	ug/l	ND	1.0
Chloromethane	ug/l	ND	1.0
Dibromochloromethane	ug/l	ND	1.0
1,2-Dichlorobenzene (o-DCB)	ug/l	ND	1.0
1,3-Dichlorobenzene (m-DCB)	ug/l	ND	1.0
1,4-Dichlorobenzene (p-DCB)	ug/l	ND	1.0
1,1-Dichloroethane (1,1-DCA)	ug/l	ND	1.0
1,2-Dichloroethane (1,2-DCA)	ug/l	3.2	1.0
1,1-Dichloroethene (1,1-DCE)	ug/l	ND	1.0
trans-1,2-Dichloroethene	ug/l	ND	1.0
1,2-Dichloropropane	ug/l	ND	1.0
cis-1,3-Dichloropropene	ug/l	ND	1.0
trans-1,3-Dichloropropene	ug/l	ND	1.0
Ethyl benzene	ug/l	ND	1.0
Dichloromethane (MeCl2)	ug/l	ND	2.0
1,1,2,2-Tetrachloroethane	ug/l	ND	1.0
Tetrachloroethene (PCE)	ug/l	4.3	1.0



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West & Associates Environmental Anlab ID AG02989 (continued)

TEST PARAMETER	UNITS	TEST RESULT	DETECTION LIMIT

Multicomponent analysis: EPA 624 VOLATILE ORGANICS (continued)			
Toluene	ug/l	ND	1.0
1,1,1-Trichloroethane (1,1,1-TCA)	ug/l	ND	1.0
1,1,2-Trichloroethane (1,1,2-TCA)	ug/l	ND	1.0
Trichloroethene (TCE)	ug/l	ND	1.0
Trichlorofluoromethane (Freon 11)	ug/l	ND	1.0
Vinyl chloride (VC)	ug/l	ND	2.0
Xylenes	ug/l	ND	1.0

ND = Not Detected

* Increased detection limit due to dilution. Sample matrix interfered with analyte quantitation when analyzed undiluted.

Notes: The surrogate results are in percent recovery units. The detection limit field represents the acceptable quality control range for recoveries. Surrogates are organic compounds that are similar in chemical composition to the target analyte, but are not normally found in environmental samples. The surrogate is used to track method efficiency and does not represent a compound result.

Method blanks ND.

See Attachment A for dates of analysis.

Sample comments:

Analysis: EPA 8015 Modified

Comments: The sample did not match the diesel standard chromatographic pattern. The sample eluted between the diesel standard and the motor oil standard.

Analysis: 5030

Comments: Samples AG02982-85 contained peaks in the gasoline retention time range but the peaks were not characteristic of the gasoline pattern.



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West & Associates Environmental Anlab ID AG02982-89 (continued)

Case Narrative:

Analysis: EPA 625

Problem: The following compounds are outside of the acceptable quality control limit:

<u>Compound</u>	<u>Surrogate</u>	<u>Control Limit</u>
2-fluorophenol	10	21-100
Phenol D-5	7.1	35-114

Theses two surrogates are part of the acid extractable compounds and the low recoveries do not affect the naphthalene result since this is a base neutral compound.

Data Qualification: The integrity of the analytical data was established based on the fact that acceptable quality control recoveries were obtained for the LCS, the MS/MSD compounds, and the QA/QC surrogates.

- MS = Matrix Spike
- MSD = Matrix Spike Duplicate
- LCS = Laboratory Control Standard

Report Approved By: _____
ELAP ID #: 1468

:pjb



**ATTACHMENT A
DATES OF ANALYSIS**

		BEGIN	FINISH
AG02982	Gas(8015)/BTX&E(8020) EPA 5030	02/27/97	02/27/97
AG02982	EPA 624 VOLATILE ORGANICS	02/27/97	02/27/97
AG02982	EPA 625 SEMI-VOL ORGANICS	02/18/97	03/02/97
AG02983	Gas(8015)/BTX&E(8020) EPA 5030	02/25/97	02/25/97
AG02983	EPA 624 VOLATILE ORGANICS	02/27/97	02/27/97
AG02984	Gas(8015)/BTX&E(8020) EPA 5030	02/25/97	02/25/97
AG02984	EPA 624 VOLATILE ORGANICS	02/27/97	02/27/97
AG02985	Gas(8015)/BTX&E(8020) EPA 5030	02/25/97	02/25/97
AG02985	EPA 624 VOLATILE ORGANICS	02/27/97	02/27/97
AG02986	TPH by Modified 8015	02/20/97	03/06/97
AG02987	Gas(8015)/BTX&E(8020) EPA 5030	02/25/97	02/25/97
AG02987	EPA 624 VOLATILE ORGANICS	02/27/97	02/27/97
AG02988	Gas(8015)/BTX&E(8020) EPA 5030	02/25/97	02/25/97
AG02988	EPA 624 VOLATILE ORGANICS	02/27/97	02/27/97
AG02989	Gas(8015)/BTX&E(8020) EPA 5030	02/25/97	02/25/97
AG02989	EPA 624 VOLATILE ORGANICS	02/27/97	02/27/97