PORT OF OAKLAND

November 25, 1997

Mr. Barney Chan
Alameda County Health Care Services Agency
Environmental Protection Division
1131 Harbor Bay Parkway, #250
Alameda, CA 94502-6577

SUBJECT: QUARTERLY GROUNDWATER MONITORING REPORT - FORMER TANK NUMBERS MF-25 AND MF-26, METROPOLITAN OAKLAND INTERNATIONAL AIRPORT, UNITED AIRLINES HANGAR AREA - ECONOMY PARKING LOT SITE, 1100 AIRPORT DRIVE, OAKLAND, CALIFORNIA

Dear Mr. Chan:

Enclosed is a copy of the November 17, 1997 *Groundwater Monitoring and Sampling Report -Tanks MF-25 and MF-26, United Airlines Hangar - Economy Parking Lot Site, Metropolitan Oakland International Airport (MOIA)*, 1100 Airport Drive, Oakland, California. Monitoring activities were performed by Innovative Technical Solutions, Inc. (ITSI), one of the as-needed consultants retained by the Port of Oakland (Port).

For your information, ITSI is in the process of preparing the final draft of a corrective action work plan to address the separate phase hydrocarbons which have historically been observed in the two groundwater monitoring wells, MW-2 and MW-3.

Should you have any questions or need additional information, please contact me at 272-1118. Thank you for your on-going assistance and support on this project.

Sincerely,

Dale Klettke, CHMM
Associate Environmental Scientist
Environmental Health & Safety Compliance

enclosure

cc: Rich Hiett, Regional Water Quality Control Board, San Francisco Bay Region (w/o enc)
Neil Werner - EH & SC (w/o enc)
Mark O'Brien - EH & SC (w/o enc)
Jeff Hess - ITSI (w/o enc)
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INNOVATIVE TECHNICAL SOLUTIONS, Inc.

ITSI

November 17, 1997

Project No. 95-113.28

Mr. Dale Klettke
Associate Environmental Scientist
Port of Oakland
530 Water Street
Oakland, California 94607

Groundwater Monitoring and Sampling Report
Tanks MF25 and MF26, United Airlines Hangar - Economy Parking Lot Site
Metropolitan Oakland International Airport (MOIA)
1100 Airport Drive
Oakland, California
(Work Order No. 028691)

Dear Mr. Klettke:

This Groundwater Monitoring and Sampling Report (Report) has been prepared by Innovative Technical Solutions, Inc. (ITSI) on behalf of the Port of Oakland for activities performed at the United Airlines Hangar-Economy Parking Lot Site located at 1100 Airport Drive at Metropolitan Oakland International Airport (MOIA) in Oakland, California.. Activities discussed in this Report include monitoring well redevelopment, free product sampling, and groundwater monitoring and sampling activities performed on July 30 and August 6, 1997. A site location map is shown on Figure 1.

The scope of work included redeveloping, monitoring and sampling three groundwater monitoring wells, MW-1, MW-2, and MW-3, and collecting product samples from MW-2 and MW-3 for fuel-fingerprint analysis. The monitoring wells are located in the vicinity of two former underground storage tanks (USTs); a 500-gallon oil/solvent tank (MF-25), and a 3,000-gallon oil/solvent tank (MF-26). The USTs were removed in March 1992.

PRODUCT SAMPLING AND REDEVELOPMENT OF MONITORING WELLS

Product sampling and well redevelopment activities were performed on July 30, 1997. Separate phase hydrocarbons were observed in two monitoring wells, MW-2 and MW-3. Product thickness measurements are shown on Table 1.

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Product samples were collected from MW-2 and MW-3 in the event there was insufficient product for sample collection following well redevelopment. Product samples were collected using clean disposable bailers and placed into laboratory provided containers. The sample containers were properly labeled with the sample number, date and time of collection, and sampler's initials, and were placed on ice in an insulated cooler.

Monitoring wells MW-1, MW-2 and MW-3 were then redeveloped and purged by Exploration Drilling Services using swab, surge block and bail techniques. MW-1, with no separate phase hydrocarbons, was redeveloped using a 2-inch surge block followed by purging approximately two well volumes using a clean steel bailer. Redevelopment and purging was repeated three times until the groundwater removed appeared to be relatively free of sediments.

Monitoring wells MW-2 and MW-3 were redeveloped and purged using a clean steel bailer. Separate phase hydrocarbons were removed during redevelopment using an absorbent swab. Approximately seven to eight well volumes were purged from each well until the groundwater removed appeared to be relatively free of sediments. Fine-grained sand and native soil were encountered in the bottom of MW-2, suggesting possible well damage or the absence of an end cap. MW-3 exhibited slow recharge, limiting the extent of redevelopment activities. Fresh water was introduced to the well to facilitate purging. A total of approximately 25 gallons of water were removed from the wells during purging.

SAMPLING OF MONITORING WELLS

Groundwater monitoring and sampling was performed on August 6, 1997. The monitoring wells were initially gauged for depth to water and checked for the presence of separate phase hydrocarbons. No separate phase hydrocarbons were observed in the monitoring wells. Depth to water measurements were recorded on Monitoring Well Purge and Sample Forms. Copies of the Monitoring Well Purge and Sample Forms are provided in Attachment A.

After depth to water measurements were recorded, the monitoring wells were purged using clean disposable bailers. Approximately three casing volumes of water were removed from MW-1 and MW-2. Less than three casing volumes of water were purged from MW-3 due to dewatering and slow recharge. Physical parameters, including pH, conductivity, and temperature, were measured following each purge cycle (approximately 1 casing volume). Field parameters were recorded on Monitoring Well Purge and Sample Forms. Purge water was stored in a properly labeled drum onsite.

Groundwater samples were collected from each monitoring well using the disposable bailers and placed into laboratory provided containers. The sample containers were properly labeled and placed into an iced cooler for transport to the laboratory.

The above field activities were performed in accordance with the site-specific Health and Safety Plan for groundwater monitoring and sampling activities at the site.

GROUNDWATER LEVELS IN MONITORING WELLS

Depth to water results are summarized in Table 1. Groundwater elevations were calculated using the measured depth to water and survey elevations of top of casing, and are provided in Table 1. This survey used the Port of Oakland datum, which is 3.2 feet below mean sea level. Figure 2 shows the elevation contours and groundwater flow direction for the site. The groundwater flow direction is to the northeast, with a gradient of approximately 0.0018 ft/ft.

LABORATORY ANALYSIS OF PRODUCT AND GROUNDWATER SAMPLES

The product samples, collected from MW-2 and MW-3 on July 30, 1997, were sent under chain-of-custody procedures to Curtis and Tompkins, Ltd. in Berkeley, a Port of Oakland contract laboratory. The samples were analyzed for:

- Extractable hydrocarbons (fuel-fingerprint) by Modified EPA Method 8015.
- Purgeable hydrocarbons (fuel-fingerprint) by EPA Method 8015.
- Volatile organic compounds (VOCs) by EPA Method 8260.

Copies of laboratory results, chromatograms and chain-of-custody are provided in Attachment B. The groundwater samples were sent under chain-of-custody procedures to Pace Analytical, a Port of Oakland contract laboratory, and analyzed according to the following schedule:

Monitoring Well ID	Analyses						
	TPHg[1]	BTEX[2]	TPHj[3]	TPHd[4]	TPHmo[5]	VOCs[6]	TDS[7]
MW-1	x	x	x	x	x	x	x
MW-2	x	x	x	x	x	x	x
MW-3	x	x	x	x	x	x	x

[1]Total petroleum hydrocarbons (TPH) as gasoline (TPHg) by California LUFT Method.
[2]Benzene, toluene, ethylbenzene, and xylenes (BTEX) by California LUFT Method.
[3]TPH as jet fuel by Modified EPA Method 8015 with silica gel cleanup procedure.
[4]TPH as diesel by Modified EPA Method 8015 with silica gel cleanup procedure.
[5]TPH as motor oil by Modified EPA Method 8015 with silica gel cleanup procedure.
[6]Volatile organic compounds (VOCs) by EPA Method 8010.
[7]Total dissolved solids (TDS) by EPA Method 160.1.

Laboratory results for the groundwater sample are summarized in Tables 2 and 3, and shown in Figure 3. Copies of the laboratory results, chromatograms and chain-of-custody are provided in Attachment C.

FINDINGS

Results of the July 30, 1997 product sampling are summarized below:

- Prior to well redevelopment activities, separate phase hydrocarbons were observed in two monitoring wells, MW-2 and MW-3, at a thickness of 0.14 and 0.03 feet, respectively.
- Fuel-fingerprint chromatograms for the free product samples collected from MW-2 and MW-3 were reportedly consistent with the JP-5 laboratory standard. Chromatograms for both samples also contained peaks from heavier petroleum hydrocarbons (approximately C26-C30) which did not match any of the fuel standards utilized by the laboratory.
- Toluene and ethylbenzene were reportedly detected in the MW-2 product sample at concentrations of 55 mg/l and 65 mg/l, respectively.
- Total xylenes were reportedly detected in the MW-2 and MW-3 product samples at concentrations of 340 mg/l and 380 mg/l, respectively.
- Other VOCs were reportedly not detected in the two product samples collected and analyzed.

Results of the August 6, 1997 groundwater monitoring and sampling are summarized below[1]:

- No separate phase hydrocarbons were observed in the three monitoring wells.
- TPHg was reportedly detected in the three monitoring wells at concentrations up to 9,900 µg/l (in MW-2).
- Benzene was reportedly detected in the three monitoring wells at concentrations up to 170 µg/l (in MW-2).
- Toluene, ethylbenzene and xylenes were reportedly detected in MW-2 and MW-3 at concentrations up to 270 µg/l, 92 µg/l and 410 µg/l, respectively.
- TPHj was reportedly not detected in the three monitoring wells2.
- TPHd was reportedly detected in the three monitoring wells at concentrations up to 12,000 µg/l (in MW-2).
- TPHmo was reportedly detected in MW-2 at a concentration of 2,300 µg/l.
- VOCs were reportedly detected in one or more of the monitoring wells.
  - Chloroform was reportedly detected in MW-3 at a concentration of 2.1 µg/l.
  - 1,1-Dichloroethane (1,1-DCA) was reportedly detected in the three monitoring wells at concentrations up to 69 µg/l (in MW-2).

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[1] Laboratory results represent the highest concentrations reported for either the sample or field duplicate sample.

[2] Laboratory re-evaluation of the extractable hydrocarbon chromatograms indicated a hydrocarbon pattern consistent with the JP5 laboratory standard.

- cis-1,2-dichloroethene (cis 1,2-DCE) was reportedly detected in MW-1 and MW-2 at concentrations of 19 µg/l and 160 µg/l, respectively.
- Trichloroethene (TCE) was reportedly detected in MW-1 at a concentration of 2.5 µg/l.
- Tetrachloroethene (PCE) was reportedly detected in MW-1 and MW-3 at concentrations of 0.54 µg/l and 0.62 µg/l, respectively.

• TDS was reported in MW-1, MW-2 and MW-3 at concentrations of 2,430 mg/l, 1,640 mg/l and 15,100 mg/l, respectively.

CONCLUSIONS

According to Pace Analytical personnel[3], a qualitative re-evaluation of the extractable hydrocarbon chromatograms for groundwater samples collected on July 30, 1997 indicated the presence of a hydrocarbon pattern which was consistent with the JP5 laboratory standard. Based on the results of the fuel-fingerprint analysis of the product samples and the reevaluation of the chromatograms for the groundwater samples, analytical results historically reported as TPHd may actually represent JP5. Consequently, future groundwater sampling activities should include TPH as JP5 as part of the proposed analytical schedule.

Please give us a call if you have any questions or comments.

Sincerely,

Jim Schollard
Environmental Scientist

Jeffrey D. Hess, R.G.
Project Director

Attachments

[3] Personal communication, Mr. Ron Chew, October 3, 1997.

TABLE 1

GROUNDWATER ELEVATIONS
TANKS MF25 AND MF26 (UNITED AIRLINES HANGAR-ECONOMY PARKING LOT SITE)
METROPOLITAN OAKLAND INTERNATIONAL AIRPORT (MOIA)
1100 AIRPORT DRIVE
OAKLAND, CALIFORNIA

Monitoring Well ID	Elevation of Top of Casing (feet)	Date of Monitoring	Measured Depth to Water (feet)	Product Thickness (feet)	Groundwater Elevation (feet)	Note
MW-1	6.91	5/15/92	3.10	-	3.81	1
		8/7/92	3.20	-	3.71	1
		11/24/92	4.04	-	2.87	1
		2/12/93	-	-	-	1
		3/11/93	2.09	-	4.82	1
		5/17/93	3.14	-	3.77	1
		8/3/93	3.15	-	3.76	1
		11/25/93	3.59	-	3.32	1
		3/24/94	3.21	-	3.70	1
		5/9/94	2.99	-	3.92	1
		8/29/94	3.34	-	3.57	1
		9/27/94	3.51	-	3.40	1
		4/25/95	2.38	-	4.53	1
		8/11/95	3.08	-	3.83	1
		11/3/95	3.52	-	3.39	1
		6/19/96	2.93	-	3.98	
		10/24/96	3.52	-	3.39	
		1/22/97	2.61	-	4.30	
		4/25/97	2.77	-	4.14	
		8/6/97	3.27	-	3.64	
MW-2	6.63	4/25/95	2.20	-	4.43	1
		8/11/95	3.11	-	3.84	1
		11/3/95	3.28	-	3.35	1
		6/19/96	2.53	0.05	4.14	2
		10/24/96	3.44	0.16	3.31	2
		1/22/97	2.45	0.02	4.20	2
		4/25/97	2.60	0.03	4.05	2
		7/30/97	NM	0.14	NM	3
		8/6/97	2.96	-	3.67	
MW-3	7.36	4/25/95	2.78	-	4.58	1
		8/11/95	3.62	-	4.02	1
		11/3/95	4.05	-	3.63	1
		6/19/96	3.17	0.01	4.20	2
		10/24/96	4.02	0.02	3.36	2
		1/22/97	2.86	0.005	4.50	2
		4/25/97	3.13	0.01	4.24	2
		7/30/97	NM	0.03	NM	3
		8/6/97	3.76	-	3.60	

1 Data from Table 1, Results of Groundwater Sampling Analysis for Petroleum Hydrocarbons, BTEX, and TDS, Port of Oakland, Oakland International Airport, United Airlines Hangar Area-Economy Parking Lot Site, dated February 21, 1996, by Alisto Engineering Group.

2 Groundwater elevation calculated assuming a specific gravity of 0.75 for product.

3 Free product removed from well during redevelopment (July 30, 1997).

TABLE 2

SUMMARY OF LABORATORY RESULTS
TANKS MF25 AND MF26 (UNITED AIRLINES HANGAR AREA - ECONOMY PARKING LOT SITE)
METROPOLITAN OAKLAND INTERNATIONAL AIRPORT (MOIA)
1100 AIRPORT DRIVE
OAKLAND, CALIFORNIA

Monitoring Well ID	Date of Sampling	TPHg (µg/l)	B (µg/l)	T (µg/l)	E (µg/l)	X (µg/l)	TPHj (µg/l)	TPHd (µg/l)	TPHmo (µg/l)	TOG (µg/l)	TDS (mg/l)	Note
MW-1	5/15/92	<50	<0.4	<0.3	<0.3	<0.4	-	-	-	<5,000	5,900	1
	8/7/92	<50	<0.4	<0.3	<0.3	<0.4	800	-	-	<5,000	-	1
	11/24/92	<50	<0.4	<0.3	<0.3	<0.4	<50	-	-	<5,000	-	1
	2/12/93	<50	<0.4	<0.3	<0.3	<0.4	-	-	-	<5,000	-	1
	5/17/93	<50	<0.4	<0.3	<0.3	<0.4	-	-	-	<5,000	4,100	1
	8/3/93	<50	<0.5	<0.5	<0.5	<0.5	-	5,200	-	<5,000	7,700	1
	11/25/93	70	<0.5	<0.5	<0.5	0.6	-	-	-	<5,000	3,790	1
	5/9/94	<50	<0.5	<0.5	<0.5	<0.5	-	-	-	<930	9,600	1
	8/29/94	<50	<0.5	<0.5	2.7	<0.5	-	-	-	<1,000	3,900	1
	4/25/95	<50	<5	<5	<5	<5	<50	1,400	610	-	4,000	1
	8/11/95	<50	<0.4	<0.3	<0.3	<0.4	<50	1,900	1,200	-	8,500	1
	11/3/95	<50	0.4	0.4	<0.3	<0.4	<50	4,200	1,800	-	6,600	1
	6/19/96	<50	0.99	<0.5	1.1	<1.0	<500	11,000	820	-	3,040	
	10/24/96	57	1.9	<0.5	<0.5	1.3	<500	<250	<250	-	3,090	
	1/22/97	<50	<0.5	<0.5	<0.5	<1.0	<500	220[3]	<250	-	4,240	
	4/25/97*	110	1.2	<0.5	1.0	1.2	<500	<50[4]	<250	-	2,770	
	8/6/97*	100	2.1	<0.5	<0.5	<1.0	<500	340[5]	<250	-	2,430	
MW-2	4/25/95	5,200	340	570	110	580	13,000	<10,000	19,000	-	1,700	1
	8/11/95	5,500	320	680	110	510	7,900	<8,000	20,000	-	2,500	1
	11/3/95	3,800	200	400	27	360	11,000	<11,000	4,200	-	2,000	1
	6/19/96	-[2]	-[2]	-[2]	-[2]	-[2]	-[2]	-[2]	-[2]	-	-[2]	
	10/24/96	-[2]	-[2]	-[2]	-[2]	-[2]	-[2]	-[2]	-[2]	-	-[2]	
	1/22/97	-[2]	-[2]	-[2]	-[2]	-[2]	-[2]	-[2]	-[2]	-	-[2]	
	4/25/97	-[2]	-[2]	-[2]	-[2]	-[2]	-[2]	-[2]	-[2]	-	-[2]	
	8/6/97	9,900	170	270	92	410	<1,000	12,000	2,300[6]	-	1,640	

TABLE 2 (continued)

SUMMARY OF LABORATORY RESULTS
TANKS MF25 AND MF26 (UNITED AIRLINES HANGAR AREA - ECONOMY PARKING LOT SITE)
METROPOLITAN OAKLAND INTERNATIONAL AIRPORT (MOIA)
1100 AIRPORT DRIVE
OAKLAND, CALIFORNIA

Monitoring Well ID	Date of Sampling	TPHg (µg/l)	B (µg/l)	T (µg/l)	E (µg/l)	X (µg/l)	TPHj (µg/l)	TPHd (µg/l)	TPHmo (µg/l)	TOG (µg/l)	TDS (mg/l)	Note
MW-3	4/25/95	7,200	150	600	100	580	38,000	<40,000	31,000	-	5,600	1
	8/11/95	-[2]	-[2]	-[2]	-[2]	-[2]	-[2]	-[2]	-[2]	-	-[2]	1
	11/3/95	-[2]	-[2]	-[2]	-[2]	-[2]	-[2]	-[2]	-[2]	-	-[2]	1
	6/19/96	-[2]	-[2]	-[2]	-[2]	-[2]	-[2]	-[2]	-[2]	-	-[2]	
	10/24/96	-[2]	-[2]	-[2]	-[2]	-[2]	-[2]	-[2]	-[2]	-	-[2]	
	1/22/97	-[2]	-[2]	-[2]	-[2]	-[2]	-[2]	-[2]	-[2]	-	-[2]	
	4/25/97	-[2]	-[2]	-[2]	-[2]	-[2]	-[2]	-[2]	-[2]	-	-[2]	
	8/6/97	4,200	3.6	16	14	90	<500	1,400	<250	-	15,100	

* Laboratory results represent the highest concentrations reported for either the sample or field duplicate sample (QC-1).

1 Data from Table 1, Results of Groundwater Sampling Analysis for Petroleum Hydrocarbons, BTEX, and TDS, Port of Oakland, Oakland International Airport, United Airlines Hangar Area-Economy Parking Lot Site, dated February 21, 1996, by Alisto Engineering Group.

2 Not sampled due to presence of free product in monitoring well.

3 Hydrocarbons present do not match profile of laboratory standard.

4 Single analyte peak(s) are present in fuel range. Fuel hydrocarbon pattern is not present.

5 Hydrocarbons are elevated due to the presence of single analyte peak(s) in fuel quantitation range.

6 Hydrocarbons are present in the requested fuel quantitation range but do not resemble pattern of any available fuel standard. Carbon range is C23 - C36.

TABLE 3

SUMMARY OF LABORATORY RESULTS FOR VOLATILE ORGANIC COMPOUNDS
TANKS MF25 AND MF26 (UNITED AIRLINES HANGAR AREA-ECONOMY PARKING LOT SITE)
METROPOLITAN OAKLAND INTERNATIONAL AIRPORT (MOIA)
1100 AIRPORT DRIVE
OAKLAND, CALIFORNIA

Monitoring Well ID	Date of Sampling	Acetone (µg/l)	2-Butanone (µg/l)	Chloroform (µg/l)	1,1-DCA (µg/l)	(cis/trans) 1,2-DCE (µg/l)	4-Methyl-2-Pentanone (µg/l)	1,1,1-TCA (µg/l)	TCE (µg/l)	PCE (µg/l)	Note
MW-1	11/24/92	ND	ND	ND	ND	ND	ND	ND	ND	ND	1
	2/12/93	ND	ND	ND	ND	ND	ND	ND	ND	ND	1
	5/17/93	ND	ND	ND	ND	ND	ND	ND	ND	ND	1
	8/3/93	ND	ND	ND	ND	ND	ND	ND	ND	ND	1
	11/25/93	ND	ND	ND	ND	6	ND	ND	ND	ND	1
	5/9/94	ND	ND	ND	ND	ND	ND	ND	ND	5.5	1
	9/27/94	ND	ND	ND	ND	ND	ND	ND	ND	ND	1
	4/25/95	<20	<20	<5	<5	<5	<20	-	-	<5	1
	8/11/95	-	-	<0.5	4.3	13	-	2	1.8	0.6	1
	11/3/95	-	-	<0.5	1.3	3.7/<0.4	-	0.6	0.5	<0.5	1
	6/19/96	-	-	<0.5	5.4	-/<0.5	-	<0.5	1.2	<0.5	
	10/24/96	-	-	<0.5	12	-/<1.0	-	<0.5	1.4	<0.5	
	1/22/97	-	-	<0.5	3.9	8.4/<1.0	-	<0.5	1.7	<0.5	
	4/25/97*	-	-	<0.5	6.2	10/<1.0	-	<0.5	<1.2	0.62	
	8/6/97*	-	-	<0.5	14	19/<1.0	-	<0.5	2.5	0.54	
MW-2	4/25/95	<200	200	<50	50	<50	<200	-	-	<50	1
	8/11/95	-	-	5	79	26	-	20	4	9	1
	11/3/95	-	-	<0.5	73	24/<0.4	-	4.8	6.7	6.8	1
	6/19/96	[2]	[2]	[2]	[2]	[2]	[2]	[2]	[2]	[2]	
	10/24/96	[2]	[2]	[2]	[2]	[2]	[2]	[2]	[2]	[2]	
	1/22/97	[2]	[2]	[2]	[2]	[2]	[2]	[2]	[2]	[2]	
	4/25/97	[2]	[2]	[2]	[2]	[2]	[2]	[2]	[2]	[2]	
	8/6/97	-	-	<5	69	160/<10	-	<5	<12	<5	

TABLE 3 (continued)

SUMMARY OF LABORATORY RESULTS FOR VOLATILE ORGANIC COMPOUNDS
TANKS MF25 AND MF26 (UNITED AIRLINES HANGAR AREA-ECONOMY PARKING LOT SITE)
METROPOLITAN OAKLAND INTERNATIONAL AIRPORT (MOIA)
1100 AIRPORT DRIVE
OAKLAND, CALIFORNIA

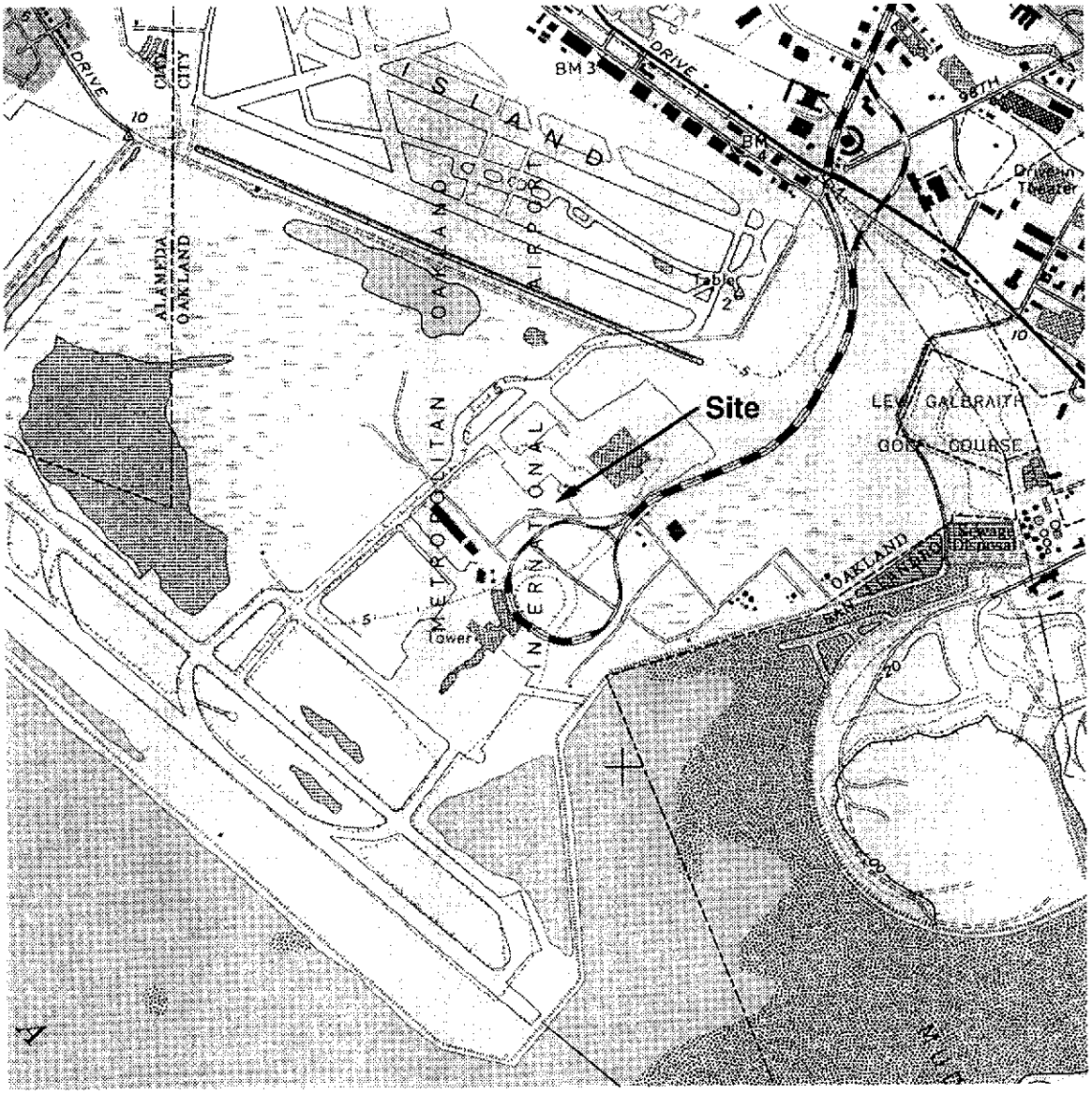
Monitoring Well ID	Date of Sampling	Acetone (µg/l)	2-Butanone (µg/l)	Chloroform (µg/l)	1,1-DCA (µg/l)	(cis/trans) 1,2-DCE (µg/l)	4-Methyl-2-Pentanone (µg/l)	1,1,1-TCA (µg/l)	TCE (µg/l)	PCE (µg/l)	Note
MW-3	4/25/95	300	300	-	30	<30	200	-	-	<30	1
	8/11/95	-[2]	-[2]	-[2]	-[2]	-[2]	-[2]	-[2]	-[2]	-[2]	1
	11/3/95	-[2]	-[2]	-[2]	-[2]	-[2]	-[2]	-[2]	-[2]	-[2]	1
	6/19/96	-[2]	-[2]	-[2]	-[2]	-[2]	-[2]	-[2]	-[2]	-[2]	
	10/24/96	-[2]	-[2]	-[2]	-[2]	-[2]	-[2]	-[2]	-[2]	-[2]	
	1/22/97	-[2]	-[2]	-[2]	-[2]	-[2]	-[2]	-[2]	-[2]	-[2]	
	4/25/97	-[2]	-[2]	-[2]	-[2]	-[2]	-[2]	-[2]	-[2]	-[2]	
	8/6/97	-	-	2.1	3.8	<0.5/<1	-	<0.5	<1.2	0.62	

* Lab results reported from the highest concentrations detected in the sample or in the field duplicate sample (QC-1).

1 Data from Table 1, Results of Groundwater Sampling Analysis for Petroleum Hydrocarbons, BTEX, and TDS, Port of Oakland, Oakland International Airport, United Airlines Hangar Area Economy Parking Lot Site, dated February 21, 1996, by Alisto Engineering Group.

2 Not sampled due to presence of free product in monitoring well.

95-113.03/F.1-SiteLoc



0 1,000 Feet 2,000 Feet

Approximate Scale

Source: San Leandro, California 7.5-minute U.S.G.S. Quadrangle, dated 1959, and photorevised 1980.

FIGURE 1

SITE LOCATION

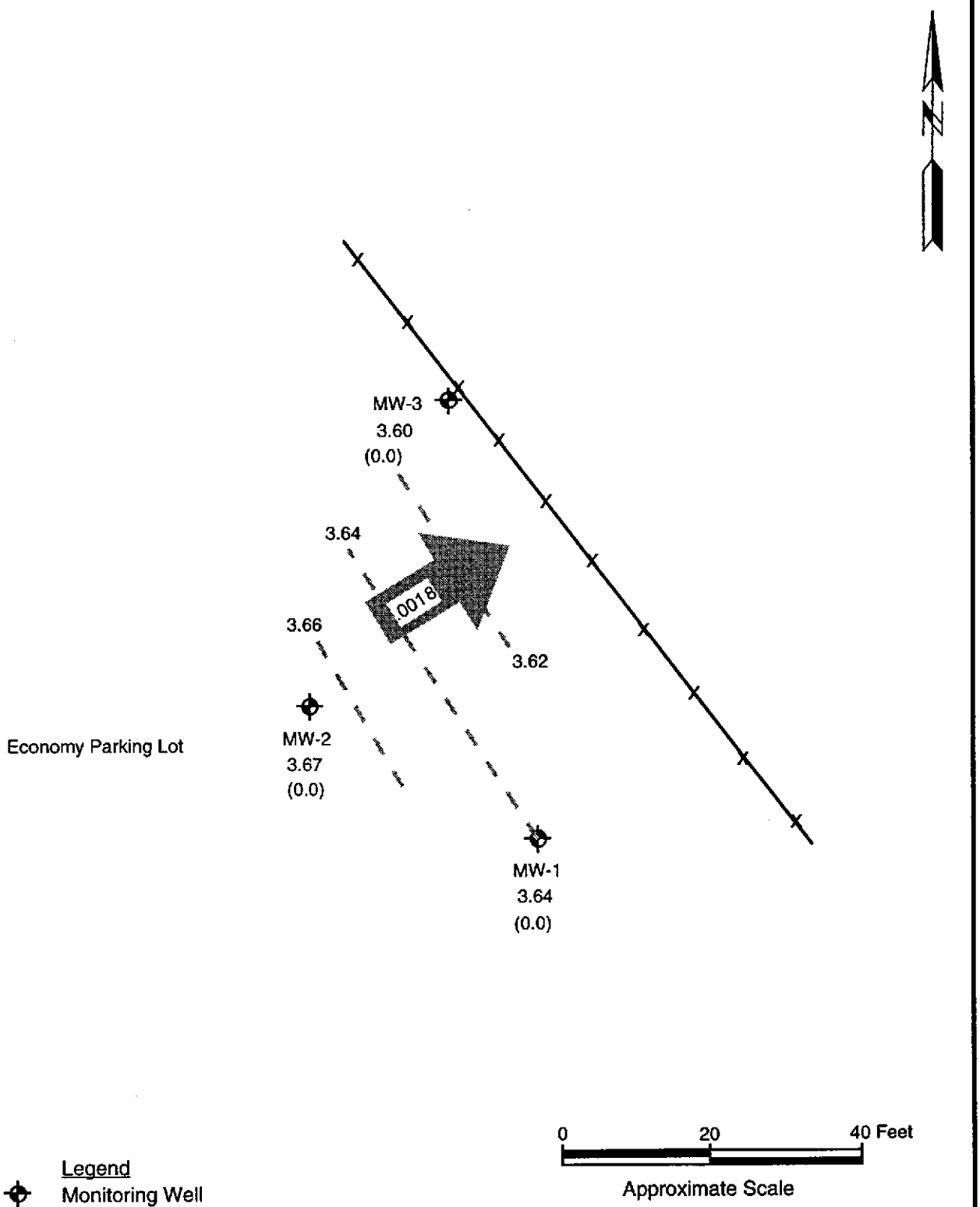
United Airlines Hangar-Economy Parking Lot Site
Oakland International Airport
1100 Airport Drive

PORT OF OAKLAND

ITSI

INNOVATIVE TECHNICAL SOLUTIONS, INC.

95-113.28/F.2-GWElev



Source: Adapted from Figure 2, Potentiometric Groundwater Elevation Contour Map, November 3, 1995, Alisto Engineering Group.

FIGURE 2

GROUNDWATER ELEVATIONS AND FLOW DIRECTION FOR AUGUST 6, 1997

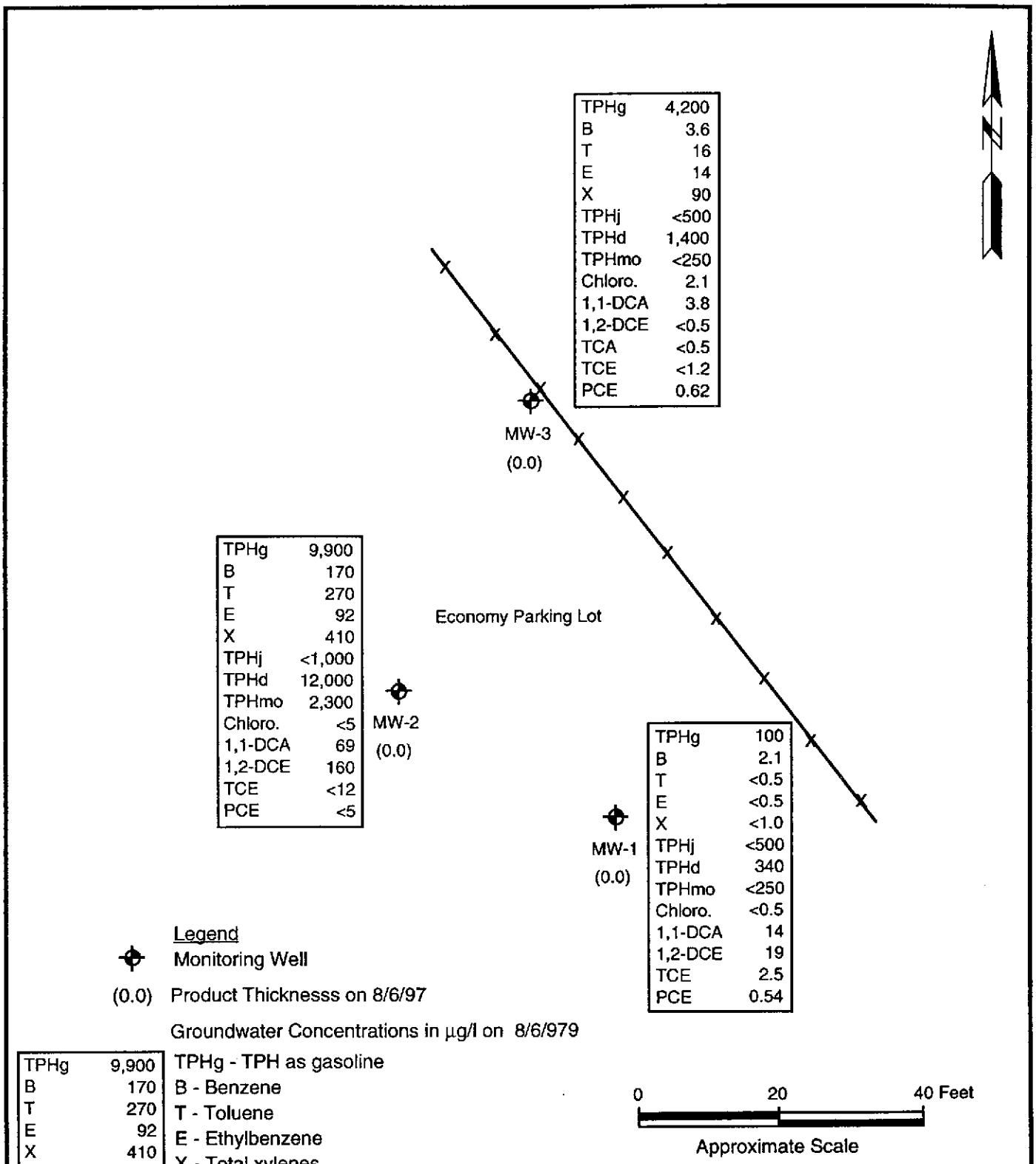
United Airlines Hangar-Economy Parking Lot Site
Oakland International Airport
1100 Airport Drive

PORT OF OAKLAND

ITSI

INNOVATIVE TECHNICAL SOLUTIONS, INC.

95-113.28/F.3-Conc



Source: Adapted from Figure 2, Potentiometric Groundwater Elevation Contour Map, November 3, 1995, Alisto Engineering Group.

FIGURE 3

CONCENTRATIONS OF PETROLEUM HYDROCARBONS AND VOCs IN GROUNDWATER ON AUGUST 6,1997

United Airlines Hangar-Economy Parking Lot Site
Oakland International Airport
1100 Airport Drive

PORT OF OAKLAND

ITSI

INNOVATIVE TECHNICAL SOLUTIONS, INC.

ATTACHMENT A

COPIES OF MONITORING WELL PURGE AND SAMPLE FORMS

Purge & Sample

MONITORING WELL DEVELOPMENT FORM

PROJECT NAME: P/o Economy Parking PROJECT NO.: 95-113.28

WELL NO.: MW-1 TESTED BY: W & S DATE: 8-6-97

Measuring Point Description: Mark/notch on T.O.C. Static Water Level (ft.): 3.27

Total Well Depth (ft.): 11.81 Sample Method: disposable bailer

Water Level Measurement Method: solinst dual interface probe Time Sampled: 13:15 / 13.20

Purge Method: Disposable bailer Sample Depth (ft.): < 4.0

Time Start Purge: 12:44 Field Filtering: none

Time End Purge: 13:00 Field Preservation: Blue ice

Comments: Collected duplicate sample, MW-1a @ 13.20

CHECKED BY: _____

Well Volume Calculation (fill in before purging)	Total Depth (ft)	-	Depth to Water (ft)	=	Water Column (ft)	x	Multiplier for Casing Diameter (in)			=	Casing Volume (gal)
	11.8	-	3.27	=	8.53	x	2	4	6	=	1.36 (3 Vols = 4.08 gallons)
							0.16	0.64	1.44		

Time	12:49	12:55	13:00				
Volume Purged (gallons)	1.5	1.5	1.5				
Cumulative Volume Purged (gallons)	1.5	3.0	4.5				
Cumulative Number of Casing Volumes	1.10	2.20	3.30				
Purge Rate (gpm)	0.33	0.25	0.33				
Temperature (~~F~~) C°	26.0	25.0	25.0				
pH	7.07	7.10	7.09				
Specific Conductivity (µmhos/cm) X 1000	7.0	6.5	6.0				
Dissolved Oxygen (mg/L)	—	—					
Turbidity/Color (NTU)	Very Slightly Turbid/cloudy	→	→				
Odor	none	none	none				
Dewatered?	NO	NO	NO				

ITSI

MONITORING WELL DEVELOPMENT FORM

PROJECT NAME: P/O Economy Parking PROJECT NO.: 95-113.28

WELL NO.: MW-2 TESTED BY: CURS JJ DATE: 8-6-97

Measuring Point Description: Notch in Toc Static Water Level (ft.): 2.96

Total Well Depth (ft.): 11.50 Sample Method: disposable bailer

Water Level Measurement Method: Dual interface probe Time Sampled: 14:40

Purge Method: Disposable bailer Sample Depth (ft.): ∠ 4.0

Time Start Purge: 14:17 Field Filtering: —

Time End Purge: 14:27 Field Preservation: Blue Ice

Comments: no measurable product, Thick sheen Seen on Top of purge water.

CHECKED BY: _____

Well Volume Calculation (fill in before purging)	Total Depth (ft)	-	Depth to Water (ft)	=	Water Column (ft)	x	Multiplier for Casing Diameter (in)			=	Casing Volume (gal)
	11.50	-	2.96	=	8.5	x	2	4	6	=	1.37 (4.10 = 3 vols.)
							0.16	0.64	1.44		

Time	14:19	1425	14:27				
Volume Purged (gallons)	1.0	2.5	1.0				
Cumulative Volume Purged (gallons)	1.0	3.5	4.5				
Cumulative Number of Casing Volumes	.72	2.6	3.3				
Purge Rate (gpm)	0.5	0.4	0.5				
Temperature (F°)	28	28.0	27.3				
pH	6.83	6.76	6.78				
Specific Conductivity (µmhos/cm) x (100)	4.0	3.5	3.0				
Dissolved Oxygen (mg/L)	—	—	—				
Turbidity/Color (NTU)	Very Slightly Turbid	→	→				
Odor	diesel	diesel	→				
Dewatered?	no	no	no				

ITSI

MONITORING WELL DEVELOPMENT FORM

PROJECT NAME: P/O Economy Parking PROJECT NO.: 95-113.28

WELL NO.: MW-3 TESTED BY: WLS DATE: 8-6-97

Measuring Point Description: Notch on Toc Static Water Level (ft.): 3.76

Total Well Depth (ft.): 11.16 Sample Method: disposable bailer

Water Level Measurement Method: dual interface probe Time Sampled: 13:50

Purge Method: disposable bailer Sample Depth (ft.): 10 TO 11.16

Time Start Purge: 13:40 Field Filtering: —

Time End Purge: 13:48 Field Preservation: Blue Ice

Comments: no measurable floating product, only evacuated 1.3 well volumes due to extremely slow recharge rate.

CHECKED BY: _____

Well Volume Calculation (fill in before purging)	Total Depth (ft)	-	Depth to Water (ft)	=	Water Column (ft)	x	Multiplier for Casing Diameter (in)			=	Casing Volume (gal)
							2	4	6		1.18 (3.5 = 3 vols.)
	11.16	-	3.76	=	7.4	x	0.16	0.64	1.44	=	

Time	13:42	13:48					
Volume Purged (gallons)	0.75	0.75					
Cumulative Volume Purged (gallons)	0.75	1.5					
Cumulative Number of Casing Volumes	.6	1.3					
Purge Rate (gpm)	0.37	0.12					
Temperature (F°)	24.6	23.2					
pH	7.78	7.61					
Specific Conductivity (µmhos/cm) x 1000	22.0	24.3					
Dissolved Oxygen (mg/L)	—	—					
Turbidity/Color (NTU)	Dark gray to black color	→					
Odor	Diesel / Yes	→					
Dewatered?	—	Yes					

ITSI

ATTACHMENT B

COPIES OF LABORATORY REPORTS, CHROMATOGRAMS AND CHAIN-OF-CUSTODY FORM FOR PRODUCT SAMPLES

Curtis & Tompkins, Ltd., Analytical Laboratories, Since 1878
2323 Fifth Street, Berkeley, CA 94710, Phone (510) 486-0900

ANALYTICAL REPORT

Prepared for:

Innovative Technical Solutions, Inc.
2855 Mitchell Drive
Suite 118
Walnut Creek, CA 94598

Date: 20-AUG-97
Lab Job Number: 130199
Project ID: 95-113.28
Location: P/O Economy Parking

Reviewed by: Damara Moore

Reviewed by:

Curtis & Tompkins, Ltd.

Laboratory Number: 130199
Client: Innovative Technical Solutions
Project ID: 95-113.28
Location: P/O Economy Parking

Sample Date: 07/30/97
Receipt Date: 07/30/97

EXTRACTABLE HYDROCARBONS FINGERPRINT

Client Sample ID	Curtis & Tompkins ID
MW-2	130199-001
MW-3	130199-002

On 8/14/97, the above samples were analyzed for extractable hydrocarbons by EPA modified 8015. Fuel identification is based on comparing the pattern of peaks observed in the sample at various retention time windows to the pattern observed in the same ranges for known fuel standards. This peak pattern is sometimes referred to as the hydrocarbon "fingerprint".

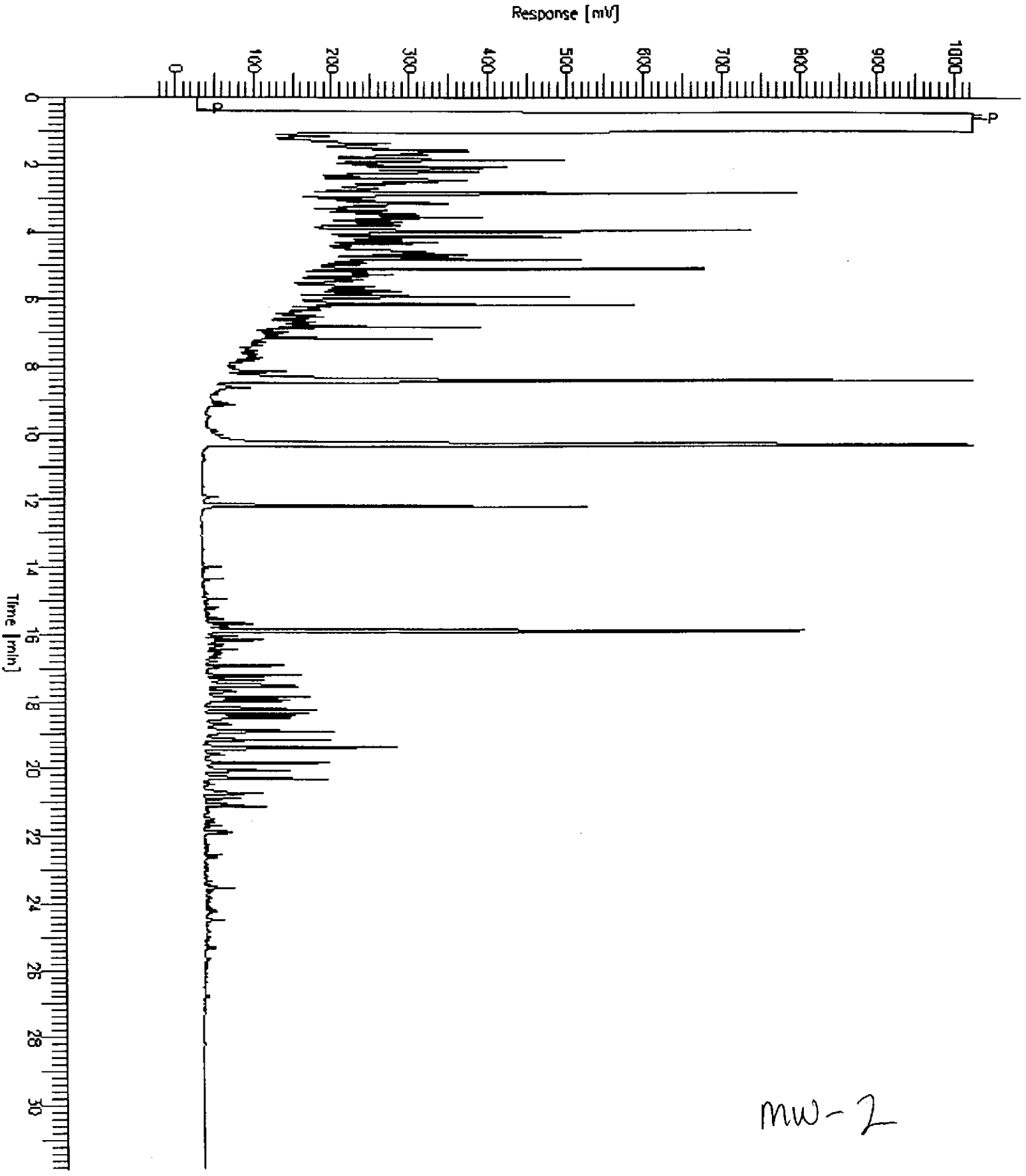
The chromatograms for both samples match our JP-5 standard. Both samples also have peaks that are late-eluting (approxiamately C26-C30). This pattern is not identifiable as matching any of our fuel standards.

Chromatograms for the samples and standards are attached.

Chromatogram

Sample Name : FP 130199-001
FileName : G:\GC13\CHA\223A064.RAW
Method : ATEH217.MTH
Start Time : 0.00 min End Time : 31.90 min
Scale Factor: 0.0 Plot Offset: -25 mV

Sample #: 130199-001 Page 1 of 1
Date : 8/14/97 10:38 AM
Time of Injection: 8/13/97 03:20 AM
Low Point : -24.52 mV High Point : 1024.00 mV
Plot Scale: 1048.5 mV

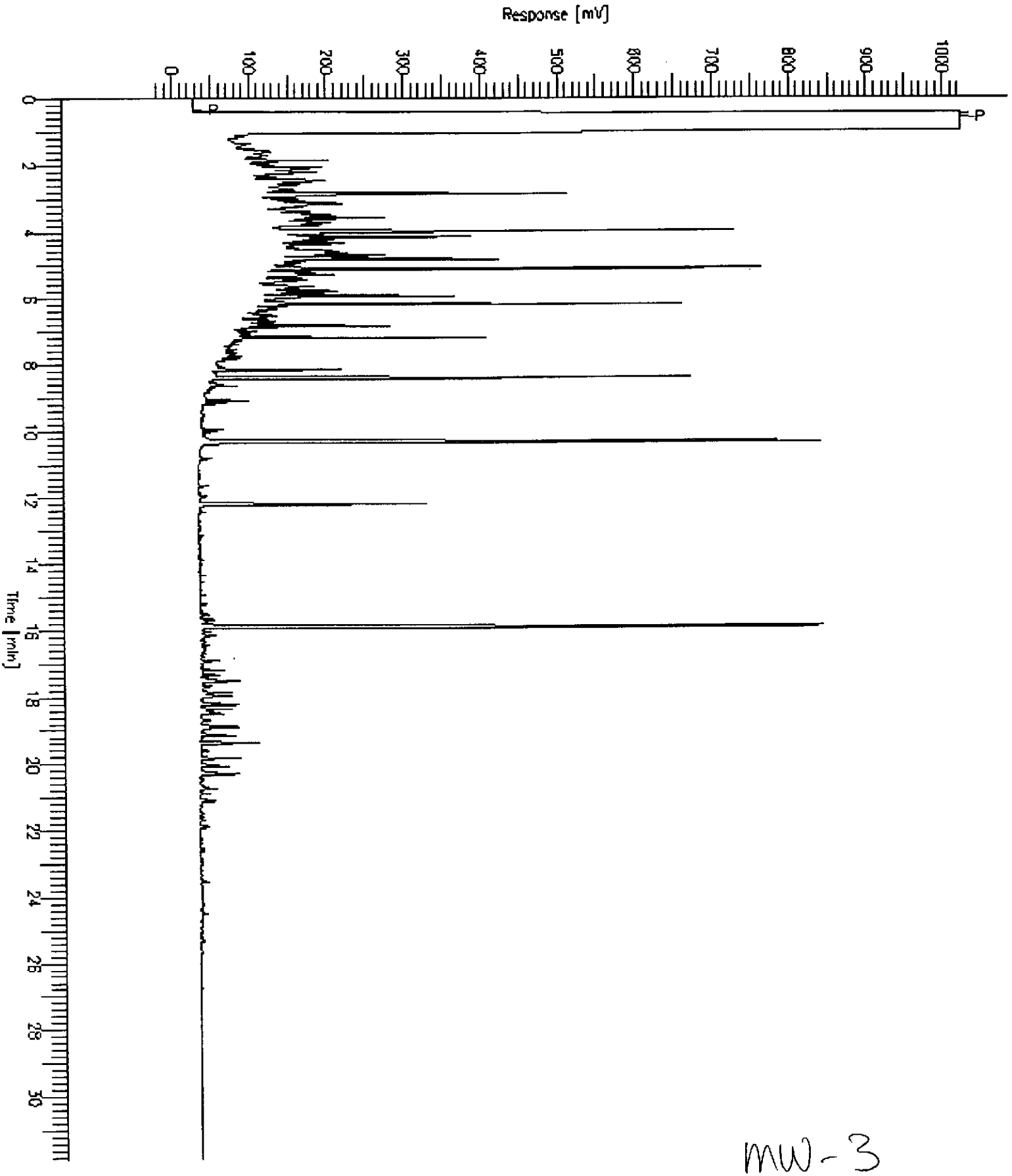


MW-2

Chromatogram

Sample Name : FP 130199-002
FileName : G:\GC13\CHA\223A065.RAW
Method : ATEH217.MTH
Start Time : 0.00 min End Time : 31.90 min
Scale Factor: 0.0 Plot Offset: -25 mV

Sample #: 130199-002 Page 1 of 1
Date : 8/14/97 10:38 AM
Time of Injection: 8/13/97 04:02 AM
Low Point : -24.61 mV High Point : 1024.00 mV
Plot Scale: 1048.6 mV

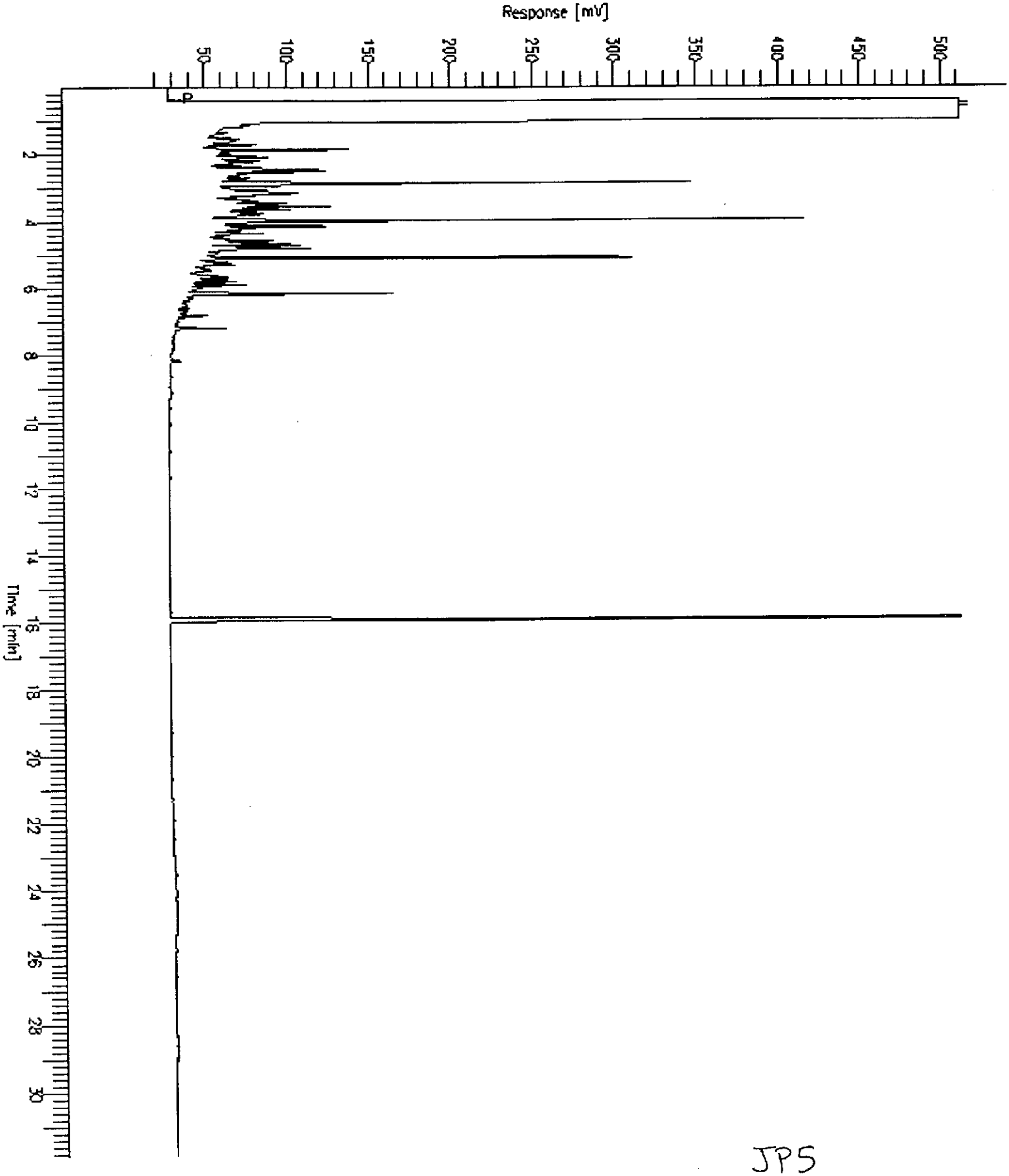


MW-3

Chromatogram

Sample Name : CCV,97WS3996,JP5
FileName : G:\GC13\CHA\223A011.RAW
Method : ATEH217.MTH
Start Time : 0.01 min End Time : 31.91 min
Scale Factor: 0.0 Plot Offset: 19 mV

Sample #: 250MG/L
Date : 8/14/97 10:49 AM
Time of Injection: 8/11/97 09:01 PM
Low Point : 18.55 mV High Point : 511.72 mV
Plot Scale: 493.2 mV

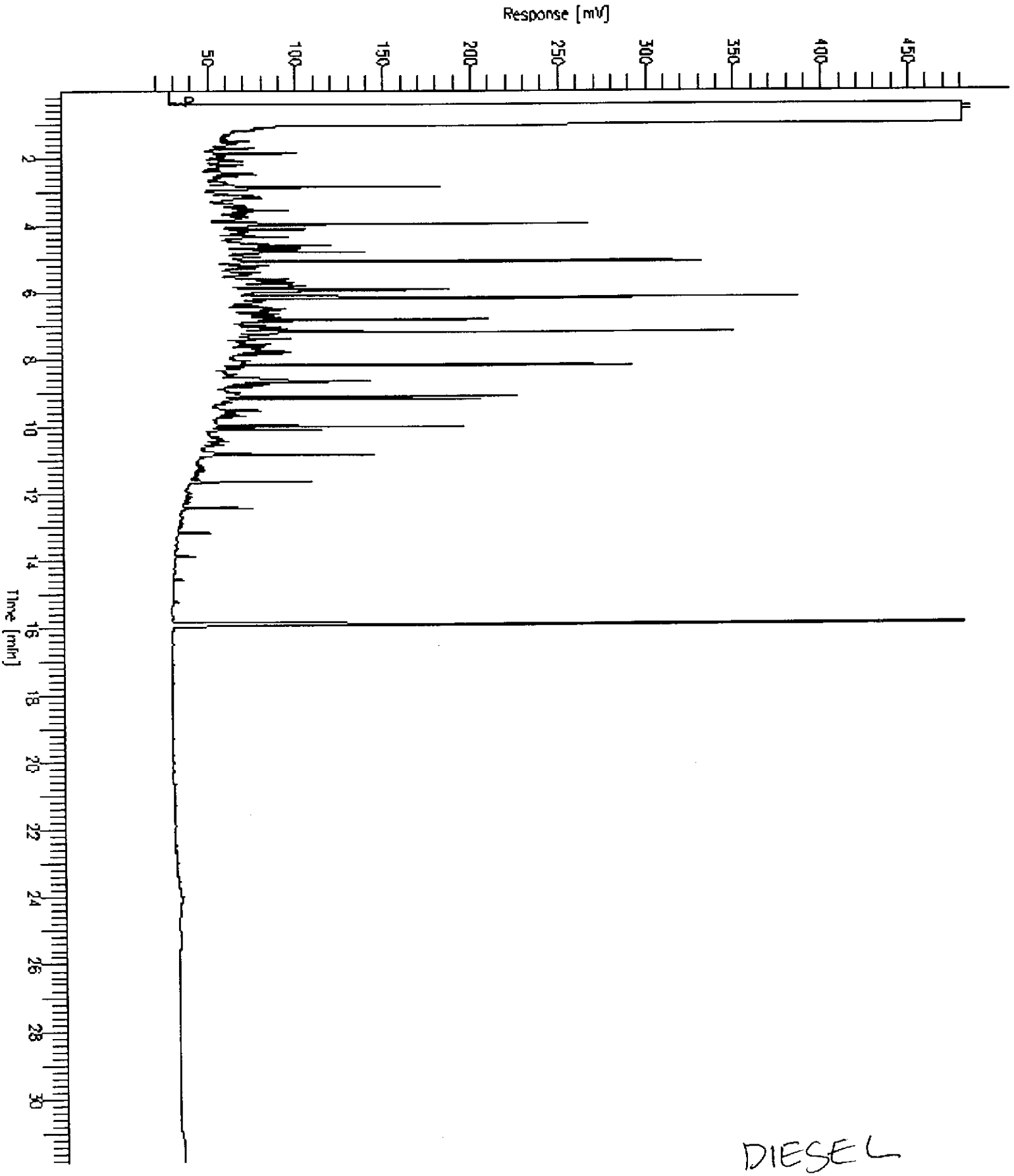


JP5

Chromatogram

Sample Name : CCV,97WS4549,DS
FileName : G:\GC13\CHA\223A008.RAW
Method : ATEH217.MTH
Start Time : 0.01 min End Time : 31.91 min
Scale Factor: 0.0 Plot Offset: 18 mV

Sample #: 500MG/L
Date : 8/14/97 10:48 AM
Time of Injection: 8/11/97 06:55 PM
Low Point : 18.38 mV High Point : 480.87 mV
Plot Scale: 462.5 mV

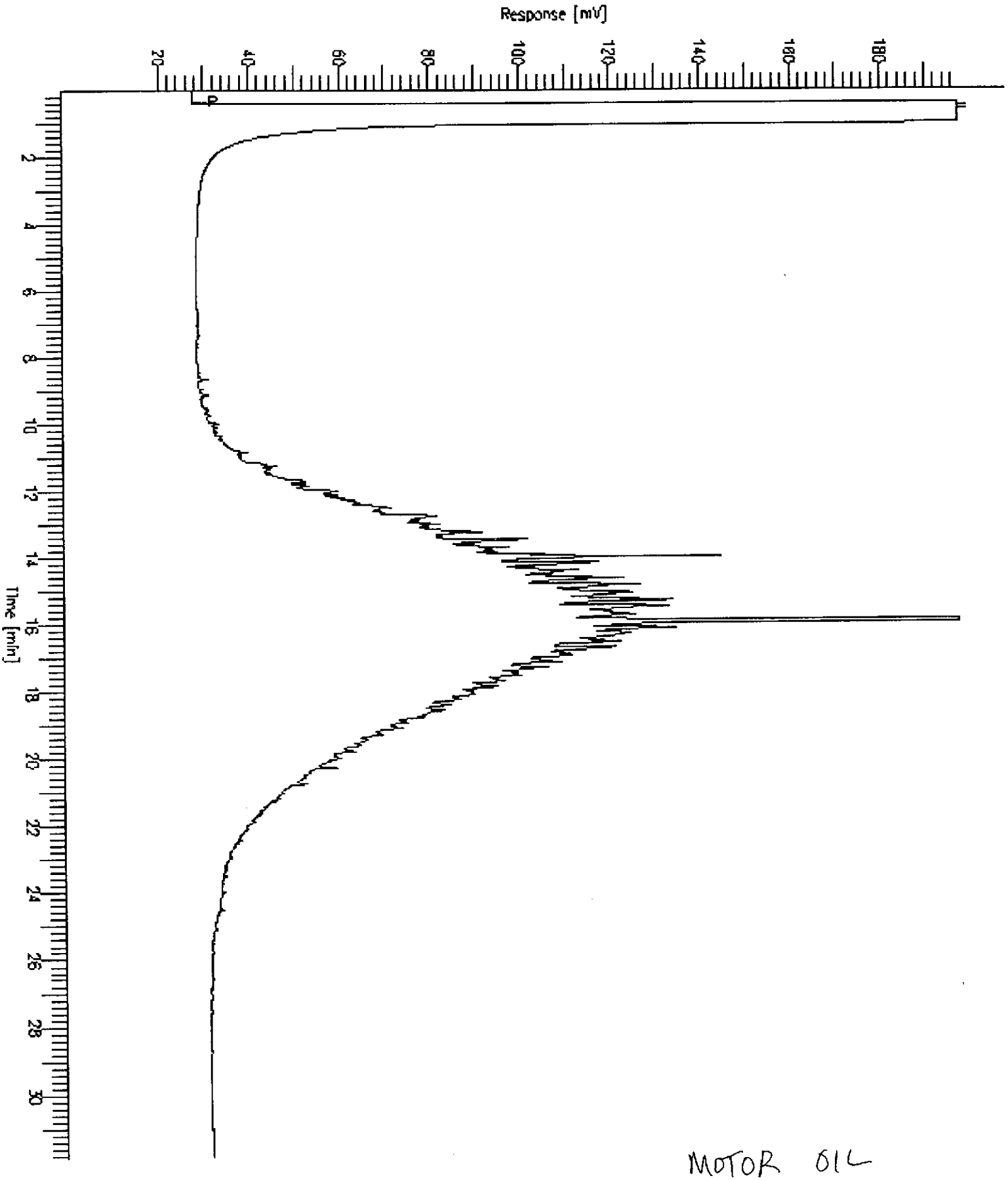


DIESEL

Chromatogram

Sample Name : CCV,97WS4154,MO
FileName : G:\GC13\CHA\223A010.RAW
Method : ATEH217.MTH
Start Time : 0.01 min End Time : 31.91 min
Scale Factor: 0.0 Plot Offset: 19 mV

Sample #: 500MG/L
Date : 8/14/97 10:49 AM
Time of Injection: 8/11/97 08:19 PM
Low Point : 18.62 mV High Point : 197.56 mV
Plot Scale: 178.9 mV



MOTOR OIL

Curtis & Tompkins, Ltd.

Laboratory Number: 130199
Client: Innovative Technical Solutions
Project ID: 95-113.28
Location: P/O Economy Parking

Sample Date: 07/30/97
Receipt Date: 07/30/97

PURGEABLE HYDROCARBONS FINGERPRINT

Client Sample ID	Curtis & Tompkins ID
MW-2	130199-001
MW-3	130199-002

On 8/14/97, the above samples were analyzed for purgeable hydrocarbons by EPA 8015. Fuel identification is based on comparing the pattern of peaks observed in the sample at various retention time windows to the pattern observed in the same ranges for known fuel standards. This peak pattern is sometimes referred to as the hydrocarbon "fingerprint".

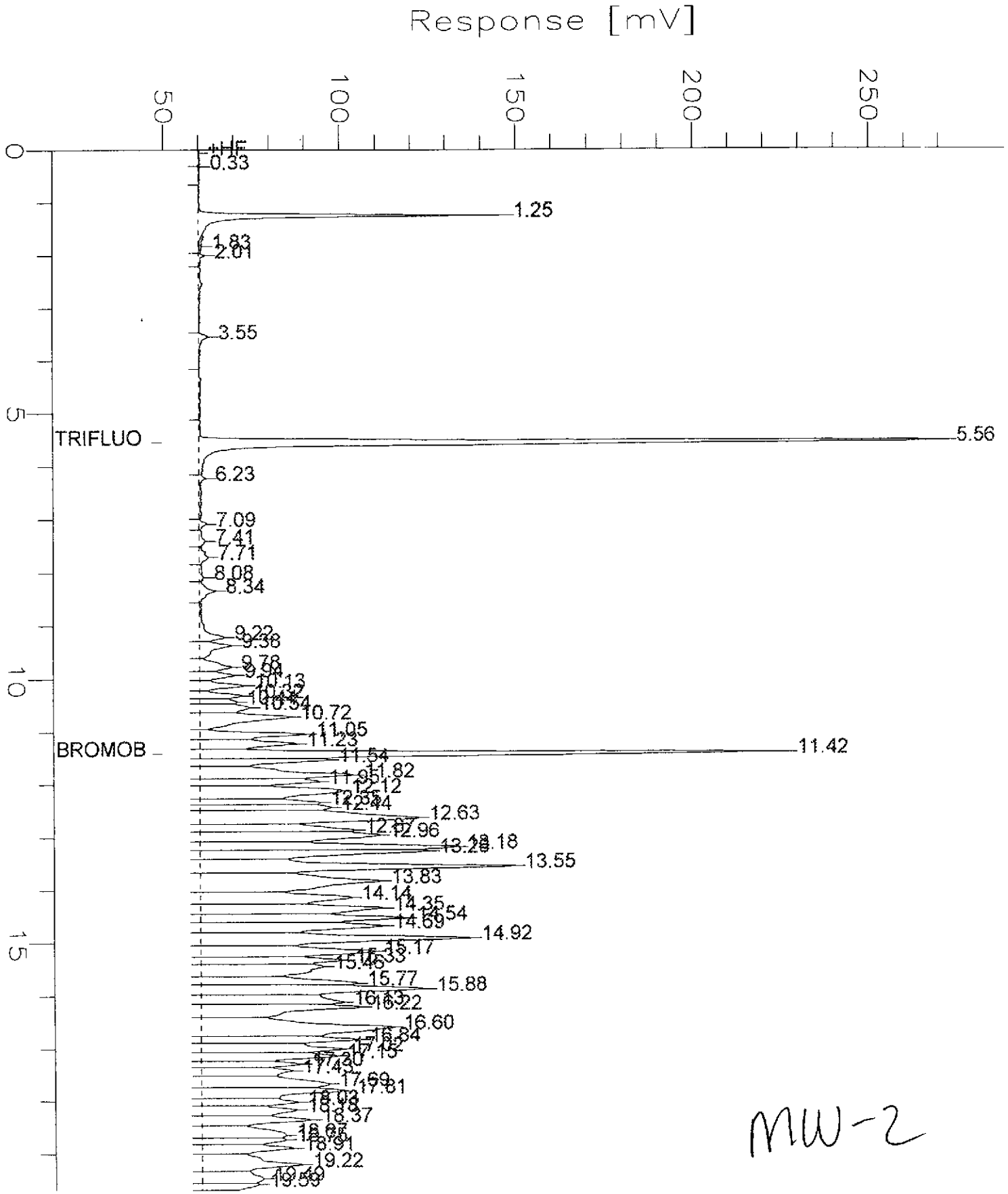
The chromatograms for both samples exhibit peaks predominantly in the range of C10 and up. The sample chromatograms do not resemble any of our purgeable hydrocarbon standards.

Chromatograms for the samples and a gasoline standard are attached.

GC04 TVH 'J' Data File Rtx1FID

Sample Name : DL,130199-001,35613,
FileName : G:\GC04\DATA\225J007.raw
Method : J_080697
Start Time : 0.00 min End Time : 19.70 min
Scale Factor: 1.0 Plot Offset: 49 mV

Sample #: Page 1 of 1
Date : 8/13/97 01:33 PM
Time of Injection: 8/13/97 01:14 PM
Low Point : 49.39 mV High Point : 272.21 mV
Plot Scale: 222.8 mV

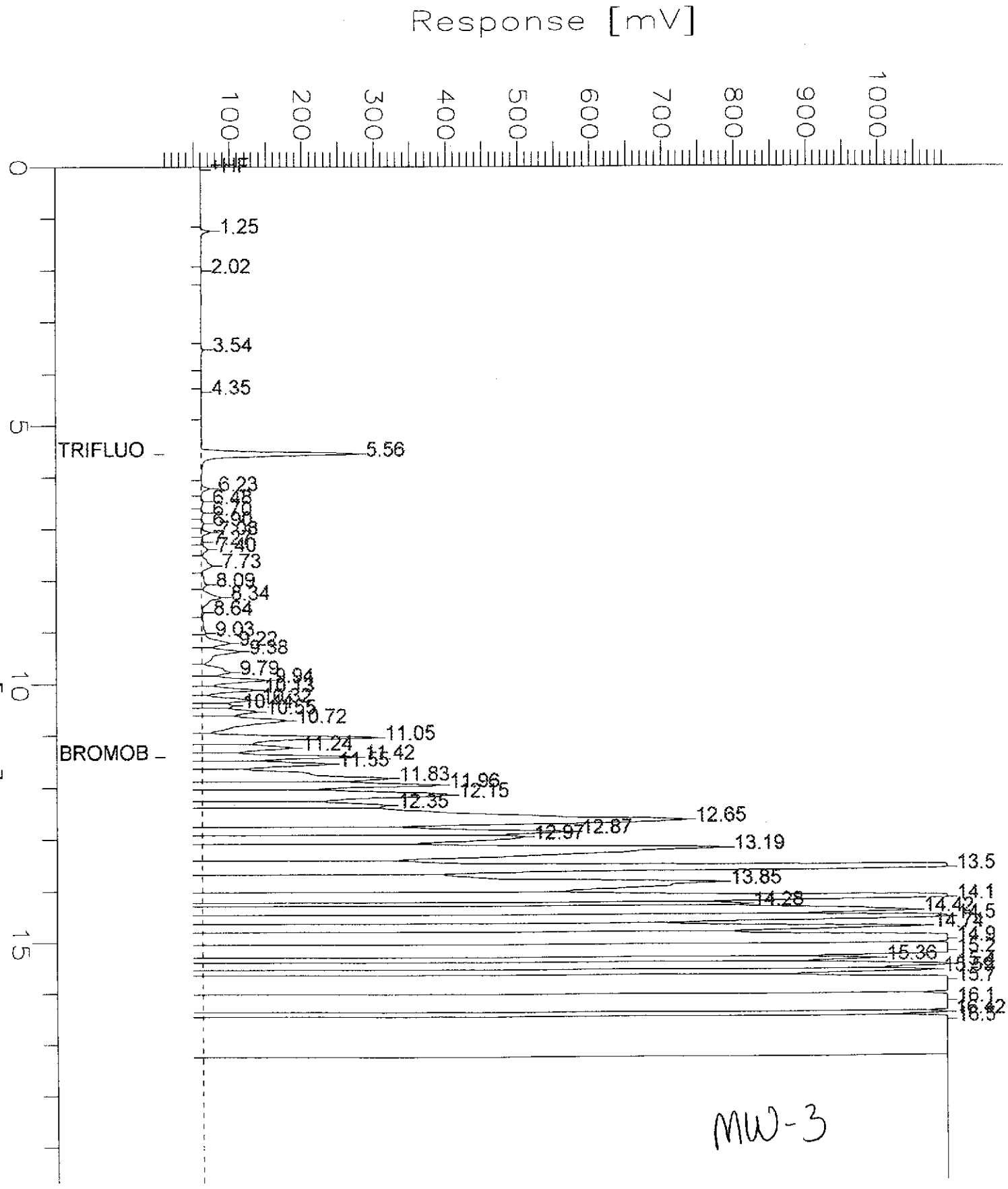


MW-2

GC04 TVH 'J' Data File Rtx1FID

Sample Name : DL,130199-002,35613,
FileName : G:\GC04\DATA\225J009.raw
Method : J_080697
Start Time : 0.00 min End Time : 19.70 min
Scale Factor: 1.0 Plot Offset: 8 mV

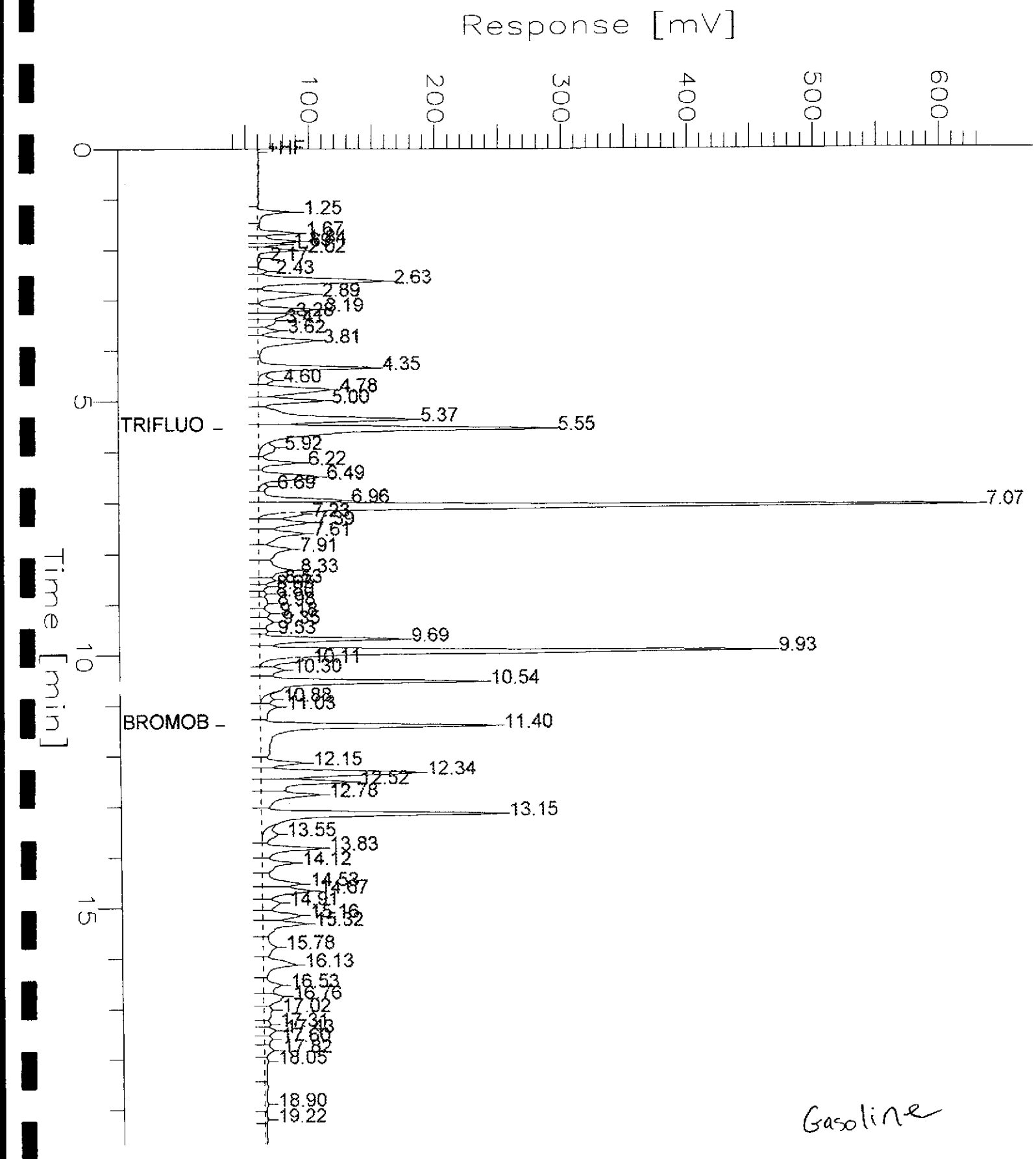
Sample #:
Date : 8/13/97 02:46 PM
Time of Injection: 8/13/97 02:26 PM
Low Point : 8.02 mV High Point : 1094.51 mV
Plot Scale: 1086.5 mV



GC04 TVH 'J' Data File Rtx1FID

Sample Name : CCV/LCS,QC51998,97WS4392,35613,
FileName : G:\GC04\DATA\225J002.raw
Method : J_080697
Start Time : 0.00 min End Time : 19.70 min
Scale Factor: 1.0 Plot Offset: 32 mV

Sample #: GAS
Date : 8/13/97 01:10 PM
Time of Injection: 8/13/97 10:13 AM
Low Point : 31.76 mV High Point : 630.13 mV
Plot Scale: 598.4 mV



Gasoline

Volatile Organics by GC/MS

Client: Innovative Technical Solutions, Inc.
Project#: 95-113.28
Location: P/O Economy Parking

Analysis Method: EPA 8260
Prep Method: EPA 5030

Field ID: MW-2
Lab ID: 130199-001
Matrix: Miscell.
Batch#: 35679
Units: ug/Kg
Diln Fac: 10000

Sampled: 07/30/97
Received: 08/07/97
Extracted: 08/16/97
Analyzed: 08/16/97

Analyte	Result	Reporting Limit
Chloromethane	ND	100000
Bromomethane	ND	100000
Vinyl Chloride	ND	100000
Chloroethane	ND	100000
Methylene Chloride	ND	200000
Acetone	ND	200000
Carbon Disulfide	ND	50000
Trichlorofluoromethane	ND	50000
1,1-Dichloroethene	ND	50000
1,1-Dichloroethane	ND	50000
trans-1,2-Dichloroethene	ND	50000
cis-1,2-Dichloroethene	ND	50000
Chloroform	ND	50000
Freon 113	ND	50000
1,2-Dichloroethane	ND	50000
2-Butanone	ND	100000
1,1,1-Trichloroethane	ND	50000
Carbon Tetrachloride	ND	50000
Vinyl Acetate	ND	500000
Bromodichloromethane	ND	50000
1,2-Dichloropropane	ND	50000
cis-1,3-Dichloropropene	ND	50000
Trichloroethene	ND	50000
Dibromochloromethane	ND	50000
1,1,2-Trichloroethane	ND	50000
Benzene	ND	50000
trans-1,3-Dichloropropene	ND	50000
Bromoform	ND	50000
2-Hexanone	ND	100000
4-Methyl-2-Pentanone	ND	100000
1,1,2,2-Tetrachloroethane	ND	50000
Tetrachloroethene	ND	50000
Toluene	55000	50000
Chlorobenzene	ND	50000
Ethylbenzene	65000	50000
Styrene	ND	50000
m,p-Xylenes	210000	50000
o-Xylene	130000	50000

Surrogate	%Recovery	Recovery Limits
1,2-Dichloroethane-d4	97	68-126
Toluene-d8	99	87-125
Bromofluorobenzene	107	79-122

Volatile Organics by GC/MS

Client: Innovative Technical Solutions, Inc.
Project#: 95-113.28
Location: P/O Economy Parking

Analysis Method: EPA 8260
Prep Method: EPA 5030

Field ID: MW-3
Lab ID: 130199-002
Matrix: Miscell.
Batch#: 35679
Units: ug/Kg
Diln Fac: 5000

Sampled: 07/30/97
Received: 08/07/97
Extracted: 08/16/97
Analyzed: 08/16/97

Analyte	Result	Reporting Limit
Chloromethane	ND	50000
Bromomethane	ND	50000
Vinyl Chloride	ND	50000
Chloroethane	ND	50000
Methylene Chloride	ND	100000
Acetone	ND	100000
Carbon Disulfide	ND	25000
Trichlorofluoromethane	ND	25000
1,1-Dichloroethene	ND	25000
1,1-Dichloroethane	ND	25000
trans-1,2-Dichloroethene	ND	25000
cis-1,2-Dichloroethene	ND	25000
Chloroform	ND	25000
Freon 113	ND	25000
1,2-Dichloroethane	ND	25000
2-Butanone	ND	50000
1,1,1-Trichloroethane	ND	25000
Carbon Tetrachloride	ND	25000
Vinyl Acetate	ND	250000
Bromodichloromethane	ND	25000
1,2-Dichloropropane	ND	25000
cis-1,3-Dichloropropene	ND	25000
Trichloroethene	ND	25000
Dibromochloromethane	ND	25000
1,1,2-Trichloroethane	ND	25000
Benzene	ND	25000
trans-1,3-Dichloropropene	ND	25000
Bromoform	ND	25000
2-Hexanone	ND	50000
4-Methyl-2-Pentanone	ND	50000
1,1,2,2-Tetrachloroethane	ND	25000
Tetrachloroethene	ND	25000
Toluene	ND	25000
Chlorobenzene	ND	25000
Ethylbenzene	ND	25000
Styrene	ND	25000
m,p-Xylenes	25000 J	25000
o-Xylene	13000 J	25000

Surrogate	%Recovery	Recovery Limits
1,2-Dichloroethane-d4	99	68-126
Toluene-d8	100	87-125
Bromofluorobenzene	96	79-122

J: Estimated Value

Lab #: 130199

BATCH QC REPORT

Curtis & Tompkins, Ltd.

EPA 8240 Volatile Organics

Client: Innovative Technical Solutions,Inc.
Project#: 95-113.28
Location: P/O Economy Parking

Analysis Method: EPA 8260
Prep Method: EPA 5030

METHOD BLANK

Matrix: Water
Batch#: 35679
Units: ug/L
Diln Fac: 1

Prep Date: 08/15/97
Analysis Date: 08/15/97

MB Lab ID: QC52252

Analyte	Result	Reporting Limit
Chloromethane	ND	10
Bromomethane	ND	10
Vinyl Chloride	ND	10
Chloroethane	ND	10
Methylene Chloride	ND	20
Acetone	ND	20
Carbon Disulfide	ND	5.0
Trichlorofluoromethane	ND	5.0
1,1-Dichloroethene	ND	5.0
1,1-Dichloroethane	ND	5.0
trans-1,2-Dichloroethene	ND	5.0
cis-1,2-Dichloroethene	ND	5.0
Chloroform	ND	5.0
Freon 113	ND	5.0
1,2-Dichloroethane	ND	5.0
2-Butanone	ND	10
1,1,1-Trichloroethane	ND	5.0
Carbon Tetrachloride	ND	5.0
Vinyl Acetate	ND	50
Bromodichloromethane	ND	5.0
1,2-Dichloropropane	ND	5.0
cis-1,3-Dichloropropene	ND	5.0
Trichloroethene	ND	5.0
Dibromochloromethane	ND	5.0
1,1,2-Trichloroethane	ND	5.0
Benzene	ND	5.0
trans-1,3-Dichloropropene	ND	5.0
Bromoform	ND	5.0
2-Hexanone	ND	10
4-Methyl-2-Pentanone	ND	10
1,1,2,2-Tetrachloroethane	ND	5.0
Tetrachloroethene	ND	5.0
Toluene	ND	5.0
Chlorobenzene	ND	5.0
Ethylbenzene	ND	5.0
Styrene	ND	5.0
m,p-Xylenes	ND	5.0
o-Xylene	ND	5.0

Surrogate	%Rec	Recovery Limits
1,2-Dichloroethane-d4	98	68-126
Toluene-d8	98	87-125
Bromofluorobenzene	97	79-122

Lab #: 130199

BATCH QC REPORT

Curtis & Tompkins, Ltd.

EPA 8240 Volatile Organics

Client: Innovative Technical Solutions, Inc.
Project#: 95-113.28
Location: P/O Economy Parking

Analysis Method: EPA 8260
Prep Method: EPA 5030

LABORATORY CONTROL SAMPLE

Matrix: Water
Batch#: 35679
Units: ug/L
Diln Fac: 1

Prep Date: 08/15/97
Analysis Date: 08/15/97

LCS Lab ID: QC52251

Analyte	Result	Spike Added	%Rec #	Limits
1,1-Dichloroethene	44.32	50	89	51-180
Trichloroethene	47.02	50	94	73-141
Benzene	48.07	50	96	78-142
Toluene	49.16	50	98	76-150
Chlorobenzene	48.24	50	96	83-129

Surrogate	%Rec	Limits
1,2-Dichloroethane-d4	98	68-126
Toluene-d8	98	87-125
Bromofluorobenzene	98	79-122

Column to be used to flag recovery and RPD values with an asterisk
* Values outside of QC limits
Spike Recovery: 0 out of 5 outside limits

Lab #: 130199

BATCH QC REPORT

Curtis & Tompkins, Ltd.

EPA 8240 Volatile Organics

Client: Innovative Technical Solutions, Inc.
Project#: 95-113.28
Location: P/O Economy Parking

Analysis Method: EPA 8260
Prep Method: EPA 5030

MATRIX SPIKE/MATRIX SPIKE DUPLICATE

Field ID: ZZZZZZ
Lab ID: 130250-002
Matrix: Water
Batch#: 35679
Units: ug/L
Diln Fac: 1

Sample Date: 08/11/97
Received Date: 08/12/97
Prep Date: 08/15/97
Analysis Date: 08/15/97

MS Lab ID: QC52325

Analyte	Spike Added	Sample	MS	%Rec #	Limits
1,1-Dichloroethene	50	<5	42.5	85	51-180
Trichloroethene	50	<5	44.6	89	73-141
Benzene	50	<5	46.38	93	78-142
Toluene	50	<5	47.53	95	76-150
Chlorobenzene	50	<5	46.24	92	83-129

Surrogate	%Rec	Limits
1,2-Dichloroethane-d4	103	68-126
Toluene-d8	98	87-125
Bromofluorobenzene	95	79-122

MSD Lab ID: QC52326

Analyte	Spike Added	MSD	%Rec #	Limits	RPD #	Limit
1,1-Dichloroethene	50	43.54	87	51-180	2	22
Trichloroethene	50	46.09	92	73-141	3	24
Benzene	50	47.64	95	78-142	3	21
Toluene	50	48.73	97	76-150	2	21
Chlorobenzene	50	47.21	94	83-129	2	21

Surrogate	%Rec	Limits
1,2-Dichloroethane-d4	103	68-126
Toluene-d8	98	87-125
Bromofluorobenzene	95	79-122

Column to be used to flag recovery and RPD values with an asterisk
* Values outside of QC limits
RPD: 0 out of 5 outside limits
Spike Recovery: 0 out of 10 outside limits

INNOVATIVE TECHNICAL SOLUTIONS, Inc.

ITSI
1330 Broadway, Suite 1625
Oakland, California 94612
(510) 286-8888 (Tel), (510) 286-8889 (Fax)

130199

PROJECT NAME: PIO Economy Parking
PROJECT NUMBER: 95-113.28
SITE LOCATION: MOFA, Oakland CA

CHAIN OF CUSTODY

DATE: 8-7-97
PAGE: 1 of 1

SAMPLE I.D.	SAMPLE DEPTH	DATE	TIME	NUMBER OF CONTAINERS	TYPE OF CONTAINERS	SAMPLE MATRIX	ANALYSIS: TPH as Gas/BTEX - 8015/8020	TPH as Diesel - 8015	TPH as Diesel - 8015 (w/ Silica Gel Cleanup)	TEPH - 8015	TEPH-8015 (w/ Silica Gel Cleanup)	TRPH - 418.1	Oil and Grease - 5520	Purgeable Halocarbons -601/8010	VOCs -624/8240	SVOCs -625/8270	LUFT Metals (Cd, Cr, Ni, Pb, Zn)	CAM 17 Metals	Finger Print Fuel Hydrocarbon Range		
MW-2	—	7-30-97	10:37	1	VOA	Product									X				X		
MW-3	—	7-30-97	12:10	1	VOA	Water									X				X		
TOTAL NUMBER OF CONTAINERS					TOTAL TESTS																

Curtis & Tompkins

W.O. # 028691

SPECIAL INSTRUCTIONS/COMMENTS

Please give best interpretation of petrolem hydrocarbon species.

SAMPLED BY: William K Scott
SIGNATURE: William K Scott

SPECIAL INSTRUCTIONS/COMMENTS: Standard TAT, Please provide chromatograms. For specifics please contact Jeff Hess 256-8898

RELINQUISHED BY: William K Scott William K Scott
Printed Name Signature
ITSI 8-7-97/13:53
Company Date and Time

RECEIVED BY: Damara Moore DAMARA MOORE
Printed Name Signature
C+T 8/7/97 12:53
Company Date and Time

RELINQUISHED BY: _____
Printed Name Signature
_____
Company Date and Time

RECEIVED BY: _____
Printed Name Signature
_____
Company Date and Time

RELINQUISHED BY: _____
Printed Name Signature
_____
Company Date and Time

RECEIVED BY: _____
Printed Name Signature
_____
Company Date and Time

SEND RESULTS TO: _____

ATTACHMENT C

COPIES OF LABORATORY REPORTS, CHROMATOGRAMS AND CHAIN-OF-CUSTODY FORM FOR GROUNDWATER SAMPLES

Pace Analytical Services, Inc.
1455 McDowell Blvd. North, Suite D
Petaluma, CA 94954
Tel: 707-792-1865
Fax: 707-792-0342

Pace Analytical

August 20, 1997

Mr. Jim Schollard
Innovative Technical Solutions
1330 Broadway, Suite 1625
Oakland, CA 94612

RE: Pace Project Number: 708996
Client Project ID: Economy Parking/Port of Oaklan

Dear Mr. Schollard:

Enclosed are the results of analyses for sample(s) received by the laboratory on August 7, 1997. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Ron Chew
Project Manager

CA ELAP Certificate Number I2245

Enclosures

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
1455 McDowell Blvd. North, Suite D
Petaluma, CA 94954
Tel: 707-792-1865
Fax: 707-792-0342

Pace Analytical

DATE: 08/20/97
PAGE: 1

Innovative Technical Solutions
1330 Broadway, Suite 1625
Oakland, CA 94612

Pace Project Number: 708996
Client Project ID: Economy Parking/Port of Oaklan

Attn: Mr. Jim Schollard
Phone: (510)286-8888

Solid results are reported on a wet weight basis

Pace Sample No: 701050759 Date Collected: 08/06/97 Matrix: Water
Client Sample ID: MW-1 Date Received: 08/07/97

Parameters	Results	Units	PRL	Analyzed	Analyst	CAS#	Footnotes
Wet Chemistry							
Total Dissolved Solids	Method: EPA 160.1				Prep Method: EPA 160.1		
Total Dissolved Solids	2430	mg/L	5	08/12/97	RVC		
GC -- Volatiles							
Volatile Halogenated Organics	Method: EPA 8010				Prep Method: EPA 8010		
Chloromethane	ND	ug/L	0.8	08/13/97	AXM	74-87-3	
Bromomethane	ND	ug/L	3	08/13/97	AXM	74-83-9	
Vinyl Chloride	ND	ug/L	1.8	08/13/97	AXM	75-01-4	
Chloroethane	ND	ug/L	5.2	08/13/97	AXM	75-00-3	
Methylene Chloride	ND	ug/L	2.5	08/13/97	AXM	75-09-2	
Trichlorofluoromethane	ND	ug/L	5	08/13/97	AXM	75-69-4	
1,1-Dichloroethene	ND	ug/L	1.3	08/13/97	AXM	75-35-4	
1,1-Dichloroethane	13	ug/L	0.7	08/13/97	AXM	75-34-3	
trans-1,2-Dichloroethene	ND	ug/L	1	08/13/97	AXM	156-60-5	
Chloroform	ND	ug/L	0.5	08/13/97	AXM	67-66-3	
1,2-Dichloroethane	ND	ug/L	0.5	08/13/97	AXM	107-06-2	
1,1,1-Trichloroethane	ND	ug/L	0.5	08/13/97	AXM	71-55-6	
Carbon Tetrachloride	ND	ug/L	1.2	08/13/97	AXM	56-23-5	
Bromodichloromethane	ND	ug/L	1	08/13/97	AXM	75-27-4	
1,2-Dichloropropane	ND	ug/L	0.5	08/13/97	AXM	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	3.4	08/13/97	AXM	10061-01-5	
Trichloroethene	2.3	ug/L	1.2	08/13/97	AXM	79-01-6	
Dibromochloromethane	ND	ug/L	0.9	08/13/97	AXM	124-48-1	
1,1,2-Trichloroethane	ND	ug/L	0.5	08/13/97	AXM	79-00-5	
trans-1,3-Dichloropropene	ND	ug/L	3.4	08/13/97	AXM	10061-02-6	
Bromoform	ND	ug/L	2	08/13/97	AXM	75-25-2	
Tetrachloroethene	0.54	ug/L	0.5	08/13/97	AXM	127-18-4	
1,1,2,2-Tetrachloroethane	ND	ug/L	0.5	08/13/97	AXM	79-34-5	
Chlorobenzene	ND	ug/L	0.7	08/13/97	AXM	108-90-7	
2-Chloroethyl Vinyl Ether	ND	ug/L	5	08/13/97	AXM	110-75-8	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
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Tel: 707-792-1865
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Pace Analytical

Pace Project Number: 708996
Client Project ID: Economy Parking/Port of Oaklan

Pace Sample No: 701050759 Date Collected: 08/06/97 Matrix: Water
Client Sample ID: MW-1 Date Received: 08/07/97

Parameters	Results	Units	PRL	Analyzed	Analyst	CAS#	Footnotes
1,2-Dichlorobenzene	ND	ug/L	1	08/13/97	AXM	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	1	08/13/97	AXM	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	1	08/13/97	AXM	106-46-7	
cis-1,2-Dichloroethene	18	ug/L	0.5	08/13/97	AXM	156-59-2	
Bromochloromethane (S)	111	%		08/13/97	AXM	74-97-5	
1,4-Dichlorobutane (S)	118	%		08/13/97	AXM	110-56-5	
GAS/BTEX, Water	Method: EPA 8015M/8020M				Prep Method: EPA 8015M/8020M		
Gasoline	75	ug/L	50	08/13/97	AMH		
Benzene	1.9	ug/L	0.5	08/13/97	AMH	71-43-2	
Toluene	ND	ug/L	0.5	08/13/97	AMH	108-88-3	
Ethylbenzene	ND	ug/L	0.5	08/13/97	AMH	100-41-4	
Xylene (Total)	ND	ug/L	1	08/13/97	AMH	1330-20-7	
a,a,a-Trifluorotoluene (S)	88	%		08/13/97	AMH	2164-17-2	
4-Bromofluorobenzene (S)	95	%		08/13/97	AMH	460-00-4	
GC -- Semi-VOA							
TPH by 8015M w/ silica gel	Method: EPA 8015M w/ SG				Prep Method: EPA 3520		
Diesel Fuel	0.34	mg/L	0.05	08/18/97	SBC	11-84-7	1
Motor Oil	ND	mg/L	0.25	08/18/97	SBC		
JP4	ND	mg/L	0.5	08/18/97	SBC		
n-Pentacosane (S)	90	%		08/18/97	SBC	629-99-2	
Date Extracted				08/13/97			

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
1455 McDowell Blvd. North, Suite D
Petaluma, CA 94954
Tel: 707-792-1865
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Pace Analytical

Pace Project Number: 708996
Client Project ID: Economy Parking/Port of Oaklan

Pace Sample No: 701050767 Date Collected: 08/06/97 Matrix: Water
Client Sample ID: MW-2 Date Received: 08/07/97

Parameters	Results	Units	PRL	Analyzed	Analyst	CAS#	Footnotes
Wet Chemistry							
Total Dissolved Solids		Method: EPA 160.1			Prep Method: EPA 160.1		
Total Dissolved Solids	1640	mg/L	5	08/12/97	RVC		
GC -- Volatiles							
Volatile Halogenated Organics		Method: EPA 8010			Prep Method: EPA 8010		
Chloromethane	ND	ug/L	8	08/13/97	AXM	74-87-3	
Bromomethane	ND	ug/L	30	08/13/97	AXM	74-83-9	
Vinyl Chloride	ND	ug/L	18	08/13/97	AXM	75-01-4	
Chloroethane	ND	ug/L	52	08/13/97	AXM	75-00-3	
Methylene Chloride	ND	ug/L	25	08/13/97	AXM	75-09-2	
Trichlorofluoromethane	ND	ug/L	50	08/13/97	AXM	75-69-4	
1,1-Dichloroethene	ND	ug/L	13	08/13/97	AXM	75-35-4	
1,1-Dichloroethane	69	ug/L	7	08/13/97	AXM	75-34-3	
trans-1,2-Dichloroethene	ND	ug/L	10	08/13/97	AXM	156-60-5	
Chloroform	ND	ug/L	5	08/13/97	AXM	67-66-3	
1,2-Dichloroethane	ND	ug/L	5	08/13/97	AXM	107-06-2	
1,1,1-Trichloroethane	ND	ug/L	5	08/13/97	AXM	71-55-6	
Carbon Tetrachloride	ND	ug/L	12	08/13/97	AXM	56-23-5	
Bromodichloromethane	ND	ug/L	10	08/13/97	AXM	75-27-4	
1,2-Dichloropropane	ND	ug/L	5	08/13/97	AXM	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	34	08/13/97	AXM	10061-01-5	
Trichloroethene	ND	ug/L	12	08/13/97	AXM	79-01-6	
Dibromochloromethane	ND	ug/L	9	08/13/97	AXM	124-48-1	
1,1,2-Trichloroethane	ND	ug/L	5	08/13/97	AXM	79-00-5	
trans-1,3-Dichloropropene	ND	ug/L	34	08/13/97	AXM	10061-02-6	
Bromoform	ND	ug/L	20	08/13/97	AXM	75-25-2	
Tetrachloroethene	ND	ug/L	5	08/13/97	AXM	127-18-4	
1,1,2,2-Tetrachloroethane	ND	ug/L	5	08/13/97	AXM	79-34-5	
Chlorobenzene	ND	ug/L	7	08/13/97	AXM	108-90-7	
2-Chloroethyl Vinyl Ether	ND	ug/L	50	08/13/97	AXM	110-75-8	
1,2-Dichlorobenzene	ND	ug/L	10	08/13/97	AXM	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	10	08/13/97	AXM	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	10	08/13/97	AXM	106-46-7	
cis-1,2-Dichloroethene	160	ug/L	5	08/13/97	AXM	156-59-2	
Bromochloromethane (S)	113	%		08/13/97	AXM	74-97-5	
1,4-Dichlorobutane (S)	125	%		08/13/97	AXM	110-56-5	
GAS/BTEX, Water		Method: EPA 8015M/8020M			Prep Method: EPA 8015M/8020M		
Gasoline	9900	ug/L	100	08/13/97	AMH		
Benzene	170	ug/L	1	08/13/97	AMH	71-43-2	
Toluene	270	ug/L	1	08/13/97	AMH	108-88-3	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
1455 McDowell Blvd. North, Suite D
Petaluma, CA 94954
Tel: 707-792-1865
Fax: 707-792-0342

Pace Analytical

Pace Project Number: 708996
Client Project ID: Economy Parking/Port of Oaklan

Pace Sample No: 701050767 Date Collected: 08/06/97 Matrix: Water
Client Sample ID: MW-2 Date Received: 08/07/97

Parameters	Results	Units	PRL	Analyzed	Analyst	CAS#	Footnotes
Ethylbenzene	92	ug/L	1	08/13/97	AMH	100-41-4	
Xylene (Total)	410	ug/L	2	08/13/97	AMH	1330-20-7	
a,a,a-Trifluorotoluene (S)	93	%		08/13/97	AMH	2164-17-2	
4-Bromofluorobenzene (S)	130	%		08/13/97	AMH	460-00-4	2
GC -- Semi-VOA							
TPH by 8015M w/ silica gel	Method: EPA 8015M w/ SG				Prep Method: EPA 3520		
Diesel Fuel	12	mg/L	0.1	08/19/97	PFW	11-84-7	
Motor Oil	2.3	mg/L	0.5	08/19/97	PFW		3
JP4	ND	mg/L	1	08/19/97	PFW		
n-Pentacosane (S)	92	%		08/19/97	PFW	629-99-2	
Date Extracted				08/13/97			

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
1455 McDowell Blvd. North, Suite D
Petaluma, CA 94954
Tel: 707-792-1865
Fax: 707-792-0342

Pace Analytical

Pace Project Number: 708996
Client Project ID: Economy Parking/Port of Oaklan

Pace Sample No: 701050775 Date Collected: 08/06/97 Matrix: Water
Client Sample ID: MW-3 Date Received: 08/07/97

Parameters	Results	Units	PRL	Analyzed	Analyst	CAS#	Footnotes
Wet Chemistry							
Total Dissolved Solids	Method: EPA 160.1				Prep Method: EPA 160.1		
Total Dissolved Solids	15100	mg/L	5	08/12/97	RVC		
GC -- Volatiles							
Volatile Halogenated Organics	Method: EPA 8010				Prep Method: EPA 8010		
Chloromethane	ND	ug/L	0.8	08/13/97	AXM	74-87-3	
Bromomethane	ND	ug/L	3	08/13/97	AXM	74-83-9	
Vinyl Chloride	ND	ug/L	1.8	08/13/97	AXM	75-01-4	
Chloroethane	ND	ug/L	5.2	08/13/97	AXM	75-00-3	
Methylene Chloride	ND	ug/L	2.5	08/13/97	AXM	75-09-2	
Trichlorofluoromethane	ND	ug/L	5	08/13/97	AXM	75-69-4	
1,1-Dichloroethene	ND	ug/L	1.3	08/13/97	AXM	75-35-4	
1,1-Dichloroethane	3.8	ug/L	0.7	08/13/97	AXM	75-34-3	
trans-1,2-Dichloroethene	ND	ug/L	1	08/13/97	AXM	156-60-5	
Chloroform	2.1	ug/L	0.5	08/13/97	AXM	67-66-3	
1,2-Dichloroethane	ND	ug/L	0.5	08/13/97	AXM	107-06-2	
1,1,1-Trichloroethane	ND	ug/L	0.5	08/13/97	AXM	71-55-6	
Carbon Tetrachloride	ND	ug/L	1.2	08/13/97	AXM	56-23-5	
Bromodichloromethane	ND	ug/L	1	08/13/97	AXM	75-27-4	
1,2-Dichloropropane	ND	ug/L	0.5	08/13/97	AXM	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	3.4	08/13/97	AXM	10061-01-5	
Trichloroethene	ND	ug/L	1.2	08/13/97	AXM	79-01-6	
Dibromochloromethane	ND	ug/L	0.9	08/13/97	AXM	124-48-1	
1,1,2-Trichloroethane	ND	ug/L	0.5	08/13/97	AXM	79-00-5	
trans-1,3-Dichloropropene	ND	ug/L	3.4	08/13/97	AXM	10061-02-6	
Bromoform	ND	ug/L	2	08/13/97	AXM	75-25-2	
Tetrachloroethene	0.62	ug/L	0.5	08/13/97	AXM	127-18-4	
1,1,2,2-Tetrachloroethane	ND	ug/L	0.5	08/13/97	AXM	79-34-5	
Chlorobenzene	ND	ug/L	0.7	08/13/97	AXM	108-90-7	
2-Chloroethyl Vinyl Ether	ND	ug/L	5	08/13/97	AXM	110-75-8	
1,2-Dichlorobenzene	ND	ug/L	1	08/13/97	AXM	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	1	08/13/97	AXM	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	1	08/13/97	AXM	106-46-7	
cis-1,2-Dichloroethene	ND	ug/L	0.5	08/13/97	AXM	156-59-2	
Bromochloromethane (S)	110	%		08/13/97	AXM	74-97-5	
1,4-Dichlorobutane (S)	124	%		08/13/97	AXM	110-56-5	
GAS/BTEX, Water	Method: EPA 8015M/8020M				Prep Method: EPA 8015M/8020M		
Gasoline	4200	ug/L	50	08/13/97	AMH		
Benzene	3.6	ug/L	0.5	08/13/97	AMH	71-43-2	
Toluene	16	ug/L	0.5	08/13/97	AMH	108-88-3	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
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Tel: 707-792-1865
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Pace Analytical

Pace Project Number: 708996
Client Project ID: Economy Parking/Port of Oaklan

Pace Sample No: 701050775 Date Collected: 08/06/97 Matrix: Water
Client Sample ID: MW-3 Date Received: 08/07/97

Parameters	Results	Units	PRL	Analyzed	Analyst	CAS#	Footnotes
Ethylbenzene	14	ug/L	0.5	08/13/97	AMH	100-41-4	
Xylene (Total)	90	ug/L	1	08/13/97	AMH	1330-20-7	
a,a,a-Trifluorotoluene (S)	293	%		08/13/97	AMH	2164-17-2	2
4-Bromofluorobenzene (S)	120	%		08/13/97	AMH	460-00-4	
GC -- Semi-VOA							
TPH by 8015M w/ silica gel	Method: EPA 8015M w/ SG				Prep Method: EPA 3520		
Diesel Fuel	1.4	mg/L	0.05	08/18/97	SBC	11-84-7	
Motor Oil	ND	mg/L	0.25	08/18/97	SBC		
JP4	ND	mg/L	0.5	08/18/97	SBC		
n-Pentacosane (S)	75	%		08/18/97	SBC	629-99-2	
Date Extracted				08/13/97			

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
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Fax: 707-792-0342

Pace Analytical

Pace Project Number: 708996
Client Project ID: Economy Parking/Port of Oaklan

Pace Sample No: 701050783 Date Collected: 08/06/97 Matrix: Water
Client Sample ID: MW-1A Date Received: 08/07/97

Parameters	Results	Units	PRL	Analyzed	Analyst	CAS#	Footnotes
GC -- Volatiles							
Volatile Halogenated Organics	Method: EPA 8010				Prep Method: EPA 8010		
Chloromethane	ND	ug/L	0.8	08/13/97	AXM	74-87-3	
Bromomethane	ND	ug/L	3	08/13/97	AXM	74-83-9	
Vinyl Chloride	ND	ug/L	1.8	08/13/97	AXM	75-01-4	
Chloroethane	ND	ug/L	5.2	08/13/97	AXM	75-00-3	
Methylene Chloride	ND	ug/L	2.5	08/13/97	AXM	75-09-2	
Trichlorofluoromethane	ND	ug/L	5	08/13/97	AXM	75-69-4	
1,1-Dichloroethene	ND	ug/L	1.3	08/13/97	AXM	75-35-4	
1,1-Dichloroethane	14	ug/L	0.7	08/13/97	AXM	75-34-3	
trans-1,2-Dichloroethene	ND	ug/L	1	08/13/97	AXM	156-60-5	
Chloroform	ND	ug/L	0.5	08/13/97	AXM	67-66-3	
1,2-Dichloroethane	ND	ug/L	0.5	08/13/97	AXM	107-06-2	
1,1,1-Trichloroethane	ND	ug/L	0.5	08/13/97	AXM	71-55-6	
Carbon Tetrachloride	ND	ug/L	1.2	08/13/97	AXM	56-23-5	
Bromodichloromethane	ND	ug/L	1	08/13/97	AXM	75-27-4	
1,2-Dichloropropane	ND	ug/L	0.5	08/13/97	AXM	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	3.4	08/13/97	AXM	10061-01-5	
Trichloroethene	2.5	ug/L	1.2	08/13/97	AXM	79-01-6	
Dibromochloromethane	ND	ug/L	0.9	08/13/97	AXM	124-48-1	
1,1,2-Trichloroethane	ND	ug/L	0.5	08/13/97	AXM	79-00-5	
trans-1,3-Dichloropropene	ND	ug/L	3.4	08/13/97	AXM	10061-02-6	
Bromoform	ND	ug/L	2	08/13/97	AXM	75-25-2	
Tetrachloroethene	0.52	ug/L	0.5	08/13/97	AXM	127-18-4	
1,1,2,2-Tetrachloroethane	ND	ug/L	0.5	08/13/97	AXM	79-34-5	
Chlorobenzene	ND	ug/L	0.7	08/13/97	AXM	108-90-7	
2-Chloroethyl Vinyl Ether	ND	ug/L	5	08/13/97	AXM	110-75-8	
1,2-Dichlorobenzene	ND	ug/L	1	08/13/97	AXM	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	1	08/13/97	AXM	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	1	08/13/97	AXM	106-46-7	
cis-1,2-Dichloroethene	19	ug/L	0.5	08/13/97	AXM	156-59-2	
Bromochloromethane (S)	115	%		08/13/97	AXM	74-97-5	
1,4-Dichlorobutane (S)	129	%		08/13/97	AXM	110-56-5	
GAS/BTEX, Water	Method: EPA 8015M/8020M				Prep Method: EPA 8015M/8020M		
Gasoline	100	ug/L	50	08/13/97	AMH		
Benzene	2.1	ug/L	0.5	08/13/97	AMH	71-43-2	
Toluene	ND	ug/L	0.5	08/13/97	AMH	108-88-3	
Ethylbenzene	ND	ug/L	0.5	08/13/97	AMH	100-41-4	
Xylene (Total)	ND	ug/L	1	08/13/97	AMH	1330-20-7	
a,a,a-Trifluorotoluene (S)	89	%		08/13/97	AMH	2164-17-2	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
1455 McDowell Blvd. North, Suite D
Petaluma, CA 94954
Tel: 707-792-1865
Fax: 707-792-0342

Pace Analytical

Pace Project Number: 708996
Client Project ID: Economy Parking/Port of Oaklan

Pace Sample No: 701050783 Date Collected: 08/06/97 Matrix: Water
Client Sample ID: MW-1A Date Received: 08/07/97

Parameters	Results	Units	PRL	Analyzed	Analyst	CAS#	Footnotes
4-Bromofluorobenzene (S)	100	%		08/13/97	AMH	460-00-4	

REPORT OF LABORATORY ANALYSIS

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Pace Analytical

Pace Project Number: 708996
Client Project ID: Economy Parking/Port of Oaklan

PARAMETER FOOTNOTES

ND	Not Detected
NC	Not Calculable
PRL	Pace Reporting Limit
(S)	Surrogate
[1]	The result for this hydrocarbon is elevated due to the presence of single analyte peak(s) in quantitation range.
[2]	Surrogate recovery outside of control limits. The data was accepted based on valid recovery of remaining surrogate.
[3]	Hydrocarbons are present in the requested fuel quantitation range but do not resemble pattern of any available fuel standard. Carbon range is C23 - C36.

REPORT OF LABORATORY ANALYSIS

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Pace Analytical

QUALITY CONTROL DATA

Innovative Technical Solutions
1330 Broadway, Suite 1625
Oakland, CA 94612

Pace Project Number: 708996
Client Project ID: Economy Parking/Port of Oaklan

Attn: Mr. Jim Schollard
Phone: (510)286-8888

QC Batch ID: 25568
QC Batch Method: EPA 8010
Analysis Method: EPA 8010
Analysis Description: Volatile Halogenated Organics
Associated Pace Samples: 701050759 701050767 701050775 701050783

METHOD BLANK: 701052243
Associated Pace Samples:
701050759 701050767 701050775 701050783

Parameter	Units	Method Blank Result	PRL	Footnotes
Chloromethane	ug/L	ND	0.8	
Bromomethane	ug/L	ND	3	
Vinyl Chloride	ug/L	ND	1.8	
Chloroethane	ug/L	ND	5.2	
Methylene Chloride	ug/L	ND	2.5	
Trichlorofluoromethane	ug/L	ND	5	
1,1-Dichloroethene	ug/L	ND	1.3	
1,1-Dichloroethane	ug/L	ND	0.7	
trans-1,2-Dichloroethene	ug/L	ND	1	
Chloroform	ug/L	ND	0.5	
1,2-Dichloroethane	ug/L	ND	0.5	
1,1,1-Trichloroethane	ug/L	ND	0.5	
Carbon Tetrachloride	ug/L	ND	1.2	
Bromodichloromethane	ug/L	ND	1	
1,2-Dichloropropane	ug/L	ND	0.5	
cis-1,3-Dichloropropene	ug/L	ND	3.4	
Trichloroethene	ug/L	ND	1.2	
Dibromochloromethane	ug/L	ND	0.9	
1,1,2-Trichloroethane	ug/L	ND	0.5	
trans-1,3-Dichloropropene	ug/L	ND	3.4	
Bromoform	ug/L	ND	2	
Tetrachloroethene	ug/L	ND	0.5	
1,1,2,2-Tetrachloroethane	ug/L	ND	0.5	
Chlorobenzene	ug/L	ND	0.7	
2-Chloroethyl Vinyl Ether	ug/L	ND	5	

REPORT OF LABORATORY ANALYSIS

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Pace Analytical

QUALITY CONTROL DATA

Pace Project Number: 708996
Client Project ID: Economy Parking/Port of Oaklan

METHOD BLANK: 701052243
Associated Pace Samples: 701050759 701050767 701050775 701050783

Parameter	Units	Method Blank Result	PRL	Footnotes
1,2-Dichlorobenzene	ug/L	ND	1	
1,3-Dichlorobenzene	ug/L	ND	1	
1,4-Dichlorobenzene	ug/L	ND	1	
cis-1,2-Dichloroethene	ug/L	ND	0.5	
Bromochloromethane (S)	%	110		
1,4-Dichlorobutane (S)	%	126		

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 701045551 701045569

Parameter	Units	701044810	Spike Conc.	Matrix Spike Result	Spike % Rec	Matrix Sp. Dup. Result	Spike Dup % Rec	RPD	Footnotes
Chloromethane	ug/L	0	20	21.40	107	21.52	108	1	
Bromomethane	ug/L	0	20	19.70	98.5	20.21	101	3	
Vinyl Chloride	ug/L	0	20	21.18	106	21.38	107	1	
Chloroethane	ug/L	0	20	20.75	104	20.84	104	0	
Methylene Chloride	ug/L	0	20	21.39	107	21.88	109	2	
Trichlorofluoromethane	ug/L	0.2994	20	20.22	99.6	20.55	101	2	
1,1-Dichloroethene	ug/L	0.8595	20	21.95	106	22.47	108	2	
1,1-Dichloroethane	ug/L	0	20	21.19	106	21.66	108	2	
trans-1,2-Dichloroethene	ug/L	0	20	21.39	107	21.86	109	2	
Chloroform	ug/L	0	20	20.81	104	21.08	105	1	
1,2-Dichloroethane	ug/L	0	20	21.13	106	21.21	106	0	
1,1,1-Trichloroethane	ug/L	11.34	20	27.12	78.9	27.06	78.6	0	
Carbon Tetrachloride	ug/L	0	20	21.38	107	21.41	107	0	
Bromodichloromethane	ug/L	0	20	21.46	107	21.11	106	2	
1,2-Dichloropropane	ug/L	0	20	21.05	105	21.13	106	0	
cis-1,3-Dichloropropene	ug/L	0	20	20.62	103	20.68	103	0	
Trichloroethene	ug/L	0	20	21.55	108	21.57	108	0	
Dibromochloromethane	ug/L	0	20	20.44	102	20.73	104	1	
1,1,2-Trichloroethane	ug/L	0	20	20.97	105	21.25	106	1	
trans-1,3-Dichloropropene	ug/L	0	20	20.95	105	21.33	107	2	
Bromoform	ug/L	0.1037	20	20.40	102	20.72	103	2	
Tetrachloroethene	ug/L	0	20	20.97	105	21.24	106	1	
1,1,2,2-Tetrachloroethane	ug/L	0	20	20.56	103	20.94	105	2	
Chlorobenzene	ug/L	0	20	20.59	103	21.43	107	4	
1,2-Dichlorobenzene	ug/L	0.3009	20	20.52	101	20.72	102	1	
1,3-Dichlorobenzene	ug/L	0.1272	20	20.85	104	20.84	104	0	

REPORT OF LABORATORY ANALYSIS

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Pace Analytical

QUALITY CONTROL DATA

Pace Project Number: 708996
Client Project ID: Economy Parking/Port of Oaklan

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 701045551 701045569

Parameter	Units	701044810	Spike Conc.	Matrix Spike Result	Spike % Rec	Matrix Sp. Dup. Result	Spike Dup % Rec	RPD	Footnotes
1,4-Dichlorobenzene	ug/L	0.2107	20	20.72	102	20.92	104	1	
cis-1,2-Dichloroethene	ug/L	0	20	21.02	105	21.29	106	1	
Bromochloromethane (S)					102		106		
1,4-Dichlorobutane (S)					104		108		

LABORATORY CONTROL SAMPLE: 701045577

Parameter	Units	Spike Conc.	LCS Result	Spike % Rec	Footnotes
Chloromethane	ug/L	20	21.15	106	
Bromomethane	ug/L	20	20.83	104	
Vinyl Chloride	ug/L	20	20.07	100	
Chloroethane	ug/L	20	19.29	96.5	
Methylene Chloride	ug/L	20	20.82	104	
Trichlorofluoromethane	ug/L	20	19.81	99.1	
1,1-Dichloroethene	ug/L	20	21.00	105	
1,1-Dichloroethane	ug/L	20	20.83	104	
trans-1,2-Dichloroethene	ug/L	20	21.05	105	
Chloroform	ug/L	20	20.48	102	
1,2-Dichloroethane	ug/L	20	20.44	102	
1,1,1-Trichloroethane	ug/L	20	20.72	104	
Carbon Tetrachloride	ug/L	20	20.89	104	
Bromodichloromethane	ug/L	20	20.25	101	
1,2-Dichloropropane	ug/L	20	20.32	102	
cis-1,3-Dichloropropene	ug/L	20	20.12	101	
Trichloroethene	ug/L	20	21.13	106	
Dibromochloromethane	ug/L	20	19.84	99.2	
1,1,2-Trichloroethane	ug/L	20	20.09	100	
trans-1,3-Dichloropropene	ug/L	20	20.40	102	
Bromoform	ug/L	20	19.92	99.6	
Tetrachloroethene	ug/L	20	20.80	104	
1,1,2,2-Tetrachloroethane	ug/L	20	18.87	94.4	
Chlorobenzene	ug/L	20	20.97	105	
1,2-Dichlorobenzene	ug/L	20	20.98	105	
1,3-Dichlorobenzene	ug/L	20	21.26	106	
1,4-Dichlorobenzene	ug/L	20	21.48	107	
cis-1,2-Dichloroethene	ug/L	20	20.72	104	
Bromochloromethane (S)				101	
1,4-Dichlorobutane (S)				101	

REPORT OF LABORATORY ANALYSIS

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Pace Analytical

QUALITY CONTROL DATA

Innovative Technical Solutions
1330 Broadway, Suite 1625
Oakland, CA 94612

Pace Project Number: 708996
Client Project ID: Economy Parking/Port of Oaklan

Attn: Mr. Jim Schollard
Phone: (510)286-8888

QC Batch ID: 25757
QC Batch Method: EPA 160.1
Analysis Method: EPA 160.1
Analysis Description: Total Dissolved Solids
Associated Pace Samples: 701050759 701050767 701050775

METHOD BLANK: 701054587
Associated Pace Samples:
701050759 701050767 701050775

Parameter	Units	Method Blank Result	PRL	Footnotes
Total Dissolved Solids	mg/L	ND	5	

SAMPLE DUPLICATE: 701054595

Parameter	Units	701049710	Dup. Result	RPD	Footnotes
Total Dissolved Solids	mg/L	388.0	405.0	4	

REPORT OF LABORATORY ANALYSIS

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Pace Analytical

QUALITY CONTROL DATA

Innovative Technical Solutions
1330 Broadway, Suite 1625
Oakland, CA 94612

Pace Project Number: 708996
Client Project ID: Economy Parking/Port of Oaklan

Attn: Mr. Jim Schollard
Phone: (510)286-8888

QC Batch ID: 25775
QC Batch Method: EPA 3520
Analysis Method: EPA 8015M w/ SG
Analysis Description: TPH by 8015M w/ silica gel
Associated Pace Samples: 701050759 701050767 701050775

METHOD BLANK: 701055832
Associated Pace Samples:
701050759 701050767 701050775

Parameter	Units	Method Blank Result	PRL	Footnotes
Diesel Fuel	mg/L	ND	0.05	
Motor Oil	mg/L	ND	0.25	
JP4	mg/L	ND	0.5	
n-Pentacosane (S)	%	98		

LABORATORY CONTROL SAMPLE & LCSD: 701055840 701055857

Parameter	Units	Spike Conc.	LCS Result	Spike % Rec	LCSD Result	Spike Dup % Rec	RPD	Footnotes
Diesel Fuel	mg/L	1.0	0.4897	49.0	0.4224	42.2	15	
n-Pentacosane (S)				108		85		

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
1455 McDowell Blvd. North, Suite D
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Tel: 707-792-1865
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Pace Analytical

QUALITY CONTROL DATA

Innovative Technical Solutions
1330 Broadway, Suite 1625
Oakland, CA 94612

Pace Project Number: 708996
Client Project ID: Economy Parking/Port of Oaklan

Attn: Mr. Jim Schollard
Phone: (510)286-8888

QC Batch ID: 25794
QC Batch Method: EPA 8015M/8020M
Analysis Method: EPA 8015M/8020M
Analysis Description: GAS/BTEX, Water
Associated Pace Samples: 701050759 701050767 701050775 701050783

METHOD BLANK: 701056277
Associated Pace Samples:
701050759 701050767 701050775 701050783

Parameter	Units	Method Blank Result	PRL	Footnotes
Gasoline	ug/L	ND	50	
Benzene	ug/L	ND	0.5	
Toluene	ug/L	ND	0.5	
Ethylbenzene	ug/L	ND	0.5	
Xylene (Total)	ug/L	ND	1	
a,a,a-Trifluorotoluene (S)	%	88		
4-Bromofluorobenzene (S)	%	87		

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 701056285 701056293

Parameter	Units	701050759	Spike Conc.	Matrix Spike Result	Spike % Rec	Matrix Sp. Dup. Result	Spike Dup % Rec	RPD	Footnotes
Gasoline	ug/L	75.29	1000	1097	102	1203	113	10	

LABORATORY CONTROL SAMPLE: 701056301

Parameter	Units	Spike Conc.	LCS Result	Spike % Rec	Footnotes
Gasoline	ug/L	1000	1128	113	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
1455 McDowell Blvd. North, Suite D
Petaluma, CA 94954
Tel: 707-792-1865
Fax: 707-792-0342

Pace Analytical

Pace Project Number: 708996
Client Project ID: Economy Parking/Port of Oaklan

QUALITY CONTROL DATA PARAMETER FOOTNOTES

Consistent with EPA guidelines unrounded concentrations are displayed and have been used to calculate % Rec and RPD values.

ND	Not Detected
NC	Not Calculable
PRL	Pace Reporting Limit
RPD	Relative Percent Difference
(S)	Surrogate

REPORT OF LABORATORY ANALYSIS

INNOVATIVE TECHNICAL SOLUTIONS, Inc.

ITSI
1330 Broadway, Suite 1625
Oakland, California 94612
(510) 286-8888 (Tel), (510) 286-8889 (Fax)

708996

PROJECT NAME: P/O Economy Parking W.O.# 028691
PROJECT NUMBER: 95-113.28
SITE LOCATION: MOTA, Oakland CA

CHAIN OF CUSTODY

DATE: 8-6-97
PAGE: 1 of 1

SAMPLE I.D.	SAMPLE DEPTH	DATE	TIME	NUMBER OF CONTAINERS	TYPE OF CONTAINERS	SAMPLE MATRIX	ANALYSIS: TPH as Gas/BTEX - 8015/8020 602	TPH as Diesel - 8015	TPH as Diesel - 8015 (w/ Silica Gel Cleanup)	TEPH - 8015	TEPH-8015 (w/ Silica Gel Cleanup)	TRPH - 418.1	Oil and Grease - 5520	Purgeable Halocarbons - 601/8010 (VOC)	VOCs - 624/ 8240	SVOCs - 625/8270	LUFT Metals (Cd, Cr, Ni, Pb, Zn)	CAM 17 Metals	TDS (160.1)	
MW-1	↓	8-6-97	13:15	8	2-1Ls 5-VOAs 1-250ml each well	Water	X	X	X					X					X	
MW-2		↓	14:40	8		↓	X	X	X					X					X	
MW-3			13:50	8			X	X	X					X					X	
MW-1a			13:20	3	3-VOAs	Water	X	↑						X						
								Do not run, VOID												
TOTAL NUMBER OF CONTAINERS					TOTAL TESTS		4		3					4					3	

Pace Analytical
Petaluma, CA
WO # 028691

SPECIAL INSTRUCTIONS/COMMENTS
7010507597
7010507677
7010507757
7010507837

SAMPLED BY: William F Scott
SIGNATURE: William F Scott

SPECIAL INSTRUCTIONS/COMMENTS: Standard TAT; Please provide chromatograms

RELINQUISHED BY: William F Scott William F Scott
Printed Name Signature
ITSI 8-7-97 13:00
Company Date and Time

RECEIVED BY: Joey Martin Joey Martin
Printed Name Signature
Pasi 8/7/97 13:00
Company Date and Time

RELINQUISHED BY: Joey Martin Joey Martin
Printed Name Signature
Pasi 8/7/97 ~~13:00~~ 1430
Company Date and Time

RECEIVED BY: GAIL HARRIMAN Gail Harriman
Printed Name Signature
PASI 8/7/97 14:30
Company Date and Time

RELINQUISHED BY: _____
Printed Name Signature
_____
Company Date and Time

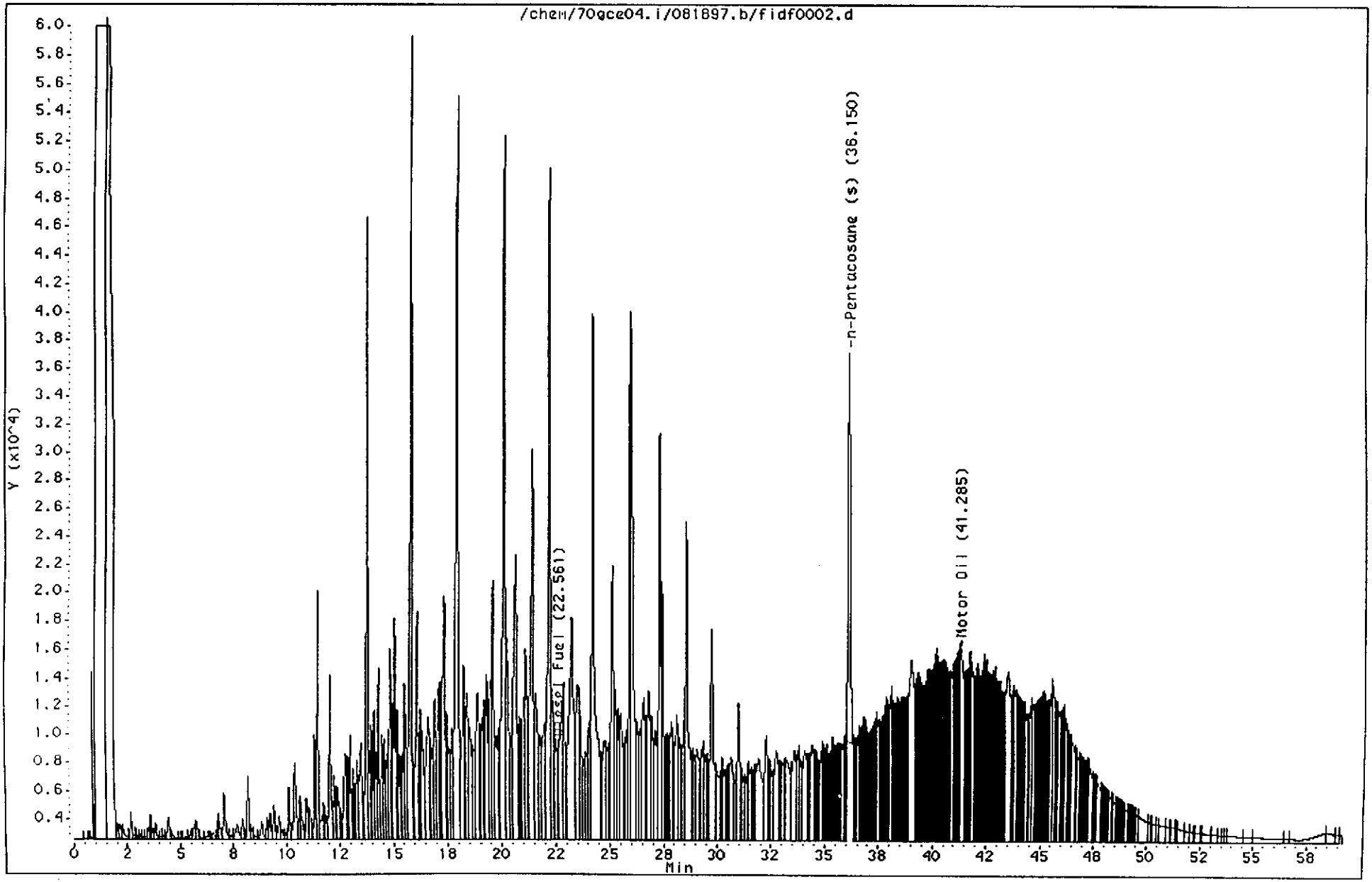
RECEIVED BY: _____
Printed Name Signature
_____
Company Date and Time

SEND RESULTS TO: _____

Data File: /chem/70gce04.i/081897.b/fidf0002.d
Date : 18-AUG-1997 10:08
Client ID: SSTD2500
Lab Sample ID: SSTD2500D

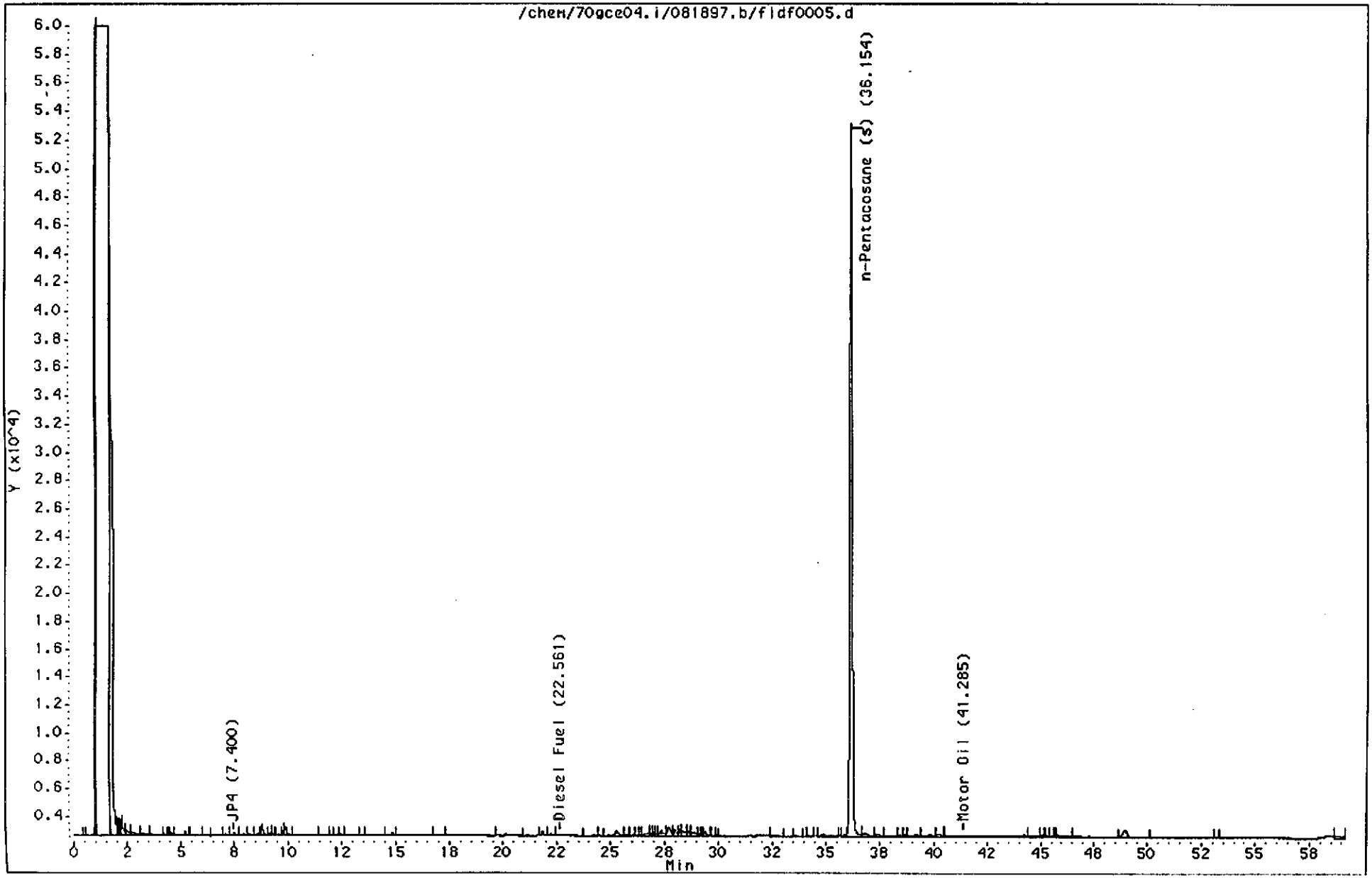
Column phase: RESTEK XTI-5

Instrument: 70gce04.i
Misc Info: SSTD2500D,,,,,DS-256
Operator: WSN
Column diameter: 0.53



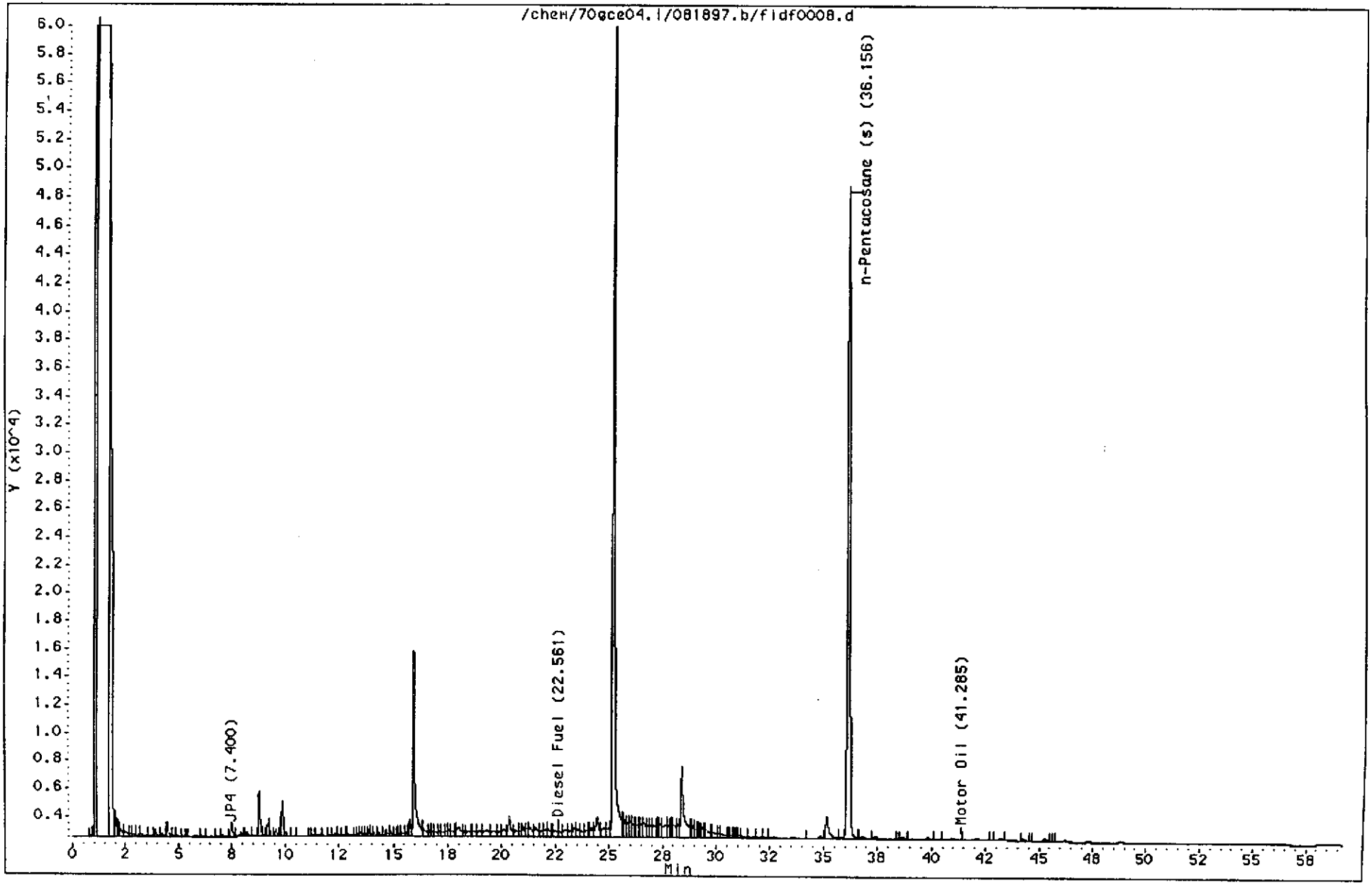
Data File: /chem/70gce04.i/081897.b/fidf0005.d
Date : 18-AUG-1997 17:10
Client ID: SBLKF1
Lab Sample ID: 701055832
Volume Injected (uL): 1.0
Column phase: RESTEK XTI-5

Instrument: 70gce04.i
Misc Info: 701055832,1,25775,,,
Operator: SBC
Column diameter: 0.53



Data File: /chem/70gce04.i/081897.b/fidf0008.d
Date : 18-AUG-1997 20:30
Client ID: MW-1
Lab Sample ID: 701050759
Volume Injected (uL): 1.0
Column phase: RESTEK XTI-5

Instrument: 70gce04.i
Misc Info: 701050759,1,25775,,,
Operator: SBC
Column diameter: 0.53



Data File: /chem/70gce04.i/081997.b/fidf0005.d

Date : 19-AUG-1997 17:26

Client ID: MW-2

Lab Sample ID: 701050767

Volume Injected (uL): 1.0

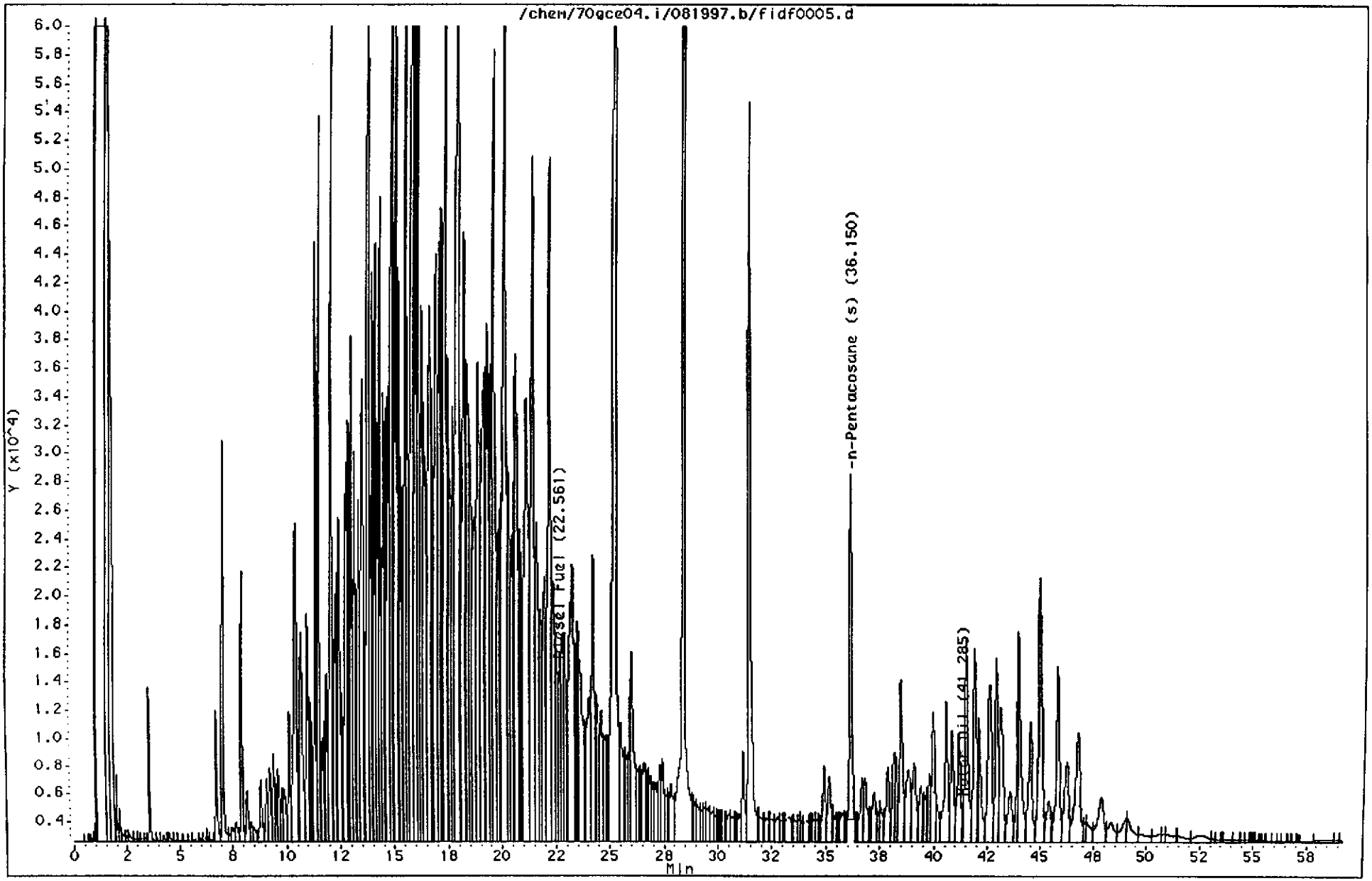
Column phase: RESTEK XTI-5

Instrument: 70gce04.i

Misc Info: 701050767,2,25775,,,diesel:no:jp4

Operator: PFW

Column diameter: 0.53



Data File: /chem/70gce04.i/081897.b/fidf0010.d
Date : 18-AUG-1997 22:44
Client ID: MW-3
Lab Sample ID: 701050775
Volume Injected (uL): 1.0
Column phase: RESTEK XTI-5

Instrument: 70gce04.i
Misc Info: 701050775,1,25775,,,
Operator: SBC
Column diameter: 0.53