INNOVATIVE TECHNICAL SOLUTIONS, Inc.

ITSI

March 17, 1998

Project No. 95-113.49

Mr. John Prall
Associate Environmental Scientist
Port of Oakland
530 Water Street
Oakland, California 94607

Groundwater Monitoring, Sampling and Product Removal System O&M Report
2277 Seventh Street
Oakland, California

Dear Mr. Prall:

This Groundwater Monitoring, Sampling and Product Removal System O&M Report (Report) has been prepared by Innovative Technical Solutions, Inc. (ITSI) on behalf of the Port of Oakland for groundwater monitoring and sampling performed on December 31, 1997, and operations and maintenance (O&M) of the product removal system on December 30, 1997, January 29, 1998, and March 2, 1998 at the 2277 Seventh Street site in Oakland, California. A site location map is shown on Figure 1.

The scope of work included monitoring and sampling eight groundwater monitoring wells, MW-1 through MW-8. The monitoring wells are located in the vicinity of former underground storage tanks previously removed from the site in September 1993, consisting of two 10,000-gallon tanks (CF-17 and CF-18), one 500-gallon oil tank (CF-19), and one 300-gallon waste oil tank (CF-20).

MONITORING AND SAMPLING OF MONITORING WELLS

The groundwater monitoring and sampling was performed on December 31, 1997. Monitoring wells MW-1, MW-3, and MW-6 contain product skimmers, and were thus not included in the groundwater monitoring and sampling program. The remaining monitoring wells were initially gauged for depth to water and checked for the presence of separate phase hydrocarbons.

1330 Broadway, Suite 1625, Oakland, CA 94612 (510) 286-8888 (510) 286-8889 fax

Separate phase hydrocarbons were observed in monitoring well MW-8, as noted in Table 1. The depth to product and depth to water measurements were recorded on Monitoring Well Purge and Sample Forms. Copies of the Forms are provided in Attachment A.

After the depth to water measurements were recorded, the monitoring wells not containing separate phase hydrocarbons were purged using a peristaltic pump. Approximately three casing volumes of water were removed, until pH, conductivity, and temperature readings stabilized. Field parameters were recorded on the Monitoring Well Purge and Sample Forms.

Groundwater samples were collected from the monitoring wells using the peristaltic pump and transferred into laboratory provided containers. The sample containers were properly labeled with the sample number, date and time of collection, and samplers' initials, and were placed on ice in an insulated cooler. Purge water was placed in a properly labeled drum and stored inside the product recovery compound.

MONITORING WELL GROUNDWATER LEVELS

Depth to water data is summarized in Table 1. The groundwater elevations were calculated using the measured depth to water and survey elevation of top of casing (relative to the Port of Oakland datum) provided in Table 1. Local groundwater flow direction is shown in Figure 2, and is to the north-northeast.

LABORATORY ANALYSIS OF GROUNDWATER SAMPLES

The samples were sent under chain-of-custody procedures to Curtis and Tompkins, Ltd. in Berkeley, California. The samples were analyzed according to the following schedule:

Monitoring Well I.D.	Analyses			
	TPHg[1]	BTEX[2]	TPHd[3]	TPHmo[4]
MW-2	x	x	x	x
MW-4	x	x	x	x
MW-5	x	x	x	x
MW-7	x	x	x	x
MW-8	separate-phase hydrocarbons present			

[1] TPH as gasoline by Modified EPA Method 8015.
[2] Benzene, toluene, ethyibenzene, and xylenes (BTEX) by EPA Method 8020A.
[3] TPH as diesel by Modified EPA Method 8015 with silica gel cleanup procedure.
[4] TPH as motor oil by EPA Method 8015 with silica gel cleanup procedure.

The laboratory results for the groundwater samples are summarized in Table 2, and are shown in Figure 2. Copies of the laboratory results, chromatograms and chain-of-custody are provided in Attachment B.

FINDINGS

Results of the December 31, 1997 groundwater monitoring and sampling are summarized below:

- Separate-phase hydrocarbons were observed in monitoring wells MW-1, MW-3, MW-6 and MW-8.
- TPHg was reported at a concentration of 73 µg/l in MW-4, and was reportedly non-detect in MW-2, MW-5 and MW-7.
- Benzene was reported at concentrations of 1.4 µg/l and 110 µg/l in MW-2 and MW-4, respectively, and was reportedly non-detect in MW-5 and MW-7.
- Toluene was reported at a concentration of 1.0 µg/l in MW-4, and was reportedly non-detect in MW-2, MW-5 and MW-7.
- Ethylbenzene and xylenes were reportedly non-detect in the samples collected.
- TPHd was reported at a concentration of 53 µg/l in MW-7, and was reportedly non-detect in MW-2, MW-4 and MW-5.
- TPHmo was reportedly non-detect in the samples collected.

PRODUCT REMOVAL SYSTEM O&M

The product removal system was inspected monthly. The inspections consist of the removal of product accumulated in passive skimmers in MW-1 and MW-6, and an inspection of the operational status of the active skimmer system installed in MW-3.

The volume of product recovered from the two passive skimmers and one active skimmer system is shown in Table 1. The status of the active skimmer system during the monthly inspections is summarized below:

Date	System Status	Comments
12/30/97	Up	Verified system status. No access to control box.
1/29/98	Down	Air supply line was partially closed. Air line was reset to full open position, and system was restarted. No access to control box.
3/2/98	Down	Air compressor was down (possibly due to excess water in control panel). Air compressor was restarted. Obtained access to control box. Tank full indicator had been triggered, and was reset. System restarted. Tested shut-off switches and checked filters. Pulled active skimmer, untangled discharge line, increasing purge volume from approximately 10 ml/cycle to 30-40 ml/cycle.

The passive skimmers appear to be passing water in addition to oil, allowing water to enter into their recovery chambers. The intake screens should be serviced or replaced to prevent their passing water. The active skimmer system should be serviced to increase the pumping rate and restore product recovery rate to original design capacity.

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

Sincerely,

for

Jim Schollard
Environmental Scientist

Jeffrey D. Hess, R.G.
Project Director

Attachments

Table 1

Groundwater Elevations and Product Removal Data
2277 7th Street
Oakland, California

Well ID	Elevation of Top of Casing[1] (feet)	Date of Monitoring	Depth to Free Product (feet)	Depth to Water (feet)	Product Thickness (feet)	Groundwater Elevation (feet)	Estimated Product Removed (gallons)	Method	Note
MW-1	14.14	12/31/97	-	-	-	-	0.2	passive skimmer	
		1/29/98	-	-	-	-	0.2	passive skimmer	
		3/2/98	-	-	-	-	0.018	passive skimmer	
MW-2	14.36	12/31/97	-	8.73	-	5.63	-	-	
MW-3	14.22	12/31/97	-	-	-	-	30	active skimmer	
		1/29/98	-	-	-	-	10	active skimmer	
		3/2/98	-	-	-	-	0	active skimmer	
MW-4	13.15	12/31/97	-	7.09	-	6.06	-	-	
MW-5	13.49	12/31/97	-	6.38	-	7.11	-	-	
MW-6	14.00	13/31/97	-	-	-	-	0.0014	passive skimmer	
		1/29/98	-	-	-	-	0.0014	passive skimmer	
		3/2/98	-	-	-	-	0.0014	passive skimmer	
MW-7	14.35	12/31/97	-	8.88	-	5.47	-	-	
MW-8	12.94	12/31/97	8.49	8.82	0.33	4.38	-	-	2

Notes:

1 Elevation data relative to Port of Oakland datum; well surveys performed on September 12. 1996 and February 4, 1998 by PLS Surveys.

2 Groundwater elevation calculated assuming a specific gravity of 0.8 for free product.

Table 2

Summary of Laboratory Results
2277 7th Street
Oakland, California

Monitoring Well ID	Date	TPHg (µg/l)	Benzene (µg/l)	Toluene (µg/l)	Ethyl-benzene (µg/l)	Xylenes (µg/l)	TPHd (µg/l)	TPHmo (µg/l)	Note
MW-2	5/27/94	87	<0.5	<0.5	<0.5	<0.5	470	NA	1
	3/29/95	<50	<0.4	<0.3	<0.3	<0.4	110	1,400	1
	9/6/95	<50	<0.4	<0.3	<0.3	<0.4	NA	NA	1
	1/8/96	<50	<0.4	<0.3	<0.3	<0.4	<50	1,200	1
	4/4/96	<50	<0.5	<0.5	<0.5	<1.0	160	320	1
	7/10/96	<50	<0.4	<0.3	<0.3	<0.4	120	1,400	1
	12/3/96	<50	<0.5	<0.5	<0.5	<1.0	230[2,3]	<250	1
	3/28/97	<50	<0.5	<0.5	<0.5	<1.0	71[5]	<250	1
	6/13/97	51	<0.5	<0.5	<0.5	<1.0	<50	<250	1
	9/18/97	82	0.56	<0.5	<0.5	<1.0	<50	<250	1
	12/31/97	<50	1.4	<0.5	<0.5	<1.0	<47	<280	
MW-4	9/11/95	150	23	<0.3	<0.3	<0.4	<200	500	1
	1/8/96	790	170	1.2	0.6	0.6	90	400	1
	4/4/96	1,100	320	1.6	1.1	1.2	180	300	1
	7/10/96	1,200	470	1.5	0.8	0.8	120	300	1
	12/3/96	990	350	3.3	1.3	1.3	220[2,3]	<250	1
	3/28/97	440[3]	190	1.2	0.64	<1.0	<50	<250	1
	6/13/97	1,300	500	5.5	3.4	2.8	92[6]	<250	1
	9/18/97	1,300	550	4.9	2.1	2.0	150	<250	1
	12/31/97	73[2,3,4]	110[2]	1.0[2]	<0.5	<1.0	<47	<280	
MW-5	9/11/95	90	3.3	<0.3	<0.3	<0.4	<300	2,500	1
	4/4/96	<50	<0.5	<0.5	<0.5	<1.0	180	520	1
	7/10/96	<50	<0.4	<0.3	<0.3	<0.4	120	1,500	1
	12/3/96	<50	<0.5	<0.5	<0.5	<1.0	200[2,3]	<250	1

Table 2 (Continued)

Summary of Laboratory Results
2277 7th Street
Oakland, California

Monitoring Well ID	Date	TPHg	Benzene	Toluene	Ethyl-benzene	Xylenes	TPHd	TPHmo	Note
MW-5	3/28/97	<50	<0.5	<0.5	<0.5	<1.0	<50	<250	1
(continued)	6/13/97	<50	<0.5	<0.5	<0.5	<1.0	<50	<250	1
	9/18/97	<50	<0.5	<0.5	<0.5	<1.0	<50	<250	1
	12/31/97	<50	<0.5	<0.5	<0.5	<1.0	<47	<280	
MW-6	1/8/96	480	15	1.9	9.7	5.2	11,000	6,100	1
	4/4/96	440	16	0.97	3.9	3	6,100	1,200	1
	7/10/96	550	16	0.9	3	2.7	8,300	5,500	1
	12/3/96	passive skimmer installed, no further samples collected							
MW-7	9/6/95	<50	<0.4	<0.3	<0.3	<0.4	<300	800	1
	1/8/96	<50	<0.4	<0.3	<0.3	<0.4	410	110	1
	4/4/96	<50	<0.5	<0.5	<0.5	<1.0	530	340	1
	7/10/96	80	<0.4	<0.3	<0.3	<0.4	840	1,700	1
	12/3/96	<50	<0.5	<0.5	<0.5	<1.0	280[2,3]	<250	1
	3/28/97	65[7]	<0.5	<0.5	<0.5	<1.0	94[3]	<250	1
	6/13/97	<50	<0.5	<0.5	<0.5	<1.0	100	<250	1
	9/18/97	<50	<0.5	<0.5	<0.5	<1.0	240	<250	1
	12/31/97	<50	<0.5	<0.5	<0.5	<1.0	53[3,4]	<280	

Notes:

1 Data from Table 2, Groundwater Analytical Results, Quarterly Groundwater Monitoring Report: Third Quarter 1997, Building C-401, 2277 7th Street, Oakland, CA, by Uribe and Associates, October 24, 1997.

2 Analyte found in the associated blank as well as in the sample.

3 Hydrocarbons present do not match profile of laboratory standard.

4 Low boiling point/lighter hydrocarbons are present in the sample.

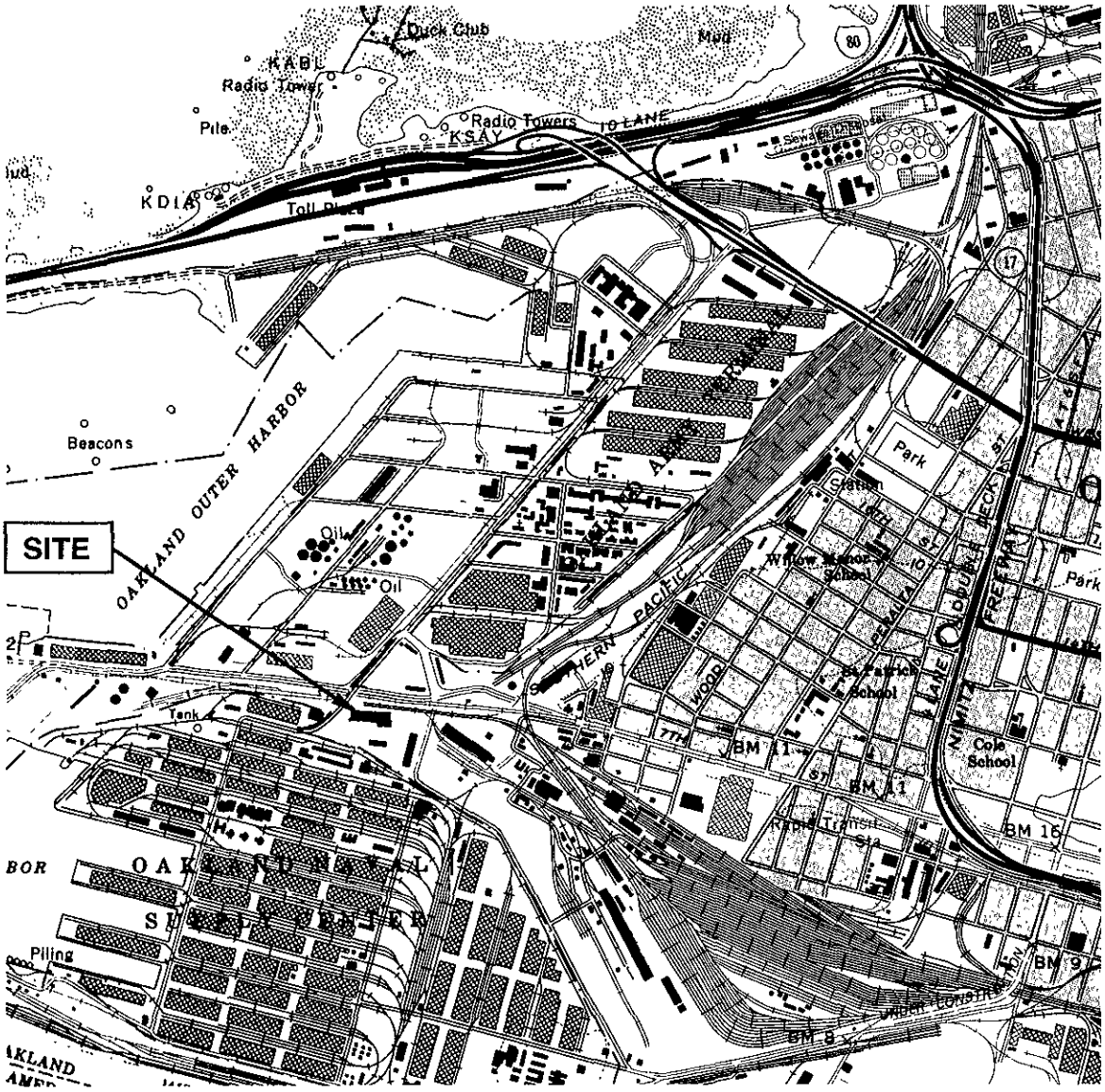
5 Chromatographic pattern matches known laboratory contaminant.

6 Hydrocarbons are present in the requested fuel quantification range, but do not resemble pattern of available fuel standard.

7 High boiling point hydrocarbons are present in sample.

NA Not Analyzed.

95-113 49/F.1-SitLoc



0 2,000 Feet 4,000 Feet

Approximate Scale

Source: Oakland West 7.5-minute U.S.G.S. Quadrangle, dated 1959, and photorevised in 1980.

FIGURE 1

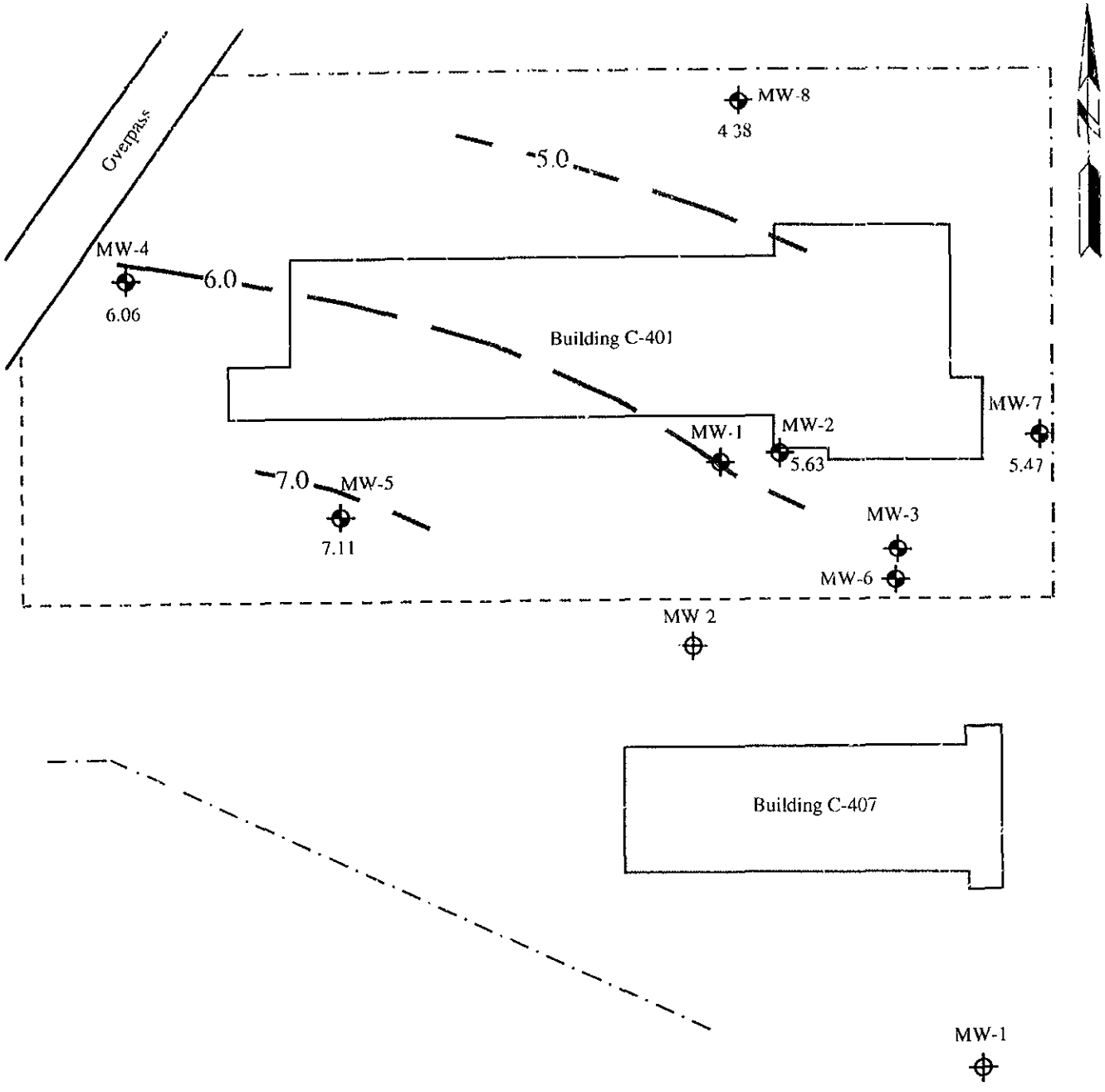
SITE LOCATION

2277 7th Street
Oakland, California

PORT OF OAKLAND

ITSI

INNOVATIVE TECHNICAL SOLUTIONS, INC.



Legend

- Approximate Location of Monitoring Well
- Approximate Location of Monitoring Well (by others)
- 7.11 Calculated Groundwater Elevation (in feet) on 12/31/97

0 100 Feet 200 Feet

Approximate Scale

— · — · — Fence Line

— — — Lease Line

Source: Historical aerial photograph Port of Oakland

FIGURE 2

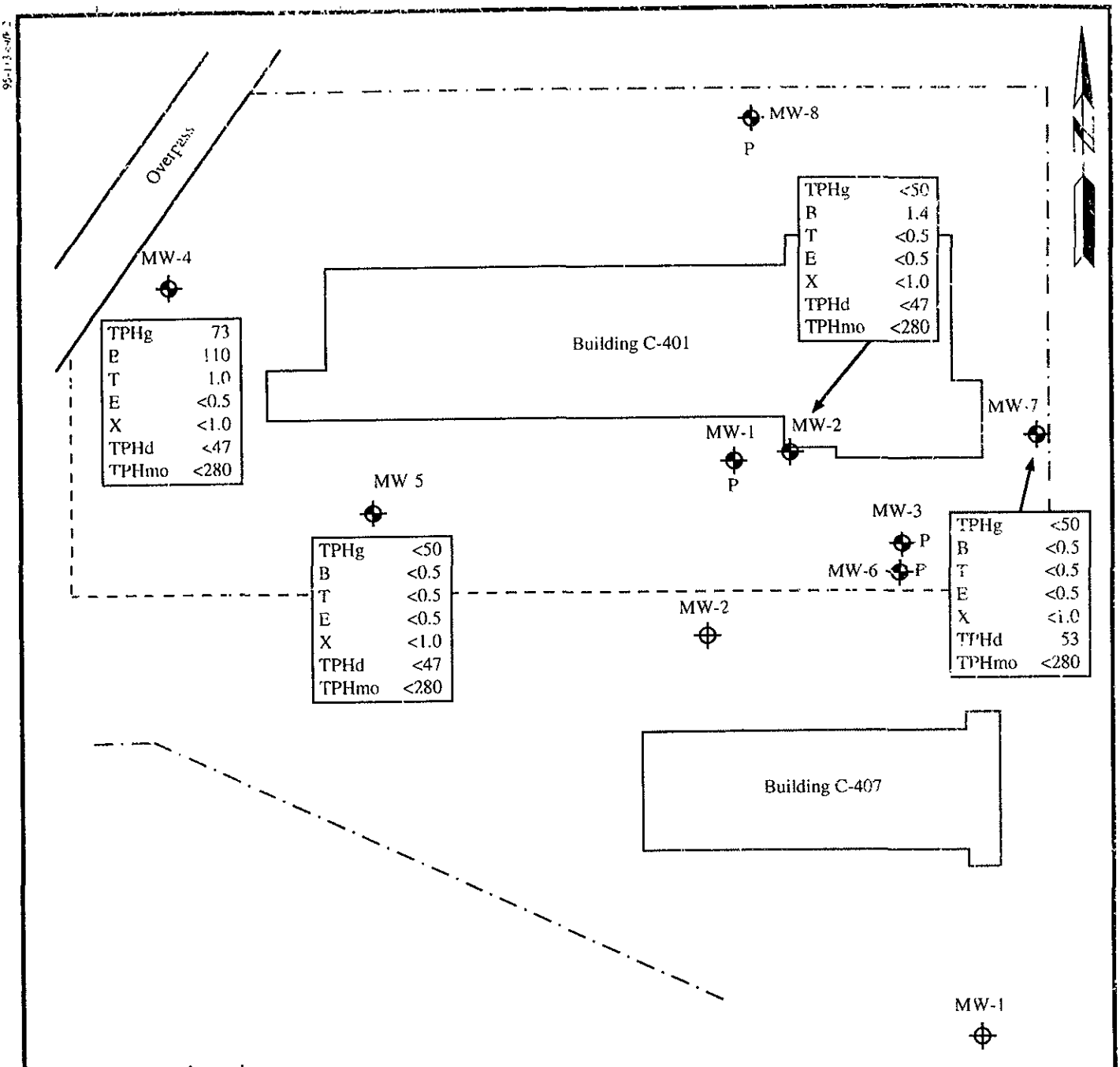
GROUNDWATER ELEVATIONS AND FLOW DIRECTION ON DECEMBER 31, 1997

2277 7th Street
Oakland, California

PORT OF OAKLAND

ITSI

INNOVATIVE TECHNICAL SOLUTIONS, INC.



Legend

- Approximate Location of Monitoring Well
- Approximate Location of Monitoring Well (by others)
- TPHg — TPH as gasoline (in µg/L)
- B — Benzene (in µg/L)
- T — Toluene (in µg/L)
- E — Ethylbenzene (in µg/L)
- X — Total Xylenes (in µg/L)
- TPHd — TPH as diesel (in µg/L)
- TPHmo — TPH as motor oil (in µg/L)
- P — Free Product in Monitorin gWell
- Fence Line
- Lease Line

0 100 Feet 200 Feet

Approximate Scale

Source: Historical aerial photograph, Port of Oakland

FIGURE 3

CONCENTRATIONS OF PETROLEUM HYDROCARBONS IN GROUNDWATER ON DECEMBER 31, 1997

2277 7th Street
Oakland, California

PORT OF OAKLAND

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INNOVATIVE TECHNICAL SOLUTIONS, INC.

ATTACHMENT A

COPIES OF MONITORING WELL PURGE AND SAMPLE FORMS

INNOVATIVE TECHNICAL SOLUTIONS, Inc.

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

DAILY ACTIVITY REPORT

PROJECT NAME: P/O 2277 7th ST
PROJECT NUMBER: 95-113.49
SITE LOCATION: 2277 7th ST, Port of Oakland
DATE: 12-31-97
PAGE 1 OF 1

TIME	DESCRIPTION OF FIELD ACTIVITIES AND EVENTS
7 15	BILL SCOTT ARRIVES ON SITE AFTER PICKING UP TWO NEW DRUMS FROM
	ITSI STORAGE & OBTAINED GAT CLEARANCE. LOOK FOR WELLS
	FIND ALL EXCEPT MW-5 CARS PROBABLY PARKED OVER WELL HEAD
	WILL START QM AT MW-2

	WELL	DTP	DTW	DTB	COMMENTS
✓	MW-2	NONE	8.73	15.27	SOFT BOTTOM,
✓	MW-7	NONE	8.88	18.15	SOFT BOTTOM, NO LOCK (INSTALLED LOCK)
✓	MW-5	NONE	6.32	17.68	SOFT BOTTOM, NO LOCK (INSTALLED LOCK) H2O IN BOX
✓	MW-4	NONE	7.09	18.80	SOFT BOTTOM, NO LOCK, (INSTALLED LOCK) H2O IN BOX
✓	MW-8	8.49	8.82	—	Not Sampled (0.33' product present)

8:20	STARTED QM AT MW-2 / 9.30 : QM @ MW-7
9 55	FOUND MW-5, NOT ACCURATELY SHOWN ON MAP.
10:00	STARTED SAMPLING MW-5
10:50	FINISHED SAMPLING MW-5, MEASURED PRODUCT LEVEL MW-8
11 45	OFF SITE TO 801 Maritime
13 30	BACK ON SITE TO SAMPLE MW-4
14:17	FINISHED SAMPLING MW-4,
	PUT DECON + PURGE WATER INTO
	DRUM ON SITE PLACED INSIDE
	REMEDIATION Compound SITE, LABLED AS
	PURGE + RINSE WATER MW-2, MW-4,
	MW-5, MW-7 + MW-1 (of 801 Maritime)
15:10	OFF SITE TO DELIVER SAMPLES TO LAB

REFERENCE SKETCH

SEE SITE MAP

WEATHER

AM Fog, PM Sun, Cool

EQUIPMENT/MATERIALS

See D/C Form

PREPARED BY: William K Scott
DATE: 12-31-97
CHECKED BY*: Jim Scholland
DATE: 2/5/98

DISTRIBUTION:

PREPARERS SIGNATURE:

REVIEWERS SIGNATURE: Jim Scholland

* Not appropriate for a field activity report when only one responsible person is in the field.

MONITORING WELL
PURGE AND SAMPLE FORM

PROJECT NAME: Port of Oakland, 2277 7th ST PROJECT NO.: 95-113.49

WELL NO.: MW-2 TESTED BY: WKS DATE: 12-31-97

Measuring Point Description: TOP OF CASING

Total Well Depth (ft.): 15.27

Water Level Measurement Method: DUAL INTERFACE

Purge Method: PERISTALTIC PUMP

Time Start Purge: 8:32

Time End Purge: 8:58

Comments: soft @ T.D

Static Water Level (ft): 8.73

Sample Method: Peristaltic pump

Time Sampled: 9:00

Sample Depth (ft.): >9.0

Field Filtering: NONE

Field Preservation: HCl in VOAs, Blue Ice

Well Volume Calculation (fill in before purging)	Total Depth (ft)	-	Depth to Water (ft)	=	Water Column (ft)	x	Multiplier for Casing Diameter (in) 2	4	6	=	Casing Volume (gal)
	15.27	-	8.73	=	6.54	x	(0.16)	0.64	1.44	=	1.0 3.0 (3 vols)

Time	8:[illegible]	8:45	8:53	8:58			
Volume Purged (gals)	0.[illegible]	0.75	1.25	0.5			
Cumulative Volume Purged (gals)	[illegible]	1.25	2.50	3.0			
Cumulative Number of Casing Volumes	0.5	1.25	2.5	3.0			
Purge Rate (gpm)	0.1	0.1	0.16	0.1			
Temperature (F°) or (C°)	18.8	19.6	19.7	19.6			
pH	7.18	7.16	7.12	7.12			
Specific Conductivity (µmhos/cm)	2,000	2,000	2,000	2,000			
Dissolved Oxygen (mg/L)	—	—	—	—			
Turbidity/Color (NTU)	CLEAR	CLEAR	CLEAR	CLEAR			
Odor	H_2S	→	→	→			
Dewatered?	No	→	→	→			

CHECKED BY: [signature] DATE: 2/5/98

ITSI

MONITORING WELL
PURGE AND SAMPLE FORM

PROJECT NAME: Port of Oakland, 2277 7th St. PROJECT NO.: 95-113.49

WELL NO.: MW-4 TESTED BY: WKS DATE: 12-31-97

Measuring Point Description: Mark on TOC

Total Well Depth (ft.): 19.80

Water Level Measurement Method: DUAL INTERFACE

Purge Method: PERISTALTIC PUMP

Time Start Purge: 13:45

Time End Purge: 14 17

Static Water Level (ft.): 7.09

Sample Method: PERISTALTIC PUMP

Time Sampled: 14:20 / 14'25 QC-1

Sample Depth (ft.): > 7.09

Field Filtering: NONE

Field Preservation: HCl in VOAs [illegible]

Comments: Soil @ T.D ; no lock present (installed 0895 lock) ; H2O in box (4")
QC-1 (field duplicate) sample also collected from well

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		1.9
	19.80	-	7.09	=	11.71	x	0.16	0.64	1.44	=	5.6 gal = (3 vol.)

Time	1351	1400	1417				
Volume Purged (gals)	1.50	1.50	2.80				
Cumulative Volume Purged (gals)	1.50	3.0	5.8				
Cumulative Number of Casing Volumes	0.79	1.6	3.1				
Purge Rate (gpm)	0.13	0.16	0.16				
Temperature (F°) or (C°)	19.8	19.8	19.7				
pH	7.28	7.17	7.21				
Specific Conductivity (µmhos/cm)	2,000	[illegible]	2000				
Dissolved Oxygen (mg/L)	—	—	—				
Turbidity/Color (NTU)	CLEAR	→	→				
Odor	SLIGHT PETROLEUM	ODER	→				
Dewatered?	No	→	→				

CHECKED BY: [signature] DATE: 2/5/98

ITSI

MONITORING WELL
PURGE AND SAMPLE FORM

PROJECT NAME: Port of Oakland, 2277 7th ST. PROJECT NO.: 951349

WELL NO: MW-5 TESTED BY: WKS DATE: 12-31-97

Measuring Point Description: MARK ON TOC

Total Well Depth (ft.): 17.68

Water Level Measurement Method: DUAL INTERFACE

Purge Method: PERISTALTIC PUMP

Time Start Purge: 10:18

Time End Purge: 10:50

Static Water Level (ft.): 6.38

Sample Method: PERISTALTIC PUMP

Time Sampled: 10:55

Sample Depth (ft.): > 6.5

Field Filtering: NONE

Field Preservation: HCl in VOAs, Blue Ice

Comments: 10ft @ TOC, no lock (installed 0895 lock), H2O in box (BS)

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)
	17.68	-	6.38	=	11.3	x	2	4	6	=	1.8
							0.16	0.64	1.44		5.4 (3 WELL VOL)

Time	10:24	10:35	10:42	10:50			
Volume Purged (gals)	0.75	2.0	1.75	1.0			
Cumulative Volume Purged (gals)	0.75	2.75	4.5	5.5			
Cumulative Number of Casing Volumes	0.42	1.53	2.5	3.1			
Purge Rate (gpm)	0.13	0.2	0.2	0.14			
Temperature (F°) or (C°)	17.8	18.4	18.0	18.1			
pH	7.10	6.97	7.00	7.05			
Specific Conductivity (µmhos/cm)	2,000	2,300	2,300	2,300			
Dissolved Oxygen (mg/L)	—	→	→	→			
Turbidity/Color (NTU)	CLEAR	→	→	→			
Odor	NONE	→	→	→			
Dewatered?	No	→	→	→			

CHECKED BY: [signature] DATE: 2/5/98

ITSI

MONITORING WELL
PURGE AND SAMPLE FORM

PROJECT NAME: Port of Oakland, 2277 7TH ST. PROJECT NO.: 95-113 49

WELL NO.: MW-7 TESTED BY: WKS DATE: 12-31-97

Measuring Point Description: MARK ON TOC

Total Well Depth (ft.): 18.15

Water Level Measurement Method: DUAL INTERFACE PROBE

Purge Method: PERISTALTIC PUMP

Time Start Purge: 9:24

Time End Purge: 9'48

Static Water Level (ft.): 8.88

Sample Method: PERISTALTIC PUMP

Time Sampled: 9'50

Sample Depth (ft.): > 90

Field Filtering: NONE

Field Preservation: HCl in VOA's - Blue Ice

Comments: Soft @ T.D.; no lock (Installed OBES rock) (JS)

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		1.5
	18.15		8.88		9.27		0.16	0.64	1.44		4.5 (3 WELL VOL.)

Time	9.29	9 33	9 41	9 48			
Volume Purged (gals)	0.5	0.75	1.5	1.75			
Cumulative Volume Purged (gals)	0.5	1.25	2.75	4.5			
Cumulative Number of Casing Volumes	0.33	0.83	1.8	3			
Purge Rate (gpm)	0.1	0.15	0.19	0.25			
Temperature (F°) or (C°)	18.7	19.6	20.1	20.2			
pH	7.09	7.10	7.12	7.13			
Specific Conductivity (µmhos/cm)	2,000	2,000	2000	2,000			
Dissolved Oxygen (mg/L)	→	→	→	→			
Turbidity/Color (NTU)	CLEAR	→	→	→			
Odor	NONE	→	→	→			
Dewatered?	No	→	→	→			

CHECKED BY: [signature] DATE: 2/5/98

ITSI

ATTACHMENT B

COPIES OF LABORATORY REPORTS, CHROMATOGRAMS AND CHAIN-OF-CUSTODY FORM FOR GROUNDWATER 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.
1330 Broadway Ste. 1625
Oakland, CA 94612

Date: 08-JAN-98
Lab Job Number: 131864
Project ID: 95-113.49 (2277 7th St.)
Location: Port of Oakland

Reviewed by: Damara Moore

Reviewed by:

Curtis & Tompkins, Ltd

Laboratory Number: **131864**
Client **Innovative Technical Solutions, Inc.**
Project# **95-113.49**
Location **Port of Oakland**

Receipt Date: **12/31/97**

Case Narrative

This hardcopy data package contains sample results and batch QC for six water samples and one trip blank which were received from the above referenced project on December 31st, 1997. All samples were received cold and intact.

TEH/Diesel and Motor Oil by EPA 8015 modifed: All samples analyzed for total extractable hydrocarbons were treated with silica gel prior to analysis.

No analytical problems were encountered.

TVH-Total Volatile Hydrocarbons

Client: Innovative Technical Solutions, Inc.
Project#: 95-113.49
Location: Port of Oakland

Analysis Method: TVH
Prep Method: EPA 5030

Sample #	Client ID	Batch #	Sampled	Extracted	Analyzed	Moisture
131864-001	TRAVEL BLANK	38395	12/31/97	01/07/98	01/07/98	
131864-002	MW-2	38395	12/31/97	01/07/98	01/07/98	
131864-003	MW-7	38395	12/31/97	01/07/98	01/07/98	
131864-004	MW-5	38395	12/31/97	01/07/98	01/07/98	

Matrix: Water

Analyte Diln Fac:	Units	131864-001 1	131864-002 1	131864-003 1	131864-004 1
Gasoline C7-C12	ug/L	<50	<50	<50	<50
Surrogate					
Bromofluorobenzene	%REC	93	84	100	85

BTXE

Client: Innovative Technical Solutions,Inc.
Project#: 95 113.49
Location: Port of Oakland

Analysis Method: EPA 8020A
Prep Method: EPA 5030

Sample #	Client ID	Batch #	Sampled	Extracted	Analyzed	Moisture
131864-001	TRAVEL BLANK	38395	12/31/97	01/07/98	01/07/98	
131864-002	MW-2	38395	12/31/97	01/07/98	01/07/98	
131864-003	MW-7	38395	12/31/97	01/07/98	01/07/98	
131864-004	MW-5	38395	12/31/97	01/07/98	01/07/98	

Matrix: Water

Analyte Diln Fac:	Units	131864-001 1	131864-002 1	131864-003 1	131864-004 1
Benzene	ug/L	<0.5	1.4	<0.5	<0.5
Toluene	ug/L	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	ug/L	<0.5	<0.5	<0.5	<0.5
m,p-Xylenes	ug/L	<0.5	<0.5	<0.5	<0.5
o-Xylene	ug/L	<0.5	<0.5	<0.5	<0.5
Surrogate					
Trifluorotoluene	%REC	89	80	83	86
Bromofluorobenzene	%REC	72	76	75	75

TVH-Total Volatile Hydrocarbons

Client: Innovative Technical Solutions, Inc.
Project#: 95-113.49
Location: Port of Oakland

Analysis Method: TVH
Prep Method: EPA 5030

Sample #	Client ID	Batch #	Sampled	Extracted	Analyzed	Moisture
131864-005	MW-4	38395	12/31/97	01/07/98	01/07/98	
131864-006	QC-1	38395	12/31/97	01/07/98	01/07/98	

Matrix: Water

Analyte	Units	131864-005	131864-006
Diln Fac:		1	1
Gasoline C7-C12	ug/L	73 YL	67 YL
Surrogate			
Bromofluorobenzene	%REC	101	91

Y: Sample exhibits fuel pattern which does not resemble standard
L: Lighter hydrocarbons than indicated standard

BTXE

Client: Innovative Technical Solutions, Inc.
Project#: 95-113.49
Location: Port of Oakland

Analysis Method: EPA 8020A
Prep Method: EPA 5030

Sample #	Client ID	Batch #	Sampled	Extracted	Analyzed	Moisture
131864-005	MW-4	38395	12/31/97	01/07/98	01/07/98	
131864-006	QC-1	38395	12/31/97	01/07/98	01/07/98	

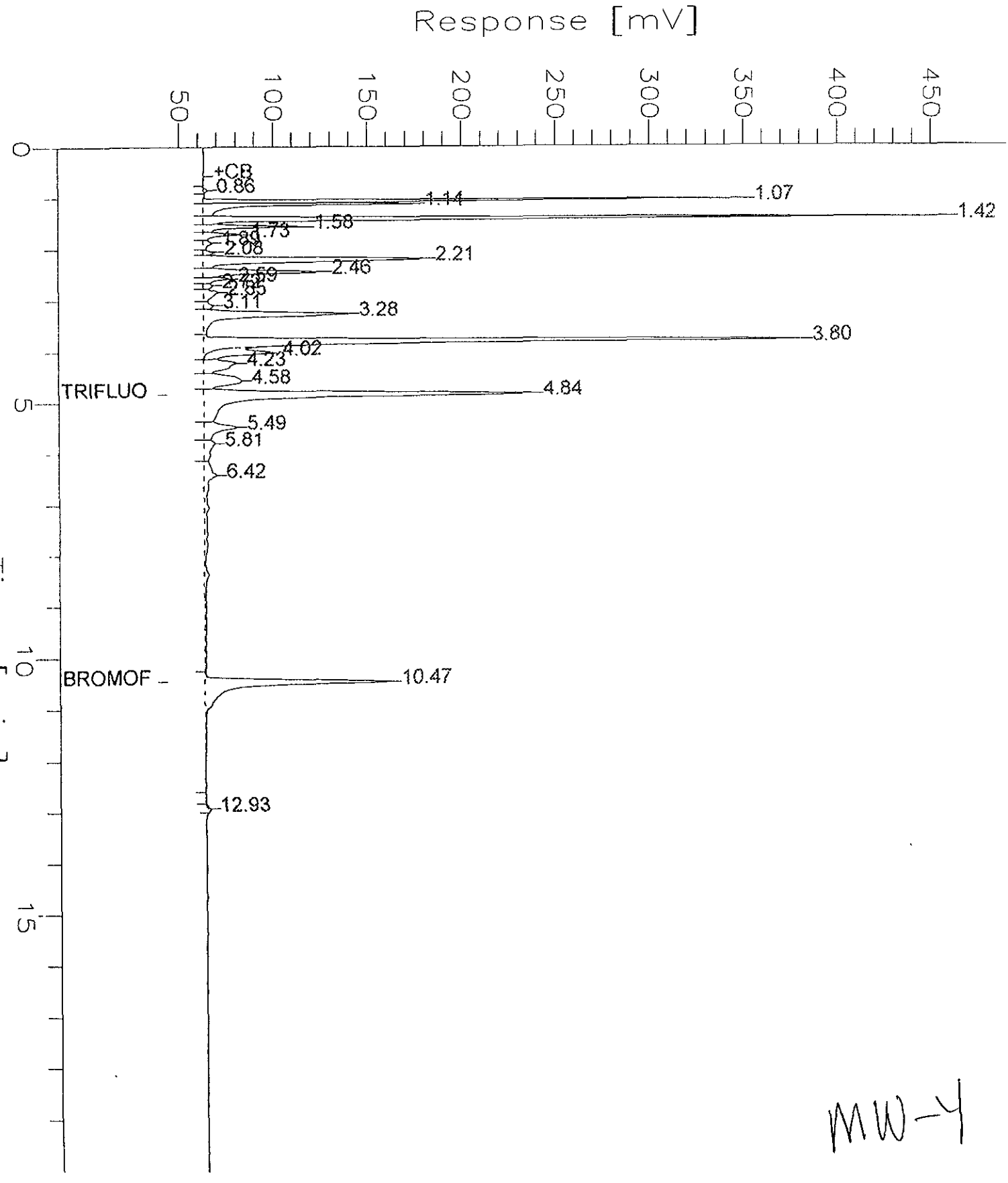
Matrix: Water

Analyte	Units	131864-005	131864-006
Diln Fac:		1	1
Benzene	ug/L	110	100
Toluene	ug/L	1	1.2
Ethylbenzene	ug/L	<0.5	<0.5
m,p-Xylenes	ug/L	<0.5	<0.5
o-Xylene	ug/L	<0.5	<0.5
Surrogate			
Trifluorotoluene	%REC	83	82
Bromofluorobenzene	%REC	74	71

GC04 TVH 'J' Data File Rtx1FID

Sample Name : S,131864-005,38395,
FileName : G:\GC04\DATA\006J034.raw
Method : TVHBTXE
Start Time : 0.00 min End Time : 20.00 min
Scale Factor: 1.0 Plot Offset: 43 mV

Sample #: Page 1 of 1
Date : 1/7/98 03:31 AM
Time of Injection: 1/7/98 03:11 AM
Low Point : 42.78 mV High Point : 459.12 mV
Plot Scale: 416.3 mV

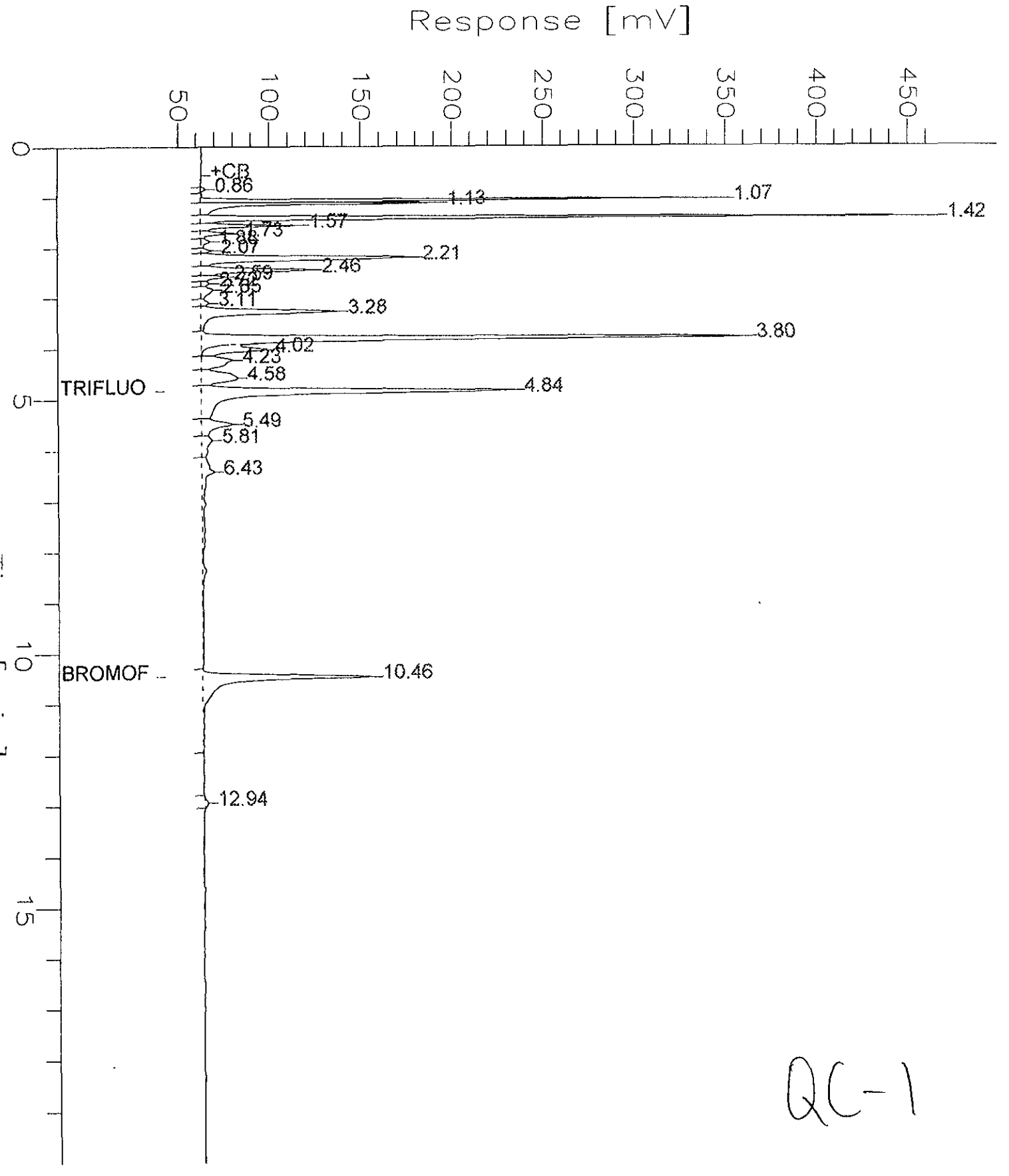


MW-4

GC04 TVH 'J' Data File Rtx1FID

Sample Name : S,131864-006,38395,
FileName : G:\GC04\DATA\006J030.raw
Method : TVHBTXE
Start Time : 0.00 min End Time : 20.00 min
Scale Factor: 1.0 Plot Offset: 42 mV

Sample #:
Date : 1/7/98 01:37 AM
Time of Injection: 1/7/98 01:17 AM
Low Point : 42.07 mV High Point : 466.87 mV
Plot Scale: 424 8 mV

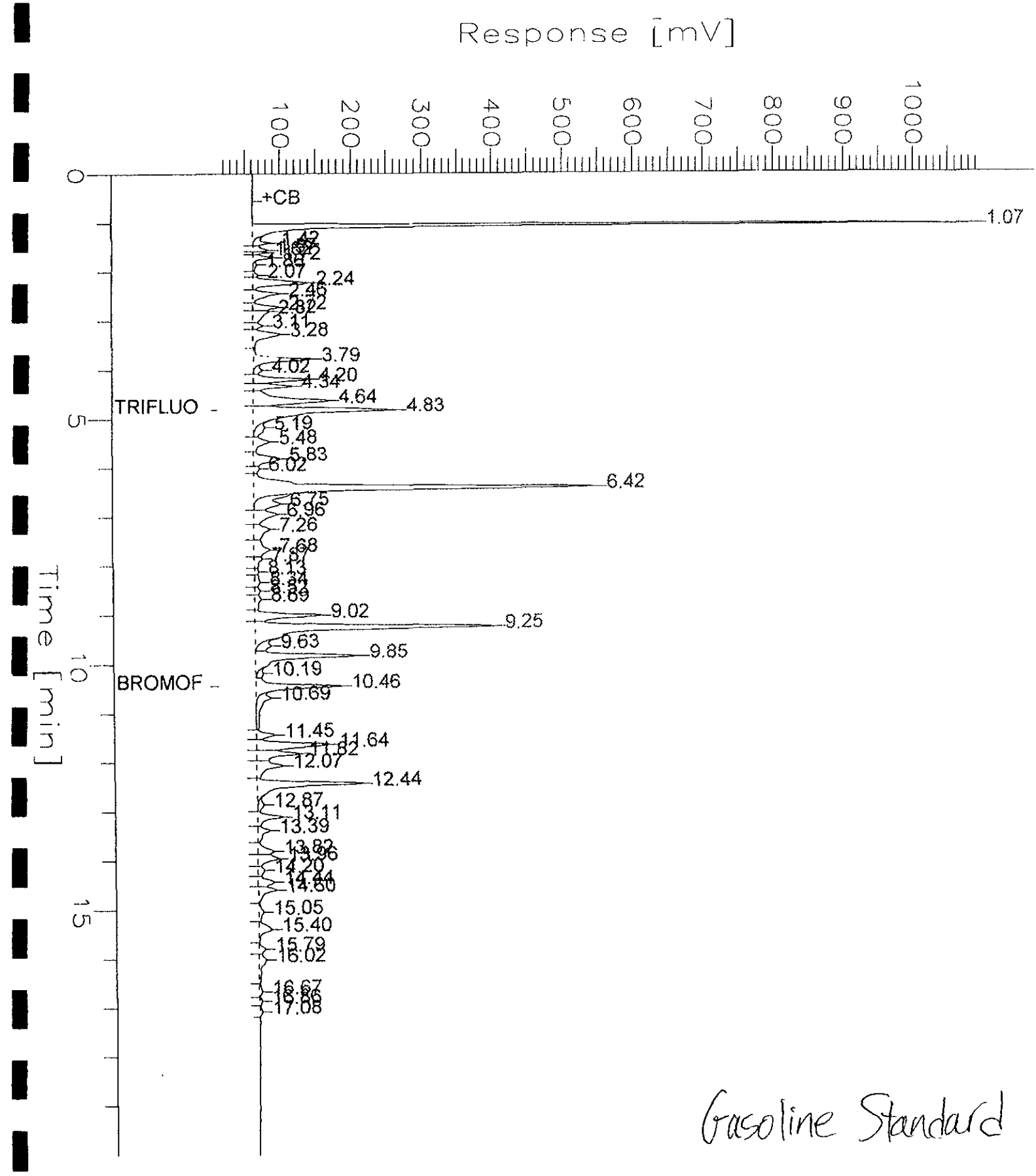


QC-1

GC04 TVH 'J' Data File Rtx1FID

Sample Name : CCV/LCS,QC61698,97WS5166,38395
FileName : G:\GC04\DATA\006J010.raw
Method : TVHBTXE
Start Time : 0.00 min End Time : 20.00 min
Scale Factor: 1.0 Plot Offset: 10 mV

Sample #: GAS Page 1 of 1
Date : 1/6/98 05.02 PM
Time of Injection: 1/6/98 03:48 PM
Low Point : 10.17 mV High Point : 1092.88 mV
Plot Scale: 1082.7 mV



Gasoline Standard

TVH-Total Volatile Hydrocarbons

Client:	Innovative Technical Solutions,Inc.	Analysis Method:	TVH
Project#:	95-113.49	Prep Method:	EPA 5030
Location:	Port of Oakland		

METHOD BLANK

Matrix:	Water	Prep Date:	01/06/98
Batch#:	38395	Analysis Date:	01/06/98
Units:	ug/L		
Diln Fac:	1		

MB Lab ID: QC61700

Analyte	Result	
Gasoline C7-C12	<50	
Surrogate	**%Rec**	**Recovery Limits**
Bromofluorobenzene	73	70-122

Lab #: 131864

BATCH QC REPORT

Curtis & Tompkins Ltd.

BTXE

Client:	Innovative Technical Solutions, Inc.	Analysis Method	EPA 8020A
Project#:	95-113.49	Prep Method:	EPA 5030
Location:	Port of Oakland		

METHOD BLANK

Matrix:	Water	Prep Date:	01/06/98
Batch#:	38395	Analysis Date:	01/06/98
Units:	ug/L		
Diln Fac:	1		

MB Lab ID: QC61700

Analyte	Result
Benzene	<0.5
Toluene	<0.5
Ethylbenzene	<0.5
m,p-Xylenes	<0.5
o-Xylene	<0.5

Surrogate	%Rec	Recovery Limits
Trifluorotoluene	84	58-130
Bromofluorobenzene	64	62-131

TVH-Total Volatile Hydrocarbons

Client: Innovative Technical Solutions, Inc.
Project#: 95-113.49
Location: Port of Oakland

Analysis Method: TVH
Prep Method: EPA 5030

LABORATORY CONTROL SAMPLE

Matrix: Water
Batch#: 38395
Units: ug/L
Diln Fac: 1

Prep Date: 01/06/98
Analysis Date: 01/06/98

LCS Lab ID: QC61698

Analyte	Result	Spike Added	%Rec #	Limits
Gasoline C7-C12	1976	2000	99	80-120

Surrogate	%Rec	Limits
Bromofluorobenzene	101	70-122

Column to be used to flag recovery and RPD values with an asterisk
* Values outside of QC limits
Spike Recovery: 0 out of 1 outside limits

BTXE

Client: Innovative Technical Solutions, Inc.
Project#: 95-113.49
Location: Port of Oakland

Analysis Method: EPA 8020A
Prep Method: EPA 5030

LABORATORY CONTROL SAMPLE

Matrix: Water
Batch#: 38395
Units: ug/L
Diln Fac: 1

Prep Date: 01/06/98
Analysis Date: 01/06/98

LCS Lab ID: QC61699

Analyte	Result	Spike Added	%Rec #	Limits
Benzene	17.24	20	86	80-120
Toluene	19.32	20	97	80-120
Ethylbenzene	19.27	20	96	80-120
m,p-Xylenes	40.92	40	102	80-120
o-Xylene	20.42	20	102	80-120

Surrogate	%Rec	Limits
Trifluorotoluene	87	58-130
Bromofluorobenzene	67	62-131

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

TVH-Total Volatile Hydrocarbons

Client:	Innovative Technical Solutions,Inc.	Analysis Method:	TVH
Project#:	95-113.49	Prep Method:	EPA 5030
Location:	Port of Oakland		

MATRIX SPIKE/MATRIX SPIKE DUPLICATE

Field ID:	ZZZZZZ	Sample Date:	12/23/97
Lab ID:	131823-001	Received Date:	12/24/97
Matrix:	Water	Prep Date:	01/06/98
Batch#:	38395	Analysis Date:	01/06/98
Units:	ug/L		
Diln Fac:	1		

MS Lab ID: QC61701

Analyte	Spike Added	Sample	MS	%Rec #	Limits
Gasoline C7-C12	2000	<50	1889	94	75-125
Surrogate	**%Rec**	**Limits**			
Bromofluorobenzene	106	70-122			

MSD Lab ID: QC61702

Analyte	Spike Added	MSD	%Rec #	Limits	RPD #	Limit
Gasoline C7-C12	2000	1828	91	75-125	3	35
Surrogate	**%Rec**	**Limits**				
Bromofluorobenzene	105	70-122				

Column to be used to flag recovery and RPD values with an asterisk
* Values outside of QC limits
RPD: 0 out of 1 outside limits
Spike Recovery: 0 out of 2 outside limits

TEH-Tot Ext Hydrocarbons

Client: Innovative Technical Solutions, Inc.
Project#: 95-113.49
Location: Port of Oakland

Analysis Method: EPA 8015M
Prep Method: EPA 3520

Sample #	Client ID	Batch #	Sampled	Extracted	Analyzed	Moisture
131864-002	MW-2	38391	12/31/97	01/05/98	01/07/98	
131864-003	MW-7	38391	12/31/97	01/05/98	01/07/98	
131864-004	MW-5	38391	12/31/97	01/05/98	01/07/98	
131864-005	MW-4	38391	12/31/97	01/05/98	01/08/98	

Matrix: Water

Analyte	Units	131864-002	131864-003	131864-004	131864-005
Diln Fac:		1	1	1	1
Diesel C12-C22	ug/L	<47	53 YL	<47	<47
Motor Oil C22-C50	ug/L	<280	<280	<280	<280
Surrogate					
Hexacosane	%REC	104	105	100	88

Y: Sample exhibits fuel pattern which does not resemble standard
L: Lighter hydrocarbons than indicated standard

Curtis & Tompkins Ltd

TEH-Tot Ext Hydrocarbons

Client: Innovative Technical Solutions,Inc.
Project#: 95-113.49
Location: Port of Oakland

Analysis Method: EPA 8015M
Prep Method: EPA 3520

Sample #	Client ID	Batch #	Sampled	Extracted	Analyzed	Moisture
131864-006	QC-1	38391	12/31/97	01/05/98	01/08/98	

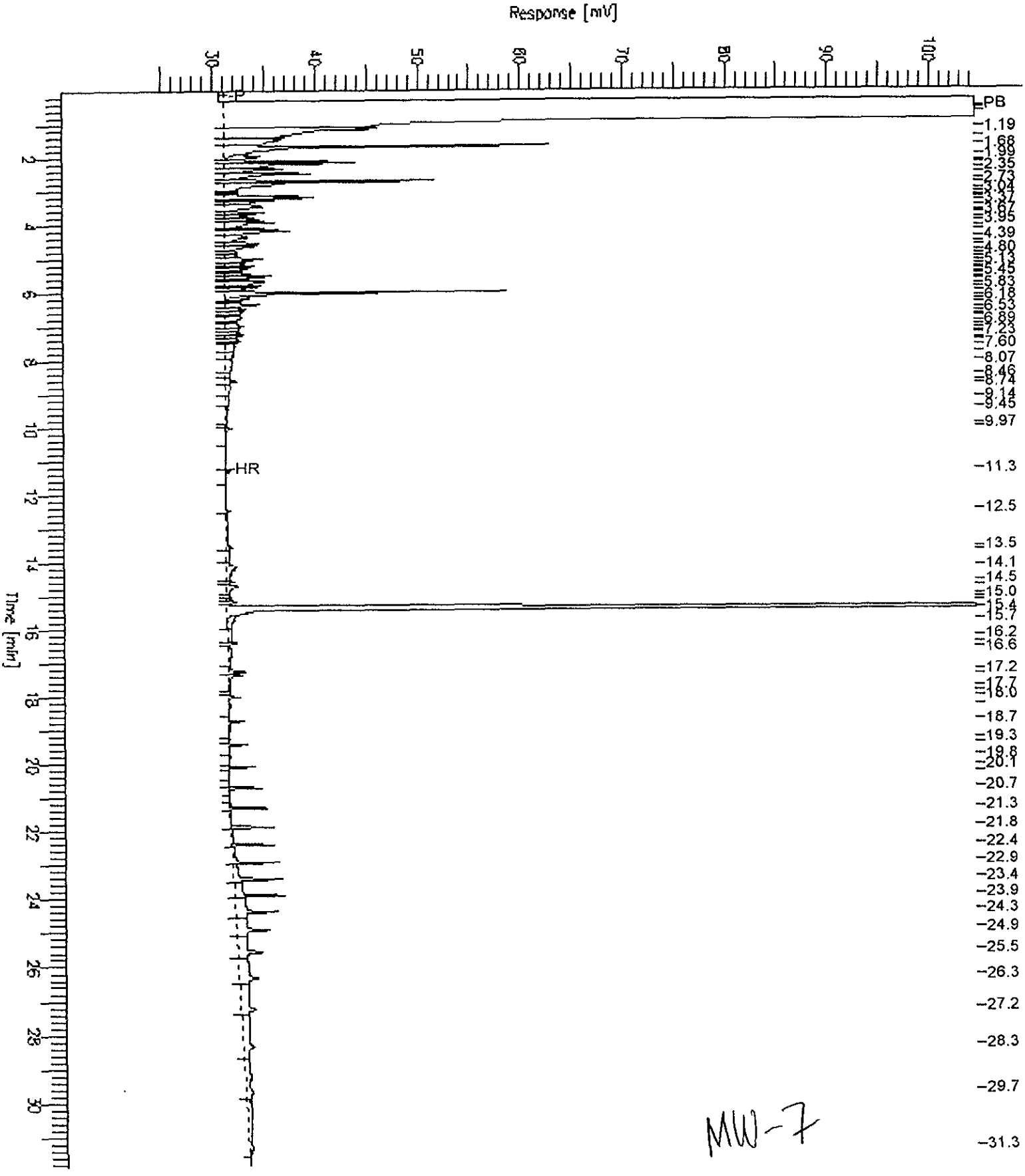
Matrix: Water

Analyte	Units	131864-006
Diln Fac:		1
Diesel C12-C22	ug/L	<47
Motor Oil C22-C50	ug/L	<280
Surrogate		
Hexacosane	%REC	118

Chromatogram

Sample #: 38391 Page 1 of 1
Date : 1/8/98 10:01 AM
Time of Injection: 1/7/98 10:28 PM
Low Point : 24.23 mV High Point : 104.55 mV
Plot Scale: 80.3 mV

Start Time : 0.01 min End Time : 31.91 min
Scale Factor: 0.0 Plot Offset: 24 mV

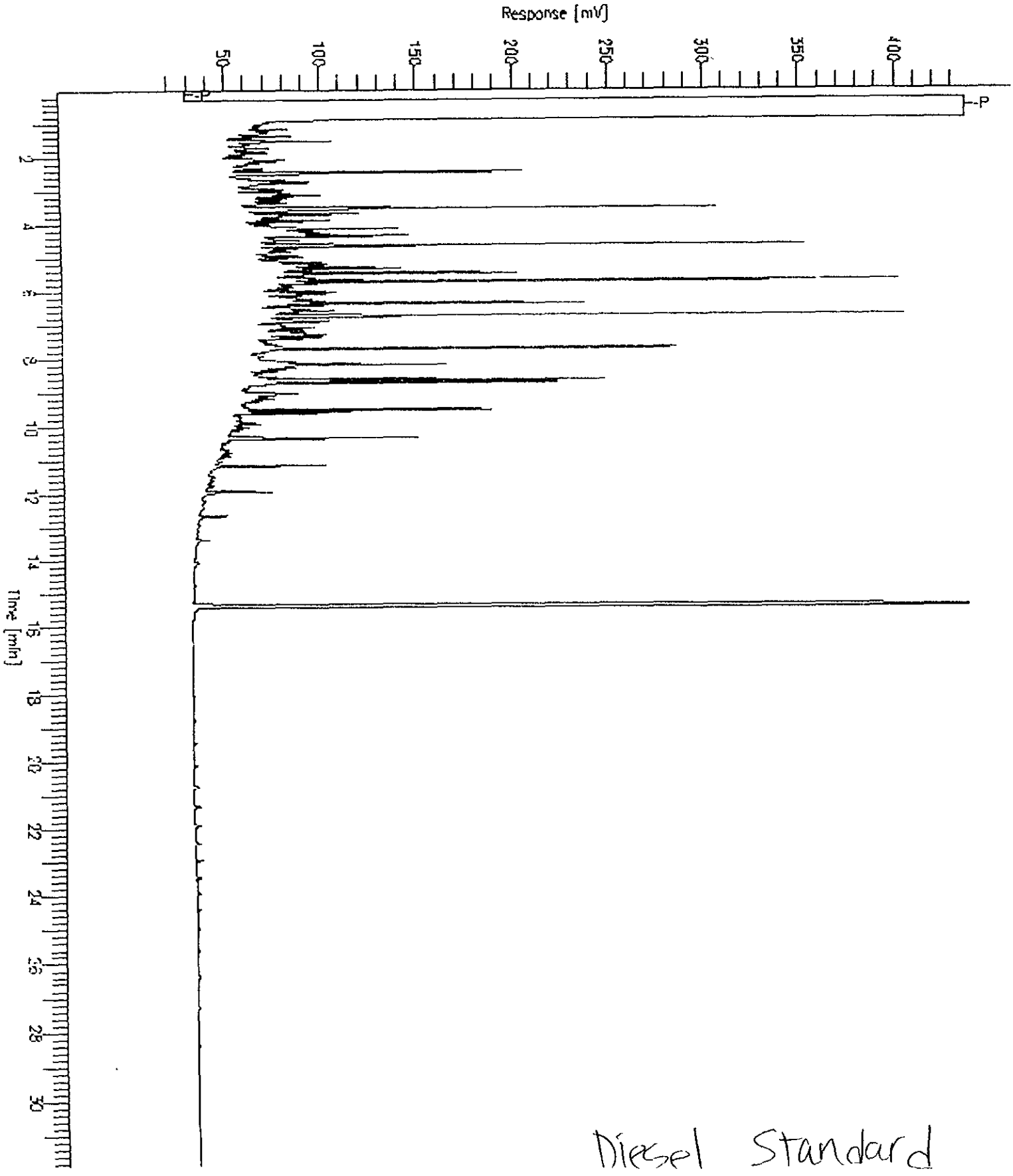


MW-7

Chromatogram

Sample Name : CCV,97WS5204,DS
FileName : G:\GC11\CHA\007A002.RAW
Method : ATEH363.MTH
Start Time : 0.01 min End Time : 31.91 min
Scale Factor: 0.0 Plot Offset: 11 mV

Sample #: 500MG/L Page 1 of 1
Date : 1/8/98 12:28 PM
Time of Injection: 1/7/98 12:53 PM
Low Point : 10.74 mV High Point : 436.81 mV
Plot Scale: 426.1 mV

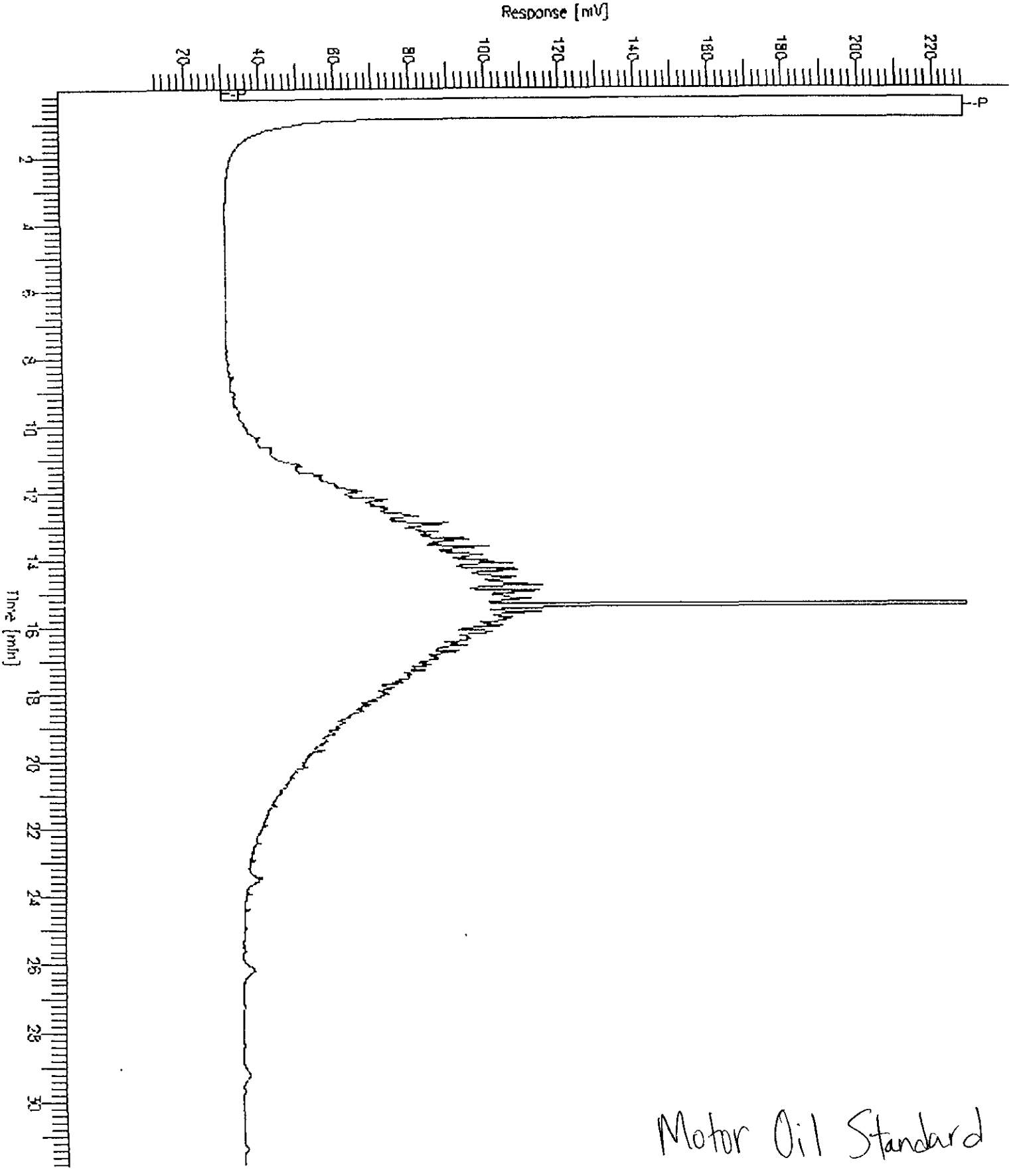


Diesel Standard

Chromatogram

Sample Name : ccv,97ws5160,mo
FileName : G:\GC11\CHA\007A005.RAW
Method . ATEH363.MTH
Start Time : 0.01 min End Time : 31.91 min
Scale Factor: 0.0 Plot Offset: 11 mV

Sample #: 500mg/l Page 1 of 1
Date : 1/8/98 12:28 PM
Time of Injection: 1/7/98 03:13 PM
Low Point : 10.65 mV High Point : 228.44 mV
Plot Scale: 217.8 mV



Motor Oil Standard

TEH-Tot Ext Hydrocarbons

Client:	Innovative Technical Solutions,Inc.	Analysis Method:	EPA 8015M
Project#:	95-113.49	Prep Method:	EPA 3520
Location:	Port of Oakland		

METHOD BLANK

Matrix:	Water	Prep Date:	01/05/98
Batch#:	38391	Analysis Date:	01/07/98
Units:	ug/L		
Diln Fac:	1		

MB Lab ID: QC61681

Analyte	Result
Diesel C12-C22	<50
Motor Oil C22-C50	<300

Surrogate	%Rec	Recovery Limits
Hexacosane	97	60-140

Lab #: 131864

BATCH QC REPORT

Curtis & Tompkins Ltd

TEH-Tot Ext Hydrocarbons

Client: Innovative Technical Solutions, Inc.
Project#: 95-113.49
Location: Port of Oakland

Analysis Method: EPA 8015M
Prep Method: EPA 3520

BLANK SPIKE/BLANK SPIKE DUPLICATE

Matrix: Water
Batch#: 38391
Units: ug/L
Diln Fac: 1

Prep Date: 01/05/98
Analysis Date: 01/07/98

BS Lab ID: QC61682

Analyte	Spike Added	BS	%Rec	#	Limits
Diesel C12-C22	2475	1812	73		60-140
Surrogate	**%Rec**	**Limits**			
Hexacosane	93	60-140			

BSD Lab ID: QC61683

Analyte	Spike Added	BSD	%Rec	#	Limits	RPD	#	Limit
Diesel C12-C22	2475	1879	76		60-140	4		35
Surrogate	**%Rec**	**Limits**						
Hexacosane	98	60-140						

Column to be used to flag recovery and RPD values with an asterisk
* Values outside of QC limits
RPD: 0 out of 1 outside limits
Spike Recovery: 0 out of 2 outside limits

INNOVATIVE TECHNICAL SOLUTIONS, Inc.

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

CT# 131864

CHAIN OF CUSTODY

PROJECT NAME: 2277 7th Street, Port of Oakland
PROJECT NUMBER: 95-113.49
SITE LOCATION: 2277 7TH OAKLAND

DATE: 12-31-97
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 AND MOD. (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	SPECIAL INSTRUCTIONS/COMMENTS
-1	Travel Blank		12-31-97	8:00	1	1 VOA	Water	X												
-2	MW-2			9:00	1	1 liter A				X										
	MW-2			9:00	3	VOA's		X												
-3	MW-7			9:50	1	liter A				X										
	MW-7			9:50	3	VOA's		X												
-4	MW-5			10:55	1	liter A				X										
	MW-5			10:55	3	VOAs		X												
-5	MW-4			14:20	1	liter A				X										Slightly Elevated Hydrocarbons concentration
	MW-4			14:20	3	VOAs		X												
-6	QC-1			—	1	liter A				X										
	QC-1		↓	—	3	VOAs	↓	X												
				NOT	USED															
	TOTAL NUMBER OF CONTAINERS				21	TOTAL TESTS		6		5										

Curtis & Tompkins Rush
WO # 078641

SAMPLED BY: William K Scott
SIGNATURE: William K Scott

SPECIAL INSTRUCTIONS/COMMENTS: STANDARD TAT, please provide Chromatograms

RELINQUISHED BY: William K Scott William K Scott
Printed Name Signature
ITSI 12-31-97 15 30
Company Date and Time

RECEIVED BY: Stephen Crane
Printed Name Signature
Curtis & Tompkins 12/31/97 15:30
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: Jim Schollard in Oakland ITSI Office