PORT OF OAKLAND

October 23, 1996

Mr. Barney Chan
Alameda County Health Care Services Agency
Department of Environmental Health
1131 Harbor Bay Parkway
Alameda, CA 94502

Subject: **Groundwater Monitoring at Former Seabreeze Yacht Center, Inc. Site**
280 6th Avenue, Oakland

Dear Mr. Chan:

Enclosed please find the results of the second quarterly monitoring of five wells at the former Seabreeze Yacht Center.

Also, for your information, removal of the concrete containment structure will commence next week. If you like, I can join you for a site inspection.

If you have any questions, please contact me at 272-1467.

Sincerely,

Diane Heinze

Diane Heinze, P.E.
Associate Environmental Scientist

enclosure

cc: Sum Arigala, RWQCB 2101 Webster Street, Suite 500, Oakland, CA 94612

cc: w/out enclosure:
Neil Werner
Mark O'Brien
Michele Heffes

C:\wp51\Seabreeze\cover.let

BASELINE
ENVIRONMENTAL CONSULTING

18 October 1996
S9171-C1

Ms. Diane Heinze
Port of Oakland
Environmental Department
530 Water Street
Oakland, California 94607

Subject: Quarterly Groundwater Monitoring Report, September 1996, Former Seabreeze Yacht Center, Inc. Site, 280 6th Avenue, Oakland, California

Dear Ms. Heinze:

This report documents the groundwater sampling activities performed on 12 and 16 September 1996 at the former Seabreeze Yacht Center, Inc. Site (Site), located in Oakland (Figure 1). The groundwater monitoring was conducted in accordance with the 7 June 1996 Port of Oakland (Port) letter to the Alameda County Health Care Services Agency, Department of Environmental Health (County). The groundwater monitoring network includes monitoring wells PW-2, MW-SB2, MW-SB3, MW-SB4, and MW-SB5 (Figure 2).

FIELD ACTIVITIES, SEPTEMBER 1996

On 12 September 1996, the presence of free product was checked and water levels were measured in the monitoring network wells using a dual-interface probe. Water levels were measured and recorded to the nearest one-hundredth of a foot. The dual-interface probe was decontaminated after each use by washing in a trisodium phosphate (TSP) solution and rinsing with deionized water. A slight sheen was identified in monitoring well MW-SB3; all other wells did not have any observable sheen or free product. An odor was identified in monitoring wells MW-SB2, MW-SB3, MW-SB4, and MW-SB5.

On 12 September, each monitoring well, except PW-2, was purged of approximately three to five well volumes using a double diaphragm pump with new, disposable PVC tubing after water level measurements. Twelve gallons of well water (approximately 1.7 well volumes) were removed from monitoring well PW-2 since the well pumped dry during purging of the second well volume. Electrical conductivity, pH, and temperature of the purge water were monitored during purging. The monitoring wells did not recover to 80 percent of original water levels on 12 September, since the recharge rate in all of the wells was too slow. Therefore, groundwater sampling occurred on 16 September 1996; at that time the groundwater levels had recovered to at least 80 percent of the original water levels for MW-SB4 and MW-SB5. The groundwater levels in monitoring wells PW-2, MW-SB2, and MW-SB3 recovered to 62, 53, and 78 percent, respectively, prior to sample collection.

Sample bottles were labeled and stored in a cooler containing blue ice. The groundwater samples were submitted under chain-of-custody protocol to Pace Analytical of Petaluma for analysis on the day of sampling. The groundwater samples were analyzed for total lead, total copper, and total extractable hydrocarbons (TEH) as diesel, motor oil, and Bunker C. The groundwater sample from MW-SB2 was also analyzed for mercury, arsenic, cadmium, chromium, iron, nickel, silver, and zinc. The samples collected for metals analyses were placed in unpreserved plastic containers; the samples were filtered at the laboratory prior to analysis. Prior to the TEH analysis, the samples were subjected to a silica gel cleanup (EPA Method 3630). The groundwater sampling forms, which document sampling activities, are included in Attachment A and the chain-of-custody form is included in Attachment B.

One drum containing purge and decontamination water was generated from the September 1996 sampling activities. The drum was labeled and stored on-site for subsequent disposal.

ANALYTICAL RESULTS

The metals and TEH analytical results are summarized in Table 1 and the laboratory reports are presented in Attachment B. Lead and copper were not identified in any of the monitoring wells above the laboratory reporting limits. Iron (0.13 mg/L) was identified in the sample from monitoring well MW-SB2. The samples from monitoring wells MW-SB2A (duplicate sample from MW-SB2) and MW-SB5 contained diesel at 0.17 mg/L and 0.14 mg/L, respectively. Motor oil was identified in sample MW-SB3 at 0.28 mg/L.

GROUNDWATER FLOW DIRECTION

Recently collected and historic groundwater elevation data are summarized in Table 2. The groundwater elevation data were used to calculate groundwater flow direction and gradient magnitude using the three point method for the September 1996 monitoring event. The groundwater flow direction was calculated as southeast at S46E, with a gradient magnitude of 0.01.

The next quarterly monitoring event will be conducted in December 1996. Should you have any questions, or need further information, please contact us at your convenience.

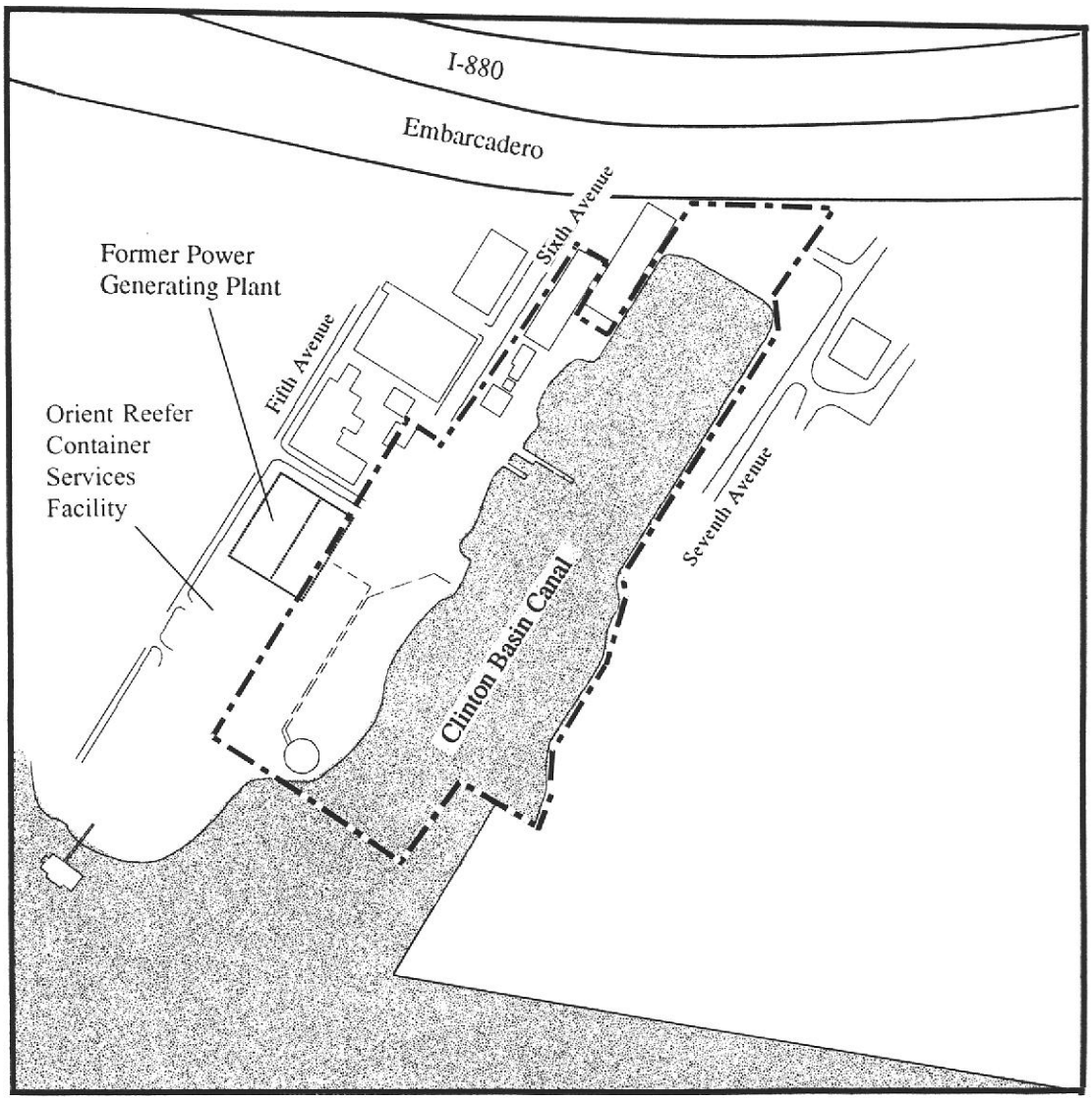
Sincerely,

Yane Nordhav
Principal
Reg. Geologist No. 4009

Rhodora Del Rosario
Civil Engineer

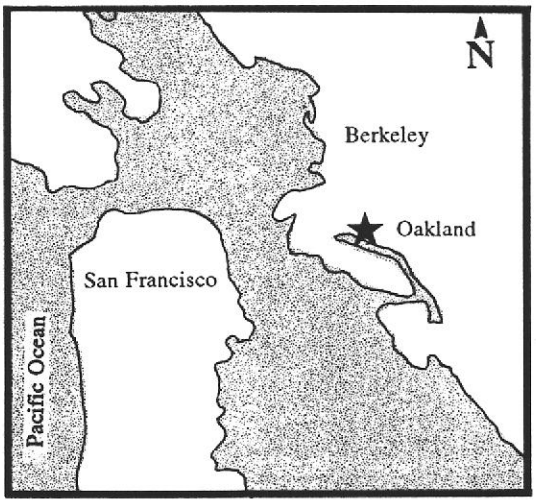
PROJECT AND REGIONAL LOCATION

Figure 1



Legend

— · — Seabreeze Yacht Center



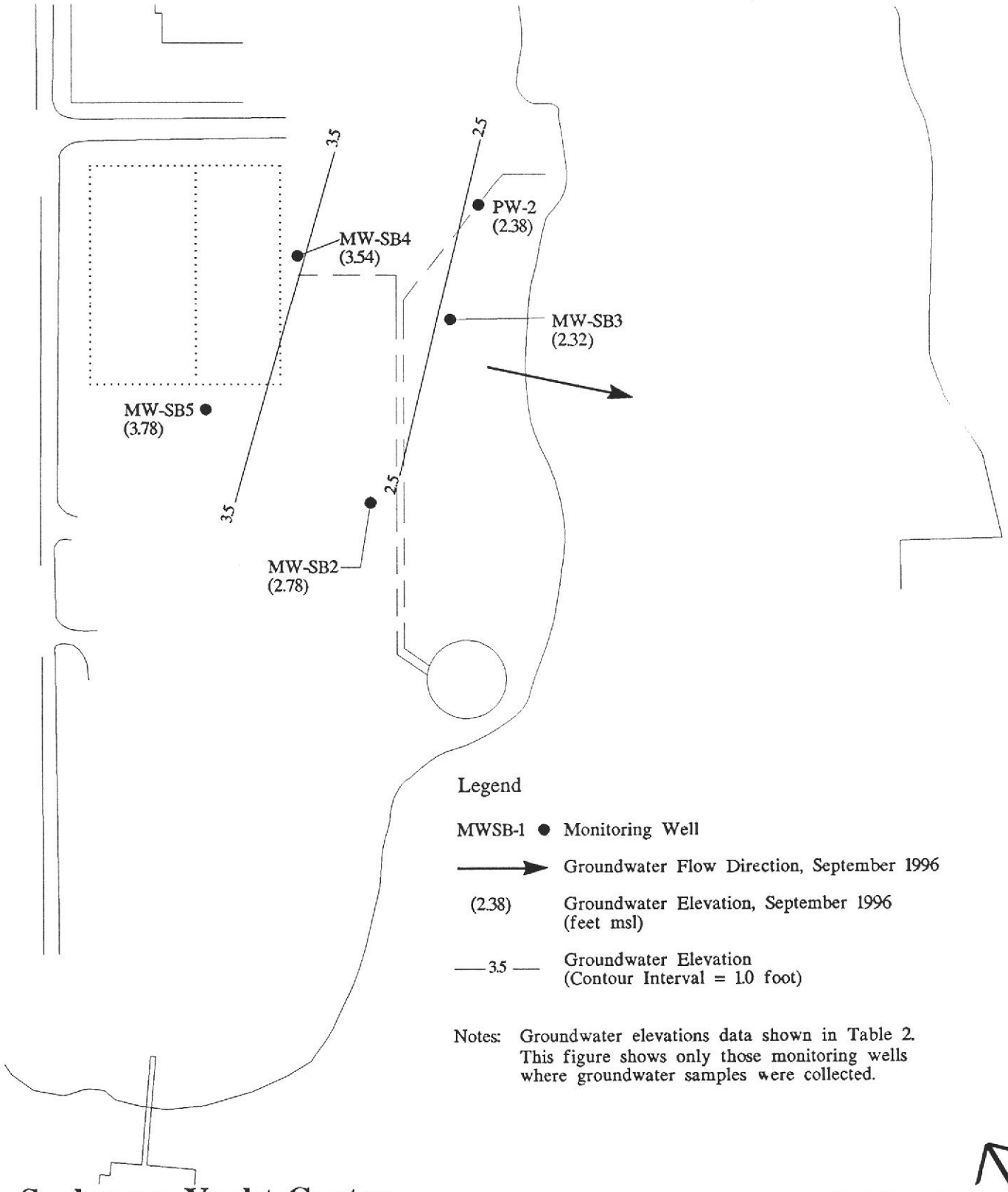
Seabreeze Yacht Center
Oakland, California

BASELINE

S9171-CO 8/18/95

MONITORING WELL LOCATIONS AND SEPTEMBER 1996 GROUNDWATER CONTOURS

Figure 2



Seabreeze Yacht Center
Sixth Avenue
Oakland, California

BASELINE

S9171-C1 10/7/96, Cadd File V/S9171MWL

TABLE 1
ANALYTICAL RESULTS
Seabreeze Yacht Center, Oakland, California
(mg/L)

Sample ID	Sample Date	Metals[1]		Total Extractable Hydrocarbons[2]		
		Lead	Copper	Diesel	Bunker C	Motor Oil
PW-2	2/2/95	**0.0043**	--	--	--	--
	3/6/95	--	--	**1.7**[3]	**4.4**[3]	**1.1**[3]
	7/1/96	<0.003	<0.01	<0.049[4]	<0.3[4]	--
	9/16/96	<0.003[10]	<0.005[11]	<0.05[4]	<0.5[4]	<0.25[4]
MW-SB2	4/9/91	<0.06[7]	<0.02[8]	--	--	--
	4/19/91	<0.07	**0.0481**	--	--	--
	1/10/94	<0.10[7]	<0.02[8]	--	--	--
	12/26/94	<0.0048[8]	**0.014**[8]	--	--	--
	3/6/95	--	--	**16.0**[3]/ **18.0**[3,5]	**28.0**[3]/ **33.0**[3,5]	**4.9**[3]/ <25.0[3,5]
	7/1/96	<0.003	**0.055**	<0.05[4]	<0.3[4]	--
	9/16/96[9]	<0.003[10]	<0.005[11]	<0.05[4]	<0.5[4]	<0.25[4]
MW-SB2A	7/1/96	<0.003	**0.065**	**0.17**[4,6]	<0.3[4]	--
	9/16/96	<0.003[10]	<0.005[11]	**0.17**[4]	<0.5[4]	<0.25[4]
MW-SB3	3/6/95	--	--	**4.5**[3]	**5.8**[3]	**1.5**[3]
	7/1/96	**0.0036**	<0.01	<0.049[4]	<0.3[4]	--
	9/16/96	<0.003[10]	<0.005[11]	<0.05[3,4]	<0.5[4]	**0.28**[3,4]
MW-SB4	3/3/95	--	--	**4.5**[3]	**3.0**[3]	**0.66**[3]
	7/1/96	**0.014**	**0.013**	<0.049[4]	<0.3[4]	--
	9/16/96	<0.003[10]	<0.005[11]	<0.05	<0.5	<0.25[4]
MW-SB5	3/6/95	--	--	**15.0**[3]/ **15.0**[3,5]	**34.0**[3]/ **31.0**[3,5]	**8.1**[3]/ **6.9**[3,5]
	7/1/96	**0.0031**	**0.012**	<0.049[4]	<0.3[4]	--
	9/16/96	<0.003[10]	<0.005[11]	**0.14**[3,4,12]	<0.5[4]	<0.25[4]

Notes: <x.x = analyte not identified above laboratory reporting limit of x.x.
x.x = concentrations reported at or above laboratory reporting limit.
x.x/x.x = duplicate sample.
-- = no analysis performed.
MW-SB2A = duplicate sample of MW-SB2.
Refer to Figure 2 for well locations.
Laboratory reports for the September 1996 sampling event are included in Attachment B.

1 Analytical Method EPA 6010A, unless otherwise noted.
2 Analytical Method California DOHS, LUFT Manual (EPA 8015M).
3 Sample chromatogram does not resemble hydrocarbon standard.
4 Samples were subjected to silica gel cleanup (EPA 3630) prior to analysis.

Table 1, *continued*

[5] Duplicate sample centrifuged prior to TEH analyses.
[6] Sample exhibited fuel pattern which did not resemble standard.
[7] Analyzed using EPA Method 7420.
[8] Analyzed using EPA Method 7210.
[9] Sample also analyzed for mercury, arsenic, cadmium, chromium, iron, nickel, silver, and zinc. All metals were reported below the corresponding laboratory reporting limits except for iron, which was identified at 0.13 mg/L.
[10] Analyzed using EPA method 7421. Sample filtered by the laboratory prior to analysis.
[11] Analyzed using EPA Method 7211. Sample filtered by the laboratory prior to analysis.
[12] Laboratory indicated that miscellaneous peaks were present in the diesel range.

TABLE 2

GROUNDWATER ELEVATION DATA
Seabreeze Yacht Center, Oakland, California

Well	Date	Time	Surface Elevation (msl)	TOC Elevation (msl)	Depth to Groundwater (feet)	Groundwater Elevation (msl)
PW-2[1]	2/15/95[2]	--	5.56	6.57	4.60	1.97
	3/3/95	9:10			3.90	2.67
	6/28/96	7:37			3.83	2.74
	9/16/96	8:54			4.19	2.38
MW-SB2[3]	4/19/91	11:09	6.2	7.18	5.38	1.8
	7/9/91	11:04			3.7	3.48
	1/10/94	12:31			3.08	4.1
	1/26/94	13:40			1.63	5.5
	11/14/94	7:30			4.8	2.38
		11:05			4.76	2.42
		14:14			4.73	2.45
	11/28/94	9:00			2.85	4.33
	3/3/95	8:50			2.84	4.34
	6/28/96	7:40			3.76	3.42
	9/16/96	9:01			4.30	2.88
MW-SB3[3]	11/14/94	7:25	6.0	8.10	8.23	-0.13
		11:00			8.14	-0.04
		14:12			8.07	0.03
	11/28/94	8:53			6.32	1.78
	12/06/94	8:37			6.15	1.95
	3/3/95	8:40			6.78	1.32
	6/28/96	7:35			5.46	2.64
	9/16/96	8:55			5.78	2.32
MW-SB4[4]	11/28/94	9:02	6.6	6.39	1.05	5.34
	3/3/95	8:35			0.90	5.49
	6/28/96	8:28			3.16	3.23
	9/16/96	8:52			2.85	3.54
MW-SB5[4]	11/28/94	8:40	6.9	6.30	6.32	-0.02
	3/3/95	9:00			2.54	3.76
	6/28/96	8:45			2.43	3.87
	9/16/96	10:15			2.52	3.78

Notes: 11/14/94: High tide 9:21; Low tide 15:50.
11/28/94: High tide 7:46.
2/15/95: High tide 5:14 and 18:03; Low tide 23:34.
3/3/95: High tide 13:14; Low tide 7:03.
6/28/96: High tide 11:41; Low tide 4:35.
9/16/96: High tide 2:57 and 14:57; Low tide 8:23 and 21:07.
-- = Unknown.
msl = Feet above mean sea level
TOC = Top of casing
Refer to Figure 2 for well locations.

Table 2, *continued*

[1] Well survey conducted by Bates & Bailey 2/8/95.
[2] Groundwater elevation measured by SOMA; all other elevations measured by BASELINE.
[3] Well survey conducted by Bates & Bailey 11/18/94.
[4] Well survey conducted by Bates & Bailey 11/28/94.

ATTACHMENT A

GROUNDWATER SAMPLING FORMS

GROUNDWATER SAMPLING

Project no.:	S9171-C1	Well no.:	PW-2	Date:	9/12/96
Project name:	Seabreeze Yacht Center	Depth of well from TOC (feet):	15		
Location:	260 6th Avenue	Well diameter (inch):	4		
	Oakland, CA	Screened interval from TOC (feet):	6.5-15.0		
Recorded by:	WKS	TOC elevation (feet):	6.57		
Weather:	Sunny	Water level from TOC (feet):	4.19	Time:	8:54
Precip in past		Product level from TOC (feet):	None	Time:	8:54
5 days (inch):	None	Water level measurement:	Dual interface probe		

VOLUME OF WATER TO BE REMOVED BEFORE SAMPLING:

[(15 ft) - (4.19 ft)] × (0.166 ft)² × 3.14 × 7.48 =

Well depth Water level Well radius

7.0 gallons in one well volume

35 gallons in 5 well volumes

12 total gallons removed

CALIBRATION:

	Time	Temp (° C)	pH	EC (µmho/cm)
Calibration Standard:			7.00	10,000
Before Purging:	9:10	20.5	7.00	9,000
After Purging:	12:19	23.8	6.91	9,000

FIELD MEASUREMENTS:

Time	Temp (° C)	pH	EC (µmho/cm)	Cumulative Gallons Removed	Appearance
9:15	20.5	6.74	11,000	2.5	Clear with black particulate matter
9:23	21.0	6.74	9,000	6	Clear with black particulate matter
9:28	21.3	6.70	9,000	7.5	Clear with black particulate matter
9:34	20.9	6.70	9,000	10	Clear with black particulate matter
9:41	20.0	6.81	9,000	12	Clear with black particulate matter
	WELL PUMPED DRY				

Notes: Recharge rate too slow to allow 80% recharge before sampling on 9/12/96. Sample collected on 9/16/96.
Water level during sample collection recovered to 62% of original water level.

Water level after purging prior to sampling (feet):	6.78	Time:	9/16/96 7:23
Appearance of sample:	Clear	Time:	9/16/96 7:30
Duplicate/blank number:	None	Time:	--
Purge method:	Double diaphragm pump		
Sampling equipment:	Disposable PVC bailer	VOC attachment:	None
Sample containers:	Two 1-liter amber glass, 1-liter plastic		
Sample analyses:	TEPH, copper, lead	Laboratory:	Pace Analytical
Decontamination method:	TSP and water, DI water rinse	Rinsate disposal:	MW-SB2 to 5 & PW-2

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GROUNDWATER SAMPLING

Project no.:	S9171-C1	Well no.:	MW-SB2	Date:	9/12/96
Project name:	Seabreeze Yacht Center	Depth of well from TOC (feet):	11.0		
Location:	260 6th Avenue	Well diameter (inch):	2		
	Oakland, CA	Screened interval from TOC (feet):	3-11		
Recorded by:	WKS	TOC elevation (feet):	7.18		
Weather:	Sunny	Water level from TOC (feet):	4.30	Time:	9:01
Precip in past		Product level from TOC (feet):	None	Time:	9:01
5 days (inch):	None	Water level measurement:	Dual interface probe		

VOLUME OF WATER TO BE REMOVED BEFORE SAMPLING:

[(11.0 ft) - (4.30 ft)] × (0.083 ft)² × 3.14 × 7.48 =
Well depth Water level Well radius

1.1 gallons in one well volume
5.5 gallons in 5 well volumes
4.75 total gallons removed

CALIBRATION:

	Time	Temp (° C)	pH	EC (µmho/cm)
Calibration Standard:			7.00	10,000
Before Purging:	9:10	20.5	7.00	9,000
After Purging:	12:19	23.8	6.91	9,000

FIELD MEASUREMENTS:

Time	Temp (° C)	pH	EC (µmho/cm)	Cumulative Gallons Removed	Appearance
10:20	21.7	6.73	12,000	0.25	Clear
10:30	21.6	6.65	10,000	2	Clear
10:40	21.2	6.66	9,000	4	Clear
10:45	19.7	6.83	10,000	4.75	Clear
WELL PUMPED DRY					

Note: Recharge rate too slow to allow 80% recharge before sampling on 9/12/96. Sample collected on 9/16/96. Water level during sample collection recovered to 53% of original water level.

Water level after purging prior to sampling (feet):	8.14	Time:	9/16/96 7:50
Appearance of sample:	Clear, sulfur odor	Time:	9/16/96 7:50
Duplicate/blank number:	MW-SB2A	Time:	9/16/96 8:00
Purge method:	Double diaphragm pump		
Sampling equipment:	Disposable PVC bailer	VOC attachment:	None
Sample containers:	Two 1-liter amber glass, 1-liter plastic		
Sample analyses:	TEPH, copper, lead	Laboratory:	Pace Analytical
Decontamination method:	TSP and water, DI water rinse	Rinsate disposal:	MW-SB2 to 5 & PW-2

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GROUNDWATER SAMPLING

Project no.:	S9171-C1	Well no.:	MW-SB3	Date:	9/12/96
Project name:	Seabreeze Yacht Center	Depth of well from TOC (feet):	11.06		
Location:	280 6th Street	Well diameter (inch):	2		
	Oakland, CA	Screened interval from TOC (feet):	4.86-11.06		
Recorded by:	WKS	TOC elevation (feet):	8.10		
Weather:	Sunny	Water level from TOC (feet):	5.78	Time:	8:55
Precip in past		Product level from TOC (feet):	None	Time:	8:55
5 days (inch):	None	Water level measurement:	Dual interface probe		

VOLUME OF WATER TO BE REMOVED BEFORE SAMPLING:

[(11.06 ft) - (5.78 ft)] × (0.083 ft)² × 3.14 × 7.48 =

(Well depth — Water level — Well radius)

0.85 gallons in one well volume

4.3 gallons in 5 well volumes

4.0 total gallons removed

CALIBRATION:

	Time	Temp (° C)	pH	EC (µmho/cm)
Calibration Standard:			7.00	10,000
Before Purging:	9:10	20.5	7.00	9,000
After Purging:	12:19	23.8	6.91	9,000

FIELD MEASUREMENTS:

Time	Temp (° C)	pH	EC (µmho/cm)	Cumulative Gallons Removed	Appearance
9:55	23.0	6.72	12,000	1.0	Clear with black particulates
10:03	23.5	6.65	12,500	2.0	Clear with black particulates
10:06	23.1	6.69	13,000	2.5	Clear with black particulates
10:09	22.6	6.83	13,500	4.0	Clear with black particulates

Notes: Recharge rate too slow to allow 80% recharge before sampling on 9/12/96. Sample collected on 9/16/96. Water level during sample collection recovered to 78% of original water level.

Water level after purging prior to sampling (feet):	7.41			Time:	9/16/96 7:35
Appearance of sample:	Clear to very slightly turbid with black sheen and petroleum odor			Time:	9/16/96 7:45
Duplicate/blank number:	None			Time:	--
Purge method:	Double diaphragm pump				
Sampling equipment:	Disposable PVC bailer	VOC attachment:	None		
Sample containers:	Two 1-liter amber glass, 1-liter plastic				
Sample analyses:	TEPH, copper, lead	Laboratory:	Pace Analytical		
Decontamination method:	TSP and water, DI water rinse	Rinsate disposal:	MW-SB2 to 5 & PW-2		

S9171SEP.XLS (10/9/96)

GROUNDWATER SAMPLING

Project no.:	S9171-C1	Well no.:	MW-SB4	Date:	9/12/96
Project name:	Seabreeze Yacht Center	Depth of well from TOC (feet):	14.75		
Location:	260 6th Avenue	Well diameter (inch):	2		
	Oakland, CA	Screened interval from TOC (feet):	2.55-14.75		
Recorded by:	WKS	TOC elevation (feet):	6.39		
Weather:	Sunny	Water level from TOC (feet):	2.85	Time:	8:52
Precip in past		Product level from TOC (feet):	Slight sheen	Time:	8:52
5 days (inch):	None	Water level measurement:	Dual interface probe		

VOLUME OF WATER TO BE REMOVED BEFORE SAMPLING:

[(14.75 ft) - (2.85 ft)] × (0.083 ft)² × 3.14 × 7.48 =
Well depth Water level Well radius

1.9 gallons in one well volume
9.5 gallons in 5 well volumes
10.5 total gallons removed

CALIBRATION:

	Time	Temp (° C)	pH	EC (µmho/cm)
Calibration Standard:			7.00	10,000
Before Purging:	9:10	20.5	7.00	9,000
After Purging:	12:19	23.8	6.91	9,000

FIELD MEASUREMENTS:

Time	Temp (° C)	pH	EC (µmho/cm)	Cumulative Gallons Removed	Appearance
11:00	20.2	6.76	7,500	1	Clear to very slightly turbid
11:04	22.0	6.72	2,300	2.5	Clear
11:09	22.3	6.66	2,000	4.5	Clear
11:15	21.8	6.66	3,900	7	Slightly turbid to clear
11:19	21.2	6.66	5,000	9	Slightly turbid to clear
	DECREASED FLOW RATE				
11:30	20.5	6.64	9,000	9.75	Slightly turbid to clear
11:36	20.7	6.67	9,000	10.5	Slightly turbid to clear

Notes: Recharge rate too slow to allow 80% recharge before sampling on 9/12/96. Sample collected on 9/16/96.
Water level during sample collection recovered to 99% of original water level.

Water level after purging prior to sampling (feet):	2.81	Time:	9/16/96 8:10
Appearance of sample:	Clear to very slightly turbid, petroleum odor	Time:	9/16/96 8:15
Duplicate/blank number:	None	Time:	--
Purge method:	Double diaphragm pump		
Sampling equipment:	Disposable PVC bailer	VOC attachment:	None
Sample containers:	Two 1-liter amber glass, 1-liter plastic		
Sample analyses:	TEPH, copper, lead	Laboratory:	Pace Analytical
Decontamination method:	TSP and water, DI water rinse	Rinsate disposal:	MW-SB2 to 5 & PW-2

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GROUNDWATER SAMPLING

Project no.:	S9171-C1	Well no.:	MW-SB5	Date:	9/12/96
Project name:	Seabreeze Yacht Center	Depth of well from TOC (feet):	14.75		
Location:	260 6th Avenue	Well diameter (inch):	2		
	Oakland, CA	Screened interval from TOC (feet):	2.55-14.75		
Recorded by:	WKS	TOC elevation (feet):	6.30		
Weather:	Sunny	Water level from TOC (feet):	2.52	Time:	10:15
Precip in past		Product level from TOC (feet):	None	Time:	10:15
5 days (inch):	None	Water level measurement:	Dual interface probe		

VOLUME OF WATER TO BE REMOVED BEFORE SAMPLING:

[(14.75 ft) - (2.52 ft)] × (0.083 ft)² × 3.14 × 7.48 =

Well depth Water level Well radius

2.0 gallons in one well volume
10.0 gallons in 5 well volumes
6 total gallons removed

CALIBRATION:

	Time	Temp (° C)	pH	EC (µmho/cm)
Calibration Standard:			7.00	10,000
Before Purging:	9:10	20.5	7.00	9,000
After Purging:	12:19	23.8	6.91	9,000

FIELD MEASUREMENTS:

Time	Temp (° C)	pH	EC (µmho/cm)	Cumulative Gallons Removed	Appearance
11:54	20.8	6.81	12,500	1	Light amber color
11:58	21.9	6.68	13,000	2	Light amber color
12:01	22.1	6.67	13,000	3	Light amber color
12:05	21.3	6.74	13,000	4	Light amber color
12:09	20.6	6.75	13,000	6	Light amber color

Notes: Recharge rate too slow to allow 80% recharge before sampling on 9/12/96. Sample collected on 9/16/96. Water level during sample collection recovered to 99% of original water level.

Water level after purging prior to sampling (feet):	2.55	Time:	9/16/96 8:20
Appearance of sample:	Light amber color, petroleum odor	Time:	9/16/96 8:30
Duplicate/blank number:	None	Time:	--
Purge method:	Double diaphragm pump		
Sampling equipment:	Disposable PVC bailer	VOC attachment:	None
Sample containers:	Two 1-liter amber glass, 1-liter plastic		
Sample analyses:	TEPH, copper, lead	Laboratory:	Pace Analytical
Decontamination method:	TSP and water, DI water rinse	Rinsate disposal:	MW-SB2 to 5 & PW-2

S9171SEP.XLS (10/9/96)

ATTACHMENT B

LABORATORY REPORTS

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

Pace Analytical

October 7, 1996

Ms. Rhodora DelRosario
Baseline
5900 Hollis Street, Suite D
Emeryville, CA 94608

RE: PACE Project Number : 706592
Client Project ID: Port of Oakland-Biosite

Dear Ms. DelRosario:

Enclosed are the revised QC report for Diesel, and a copy of our Quality Assurance Manual. I apologize for any inconvenience this may have caused you. If you have any further concerns, please feel free to contact me or Ron Chew at the laboratory.

Sincerely,

Pamela A. Schemmer

Pamela A. Schemmer
Quality Assurance Officer

enclosures

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

Pace Analytical

DATE: 10/01/96
PAGE: 1

Baseline
00 Hollis Street, Suite D
eryville, CA 94608

PACE Project Number: 706592
Client Project ID: Port of Oakland-Biosite

tn: Ms. Rhodora DelRosario
one: (510)420-8686

CE Sample No: 70732003 Date Collected: 09/16/96
ient Sample ID: PW-2 Date Received: 09/16/96

Parameters	Results	Units	PRL	Analyzed	Method	Analyst	CAS#	Footnotes
etals								
Copper by Furnace, Method 7211								
Copper	ND	ug/L	5	09/25/96	EPA 7211	BBF	7440-50-8	
Date Digested				09/19/96				
Lead, AAS Furnace								
Lead	ND	ug/L	3	09/24/96	EPA 7421	BBF	7439-92-1	
Date Digested				09/19/96				
GC								
TPH in Water by 8015 Modified								
Diesel Fuel	ND	mg/L	0.05	09/24/96	TPH by EPA 8015M	wsn	11-84-7...	
Motor Oil	ND	mg/L	0.25	09/24/96	TPH by EPA 8015M	wsn		
Bunker C	ND	mg/L	0.5	09/24/96	TPH by EPA 8015M	wsn		
n-Pentacosane (S)	112	%		09/24/96	TPH by EPA 8015M	wsn	629-99-2	
Date Extracted				09/18/96				

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: 706592
Client Project ID: Port of Oakland-Biosite

PACE Sample No: 70732011 Date Collected: 09/16/96
Client Sample ID: MW-SB2 Date Received: 09/16/96

Parameters	Results	Units	PRL	Analyzed	Method	Analyst	CAS#	Footnotes
Metals								
Copper by Furnace, Method 7211								
Copper	ND	ug/L	5	09/25/96	EPA 7211	BBF	7440-50-8	
Date Digested				09/19/96				
Lead, AAS Furnace								
Lead	ND	ug/L	3	09/24/96	EPA 7421	BBF	7439-92-1	
Date Digested				09/19/96				
TPH in Water by 8015 Modified								
Diesel Fuel	ND	mg/L	0.05	09/24/96	TPH by EPA 8015M	wsn	11-84-7...	
Motor Oil	ND	mg/L	0.25	09/24/96	TPH by EPA 8015M	wsn		
Bunker C	ND	mg/L	0.5	09/24/96	TPH by EPA 8015M	wsn		
n-Pentacosane (S)	64	%		09/24/96	TPH by EPA 8015M	wsn	629-99-2	
Date Extracted				09/18/96				

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
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Petaluma, CA 94954
Tel: 707-792-1865
Fax: 707-792-0342

Pace Analytical

PACE Project Number: 706592
Client Project ID: Port of Oakland-Biosite

PACE Sample No: 70732029 Date Collected: 09/16/96
Client Sample ID: MW-SB3 Date Received: 09/16/96

Parameters	Results	Units	PRL	Analyzed	Method	Analyst	CAS#	Footnotes
Metals								
Copper by Furnace, Method 7211								
Copper	ND	ug/L	5	09/25/96	EPA 7211	BBF	7440-50-8	
Date Digested				09/19/96				
Lead, AAS Furnace								
Lead	ND	ug/L	3	09/24/96	EPA 7421	BBF	7439-92-1	
Date Digested				09/19/96				
GC								
TPH in Water by 8015 Modified								
Diesel Fuel	ND	mg/L	0.05	09/26/96	TPH by EPA 8015M	wsn	11-84-7...	
Motor Oil	0.28	mg/L	0.25	09/26/96	TPH by EPA 8015M	wsn		1
Bunker C	ND	mg/L	0.5	09/26/96	TPH by EPA 8015M	wsn		
n-Pentacosane (S)	76	%		09/26/96	TPH by EPA 8015M	wsn	629-99-2	
Date Extracted				09/18/96				

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: 706592
Client Project ID: Port of Oakland-Biosite

PACE Sample No: 70732037 Date Collected: 09/16/96
Client Sample ID: MW-SB4 Date Received: 09/16/96

Parameters	Results	Units	PRL	Analyzed	Method	Analyst	CAS#	Footnotes
Metals								
Copper by Furnace, Method 7211								
Copper	ND	ug/L	5	09/25/96	EPA 7211	BBF	7440-50-8	
Date Digested				09/19/96				
Lead, AAS Furnace								
Lead	ND	ug/L	3	09/24/96	EPA 7421	BBF	7439-92-1	
Date Digested				09/19/96				
GC								
TPH in Water by 8015 Modified								
Diesel Fuel	ND	mg/L	0.05	09/26/96	TPH by EPA 8015M	wsn	11-84-7...	
Motor Oil	ND	mg/L	0.25	09/26/96	TPH by EPA 8015M	wsn		
Bunker C	ND	mg/L	0.5	09/26/96	TPH by EPA 8015M	wsn		
n-Pentacosane (S)	72	%		09/26/96	TPH by EPA 8015M	wsn	629-99-2	
Date Extracted				09/18/96				

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: 706592
Client Project ID: Port of Oakland-Biosite

PACE Sample No: 70732045 Date Collected: 09/16/96
Client Sample ID: MW-SB5 Date Received: 09/16/96

Parameters	Results	Units	PRL	Analyzed	Method	Analyst	CAS#	Footnotes
Metals								
Copper by Furnace, Method 7211								
Copper	ND	ug/L	5	09/25/96	EPA 7211	BBF	7440-50-8	
Date Digested				09/19/96				
Lead, AAS Furnace								
Lead	ND	ug/L	3	09/24/96	EPA 7421	BBF	7439-92-1	
Date Digested				09/19/96				
TPH in Water by 8015 Modified								
Diesel Fuel	0.14	mg/L	0.05	09/26/96	TPH by EPA 8015M	wsn	11-84-7...	1,2
Motor Oil	ND	mg/L	0.25	09/26/96	TPH by EPA 8015M	wsn		
Bunker C	ND	mg/L	0.5	09/26/96	TPH by EPA 8015M	wsn		
n-Pentacosane (S)	76	%		09/26/96	TPH by EPA 8015M	wsn	629-99-2	
Date Extracted				09/18/96				

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
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Petaluma, CA 94954
Tel: 707-792-1865
Fax: 707-792-0342

Pace Analytical

PACE Project Number: 706592
Client Project ID: Port of Oakland-Biosite

PACE Sample No: 70732052 Date Collected: 09/16/96
Client Sample ID: MW-SB2A Date Received: 09/16/96

Parameters	Results	Units	PRL	Analyzed	Method	Analyst	CAS#	Footnotes
Metals								
Copper by Furnace, Method 7211								
Copper	ND	ug/L	5	09/25/96	EPA 7211	BBF	7440-50-8	
Date Digested				09/19/96				
Lead, AAS Furnace								
Lead	ND	ug/L	3	09/24/96	EPA 7421	BBF	7439-92-1	
Date Digested				09/19/96				
GC								
TPH in Water by 8015 Modified								
Diesel Fuel	0.17	mg/L	0.05	09/26/96	TPH by EPA 8015M	wsn	11-84-7...	
Motor Oil	ND	mg/L	0.25	09/26/96	TPH by EPA 8015M	wsn		
Bunker C	ND	mg/L	0.5	09/26/96	TPH by EPA 8015M	wsn		
n-Pentacosane (S)	88	%		09/26/96	TPH by EPA 8015M	wsn	629-99-2	
Date Extracted				09/18/96				

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
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Petaluma, CA 94954
Tel: 707-792-1865
Fax: 707-792-0342

Pace Analytical

PACE Project Number: 706592
Client Project ID: Port of Oakland-Biosite

PACE Sample No: 70739206 Date Collected: 09/16/96
Client Sample ID: MW-SB2 Date Received: 09/16/96

Parameters	Results	Units	PRL	Analyzed	Method	Analyst	CAS#	Footnotes
Metals								
Mercury, CVAAS								
Mercury	ND	ug/L	0.2	09/30/96	EPA 7470	BBF	7439-97-6	
Arsenic, AAS Furnace								
Arsenic	ND	ug/L	5	09/27/96	EPA 7060	BBF	7440-38-2	
Date Digested				09/19/96				
Metals, ICP								
Cadmium	ND	ug/L	5	09/26/96	EPA 6010	BBF	7440-43-9	
Chromium	ND	ug/L	7	09/26/96	EPA 6010	BBF	7440-47-3	
Iron	130	ug/L	40	09/26/96	EPA 6010	BBF	7439-89-6	
Nickel	ND	ug/L	30	09/26/96	EPA 6010	BBF	7440-02-0	
Silver	ND	ug/L	7	09/26/96	EPA 6010	BBF	7440-22-4	
Zinc	ND	ug/L	100	09/26/96	EPA 6010	BBF	7440-66-6	
Date Digested				09/26/96				

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
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Petaluma, CA 94954
Tel: 707-792-1865
Fax: 707-792-0342

Pace Analytical

PACE Project Number: 706592
Client Project ID: Port of Oakland-Biosite

PARAMETER FOOTNOTES

ND	Not Detected
NC	Not Calculable
PRL	PACE Reporting Limit
(S)	Surrogate
[1]	Hydrocarbons present do not match profile of laboratory standard.
[2]	Miscellaneous peaks present in diesel range.

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

QUALITY CONTROL DATA

DATE: 10/07/96
PAGE: 9

[redacted]eline
[redacted]0 Hollis Street, Suite D
Emeryville, CA 94608

PACE Project Number: 706592
Client Project ID: Port of Oakland-Biosite

REVISED

Attn: Ms. Rhodora DelRosario
[redacted]ne: (510)420-8686

QC Batch ID: 17552 QC Batch Method: EPA 3520 Date of Batch: 09/18/96
Associated PACE Samples: 70732003 70732011 70732029 70732037 70732045 70732052

METHOD BLANK: 70733266
Associated PACE Samples:
70732003 70732011 70732029 70732037 70732045 70732052

Parameter	Units	Method Blank Result	PRL	Footnotes
Diesel Fuel	mg/L	ND	0.05	
Motor Oil	mg/L	ND	0.25	
Bunker C	mg/L	ND	0.5	
n-Pentacosane (S)	%	57		

LABORATORY CONTROL SAMPLE & LCSD: 70733274 70733282

Parameter	Units	Spike Conc.	LCS Result	Spike % Rec	LCSD Result	Spike Dup % Rec	RPD	Footnotes
Diesel Fuel	mg/L	1	0.625	63	0.68	68	8	
n-Pentacosane (S)				81		110		

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

QUALITY CONTROL DATA

DATE: 10/01/96
PAGE: 10

Baseline
5900 Hollis Street, Suite D
Emeryville, CA 94608

PACE Project Number: 706592
Client Project ID: Port of Oakland-Biosite

Attn: Ms. Rhodora DelRosario
Phone: (510)420-8686

QC Batch ID: 17570 QC Batch Method: EPA 3020 Date of Batch: 09/19/96
Associated PACE Samples: 70732003 70732011 70732029 70732037 70732045 70732052 70739206

METHOD BLANK: 70733886
Associated PACE Samples: 70732003 70732011 70732029 70732037 70732045 70732052 70739206

Parameter	Units	Method Blank Result	PRL	Footnotes
Copper	ug/L	ND	5	
Lead	ug/L	ND	3	
Arsenic	ug/L	ND	5	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 70733910 70733928

Parameter	Units	70725148	Spike Conc.	Matrix Spike Result	Spike % Rec	Matrix Sp. Dup. Result	Spike Dup % Rec	RPD	Footnotes
Copper	ug/L	12.8	20	28.51	78	28.35	77	1	
Lead	ug/L	ND	40	35.5	80	36.4	83	4	
Arsenic	ug/L	ND	40	42.3	98	41.4	96	2	

LABORATORY CONTROL SAMPLE & LCSD: 70733894 70733902

Parameter	Units	Spike Conc.	LCS Result	Spike % Rec	LCSD Result	Spike Dup % Rec	RPD	Footnotes
Copper	ug/L	20	21.1	106	21.05	105	1	
Lead	ug/L	40	38.7	97	38.1	95	2	
Arsenic	ug/L	40	42.5	106	42	105	1	

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

QUALITY CONTROL DATA

DATE: 10/01/96
PAGE: 11

Baseline
5900 Hollis Street, Suite D
Emeryville, CA 94608

PACE Project Number: 706592
Client Project ID: Port of Oakland-Biosite

Attn: Ms. Rhodora DelRosario
Phone: (510)420-8686

QC Batch ID: 17707
QC Batch Method: EPA 3010
Date of Batch: 09/25/96
Associated PACE Samples: 70739206

METHOD BLANK: 70738695
Associated PACE Samples: 70739206

Parameter	Units	Method Blank Result	PRL	Footnotes
Cadmium	ug/L	ND	5	
Chromium	ug/L	ND	7	
Iron	ug/L	ND	40	
Nickel	ug/L	ND	30	
Silver	ug/L	ND	7	
Zinc	ug/L	ND	100	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 70740436 70740444

Parameter	Units	70737135	Spike Conc.	Matrix Spike Result	Spike % Rec	Matrix Sp. Dup. Result	Spike Dup % Rec	RPD	Footnotes
Cadmium	ug/L	ND	200	208	104	208	104	0	
Chromium	ug/L	ND	2000	1880	94	1920	96	2	
Iron	ug/L	ND	20000	19100	95	19500	97	2	
Nickel	ug/L	ND	2000	1890	94	1930	97	3	
Silver	ug/L	ND	200	182	91	186	93	2	
Zinc	ug/L	ND	2000	1920	96	1960	98	2	

LABORATORY CONTROL SAMPLE & LCSD: 70740410 70740428

Parameter	Units	Spike Conc.	LCS Result	Spike % Rec	LCSD Result	Spike Dup % Rec	RPD	Footnotes
Cadmium	ug/L	200	205	103	208	104	1	
Chromium	ug/L	2000	1900	95	1910	95	0	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
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Tel: 707-792-1865
Fax: 707-792-0342

Pace Analytical

QUALITY CONTROL DATA

PACE Project Number: 706592
Client Project ID: Port of Oakland-Biosite

LABORATORY CONTROL SAMPLE & LCSD: 70740410 70740428

Parameter	Units	Spike Conc.	LCS Result	Spike % Rec	LCSD Result	Spike Dup % Rec	RPD	Footnotes
Iron	ug/L	20000	19300	97	19300	97	0	
Nickel	ug/L	2000	1940	97	1910	96	1	
Silver	ug/L	200	185	92	184	92	0	
Zinc	ug/L	2000	1950	98	1950	98	0	

REPORT OF LABORATORY ANALYSIS

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Petaluma, CA 94954
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Fax: 707-792-0342

Pace Analytical

QUALITY CONTROL DATA

DATE: 10/01/96
PAGE: 13

Baseline
5900 Hollis Street, Suite D
Emeryville, CA 94608

PACE Project Number: 706592
Client Project ID: Port of Oakland-Biosite

Attn: Ms. Rhodora DelRosario
Phone: (510)420-8686

QC Batch ID: 17816
QC Batch Method: EPA 7470
Date of Batch: 09/30/96
Associated PACE Samples: 70739206

METHOD BLANK: 70742051
Associated PACE Samples: 70739206

Parameter	Units	Method Blank Result	PRL	Footnotes
Mercury	ug/L	ND	0.2	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 70742069 70742077

Parameter	Units	70739206	Spike Conc.	Matrix Spike Result	Spike % Rec	Matrix Sp. Dup. Result	Spike Dup % Rec	RPD	Footnotes
Mercury	ug/L	ND	2	2.16	107	2.22	110	3	

LABORATORY CONTROL SAMPLE & LCSD: 70742085 70742093

Parameter	Units	Spike Conc.	LCS Result	Spike % Rec	LCSD Result	Spike Dup % Rec	RPD	Footnotes
Mercury	ug/L	2	2.19	110	2.19	110	0	

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: 706592
Client Project ID: Port of Oakland-Biosite

QUALITY CONTROL DATA PARAMETER FOOTNOTES

The Quality Control Sample Final Results listed above have been rounded to reflect an appropriate number of significant figures. Consistent with EPA guidelines unrounded concentrations 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

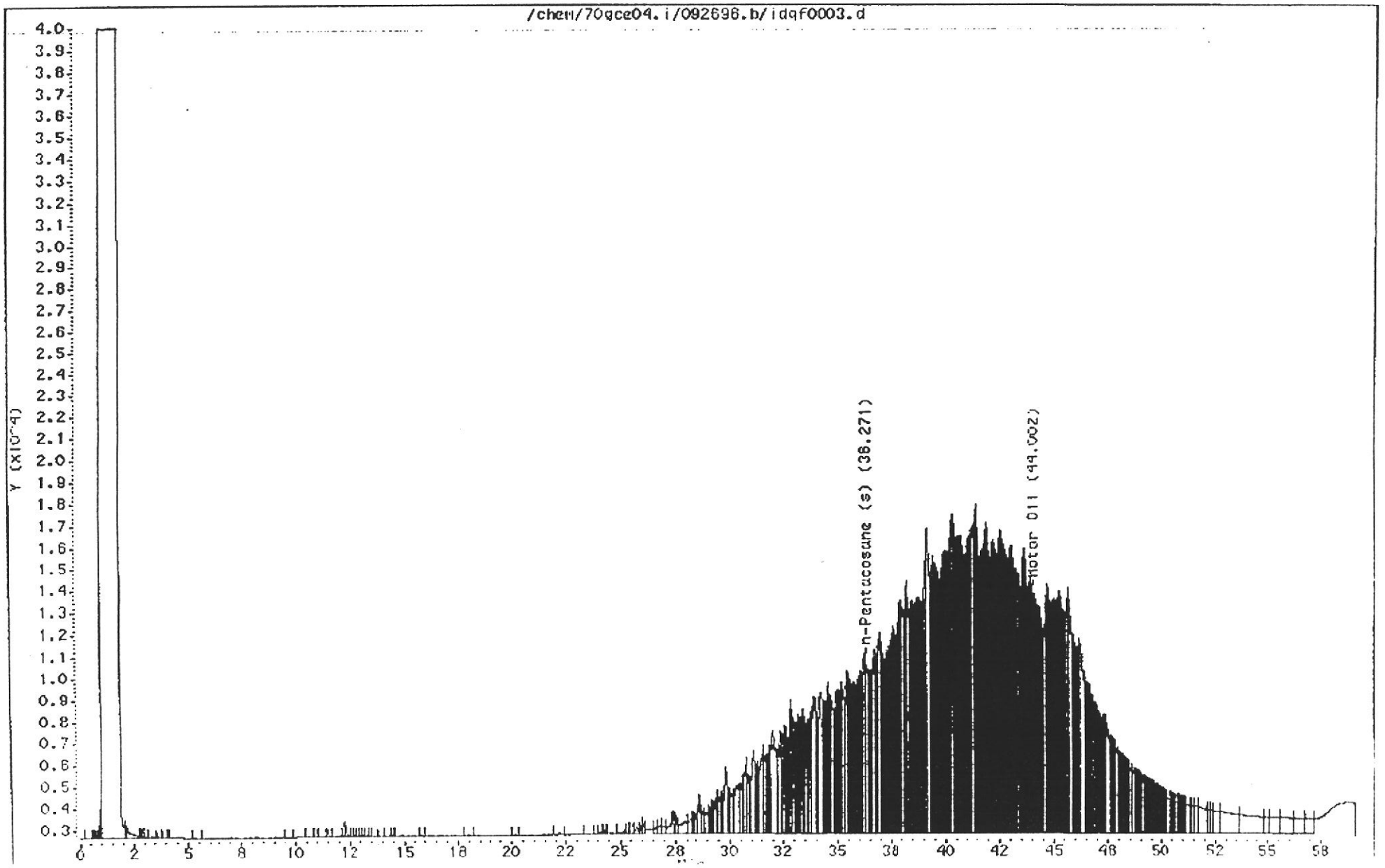
REPORT OF LABORATORY ANALYSIS

Data File: /chem/70gce04.i/092696.b/idqf0003.d
Date : 26-SEP-1996 14:01
Client ID:
Sample Info: CCAL Motor oil standard

Column phase: RESTEK XTI-5

Instrument: 70gce04.i

Operator: msn
Column diameter: 0.53

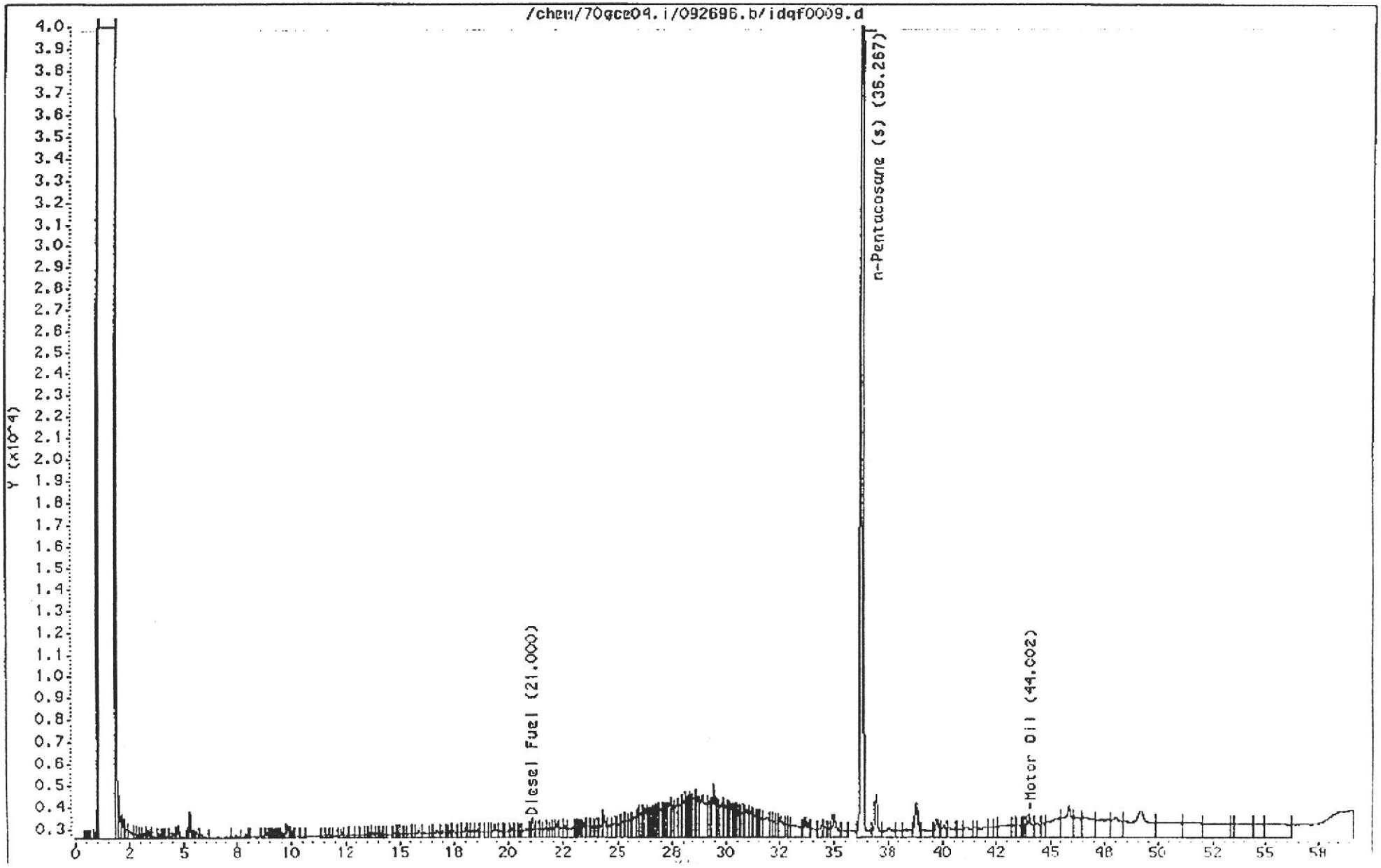


MW-SB2A

Data File: /chem/70gce04.i/092696.b/idqf0009.d
Date : 26-SEP-96 22:38
Client ID:
Sample Info: SAMPLE-water
Volume Injected (uL): 1.0
Column phase: RESTEK XTI-5

7073205 2

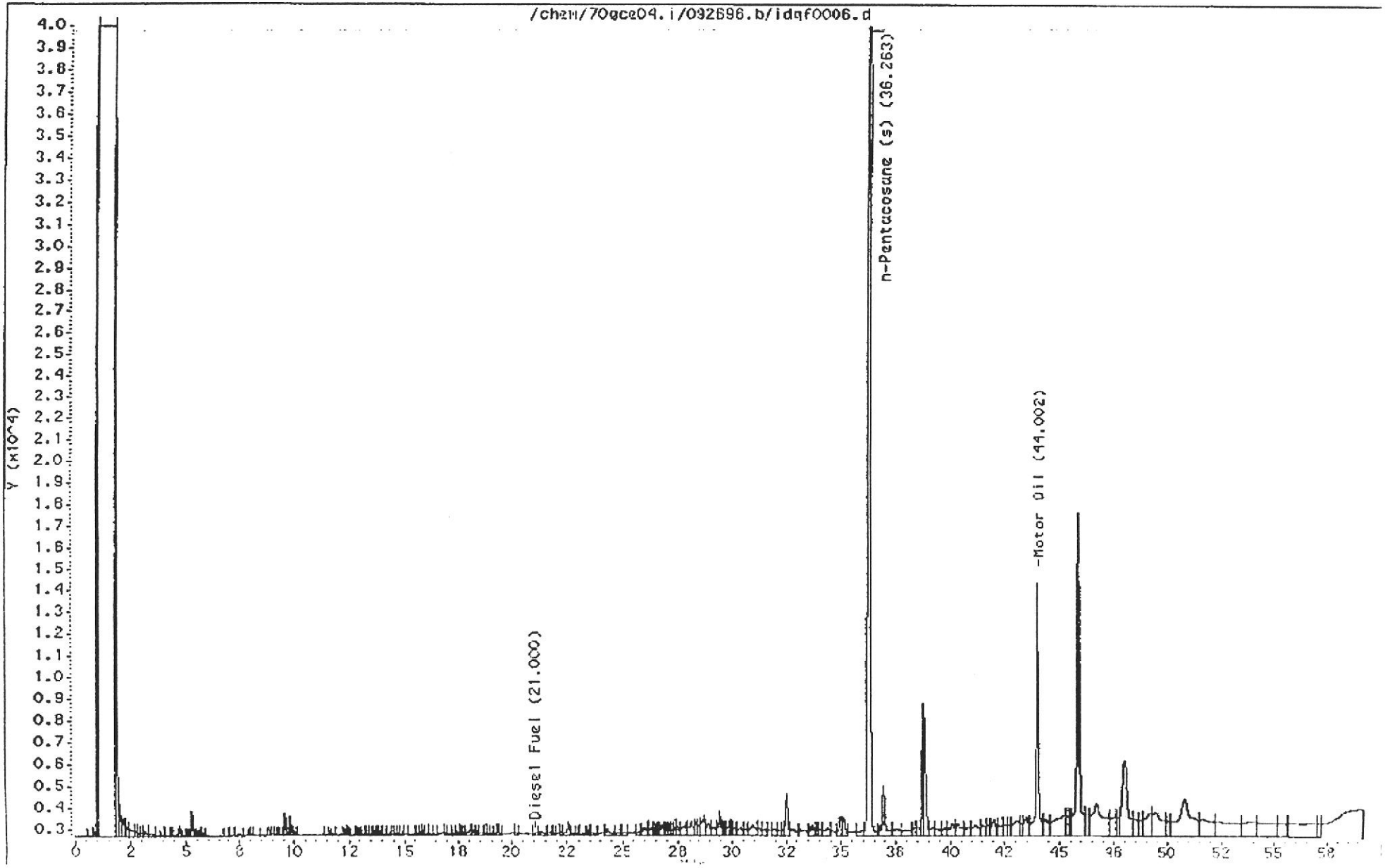
Instrument: 70gce04.i
Operator: wsn
Column diameter: 0.53



MW-SB3

Data File: /chem/70gce04.i/092696.b/idqf0008.d
Date : 26-SEP-1996 19:19
Client ID:
Sample Info: SAMPLE-water 70733029
Volume Injected (uL): 1.0
Column phase: RESTEK XTI-5

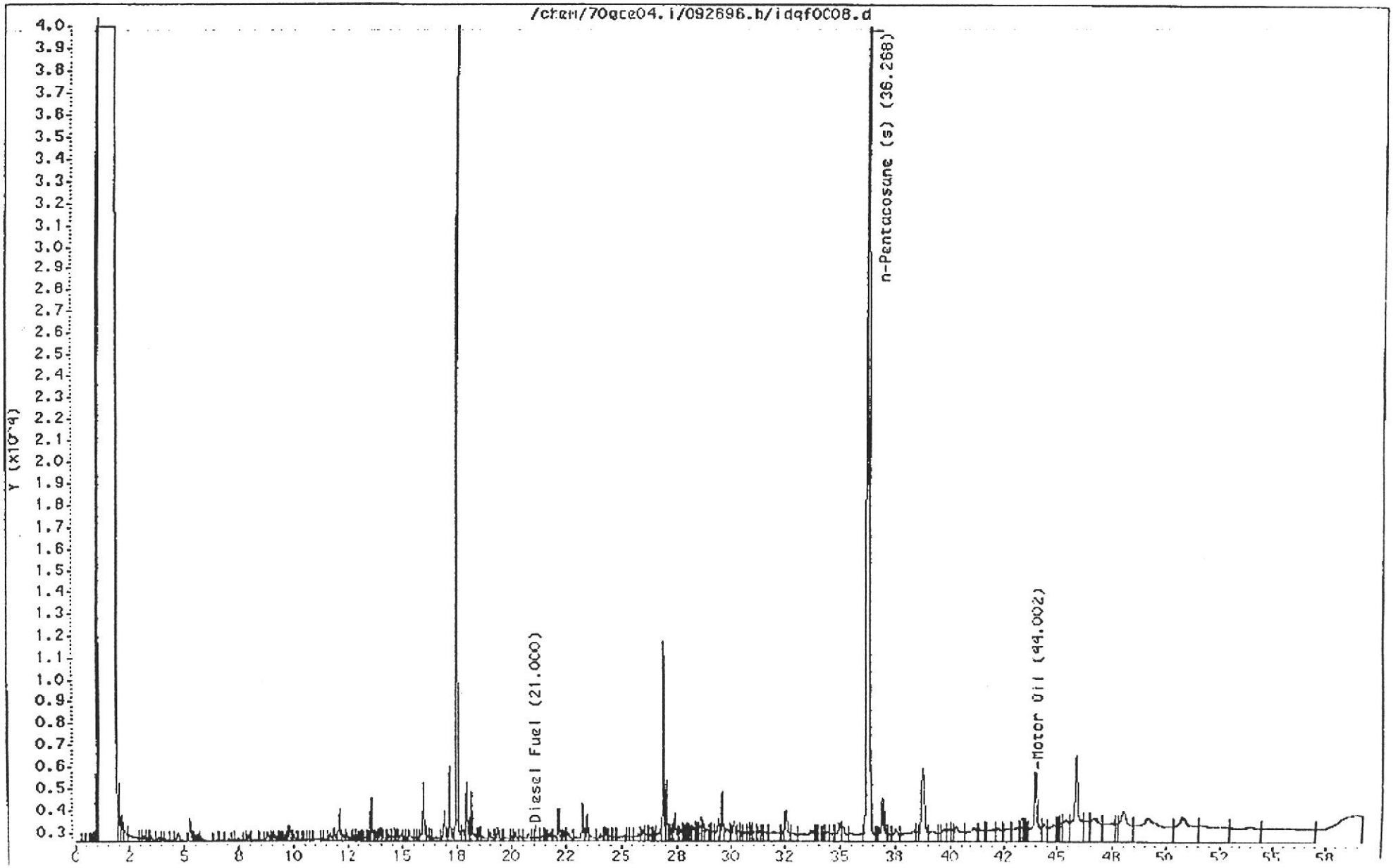
Instrument: 70gce04.i
Operator: msn
Column diameter: 0.53



MW-5B5

Data File: /chem/70gce04.i/092696.b/idqf0008.d
Date : 26-SEP-96 21:32
Client ID:
Sample Info: SAMPLE-Water 70732045
Volume Injected (uL): 1.0
Column phase: RESTEK XTI-5

Instrument: 70gce04.i
Operator: MSN
Column diameter: 0.53



Pace Analytical

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

October 01, 1996

Ms. Rhodora DelRosario
Baseline
5900 Hollis Street, Suite D
Emeryville, CA 94608

RE: PACE Project Number: 706592
Client Project ID: Port of Oakland-Biosite

Dear Ms. DelRosario:

Enclosed are the results of analyses for sample(s) received on September 16, 1996. Please note samples analyzed for TPH by EPA 8015 Modified were extracted with a silica gel cleanup procedure. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Stephanie Matzo

Stephanie Matzo
Project Manager

Enclosures

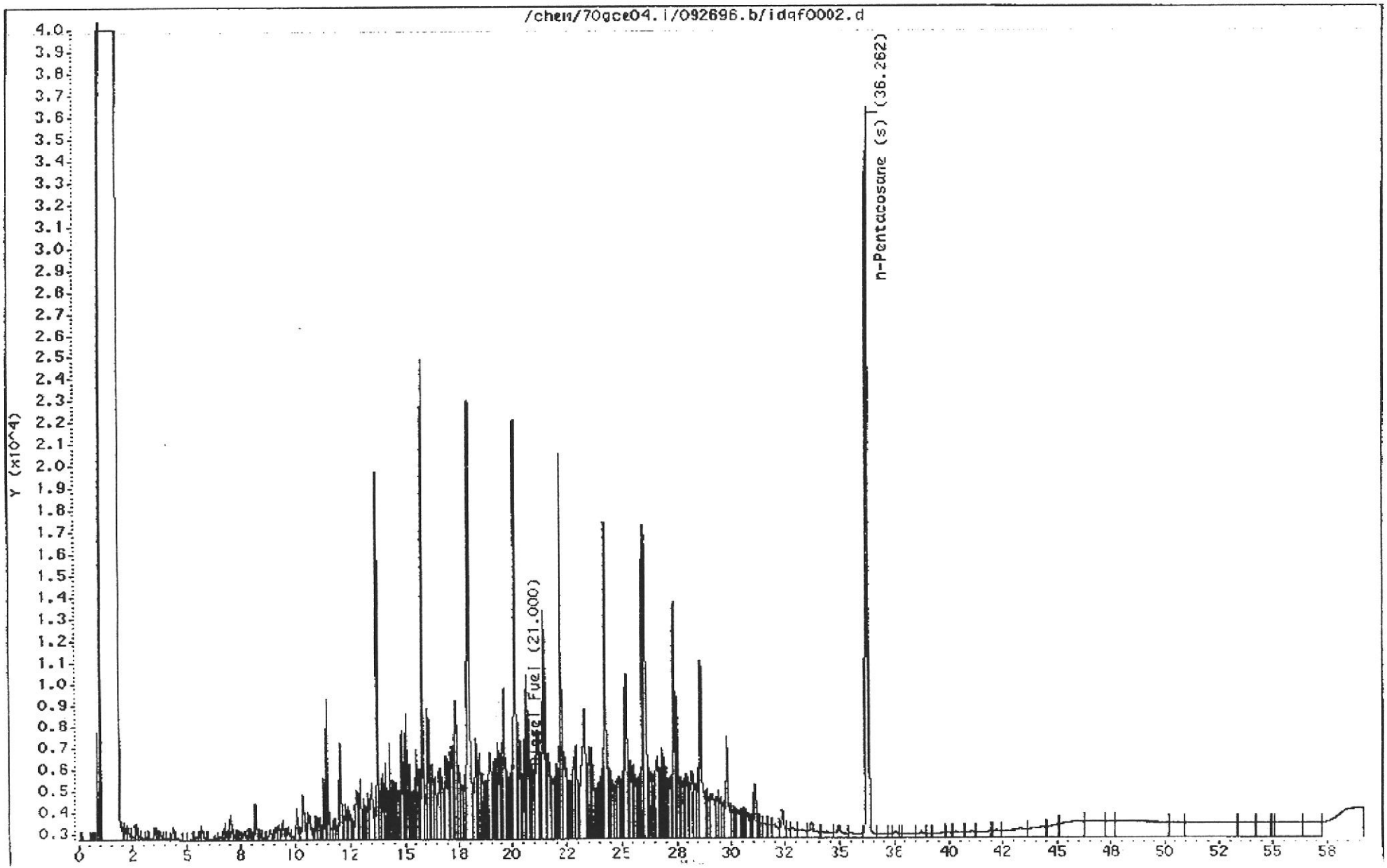
REPORT OF LABORATORY ANALYSIS

Data File: /chem/70gce04.i/092696.b/idqf0002.d
Date : 26-SEP-1996 12:58
Client ID:
Sample Info: CCAL diesel standard

Column phase: RESTEK XTI-5

Instrument: 70gce04.i

Operator: WSH
Column diameter: 0.53

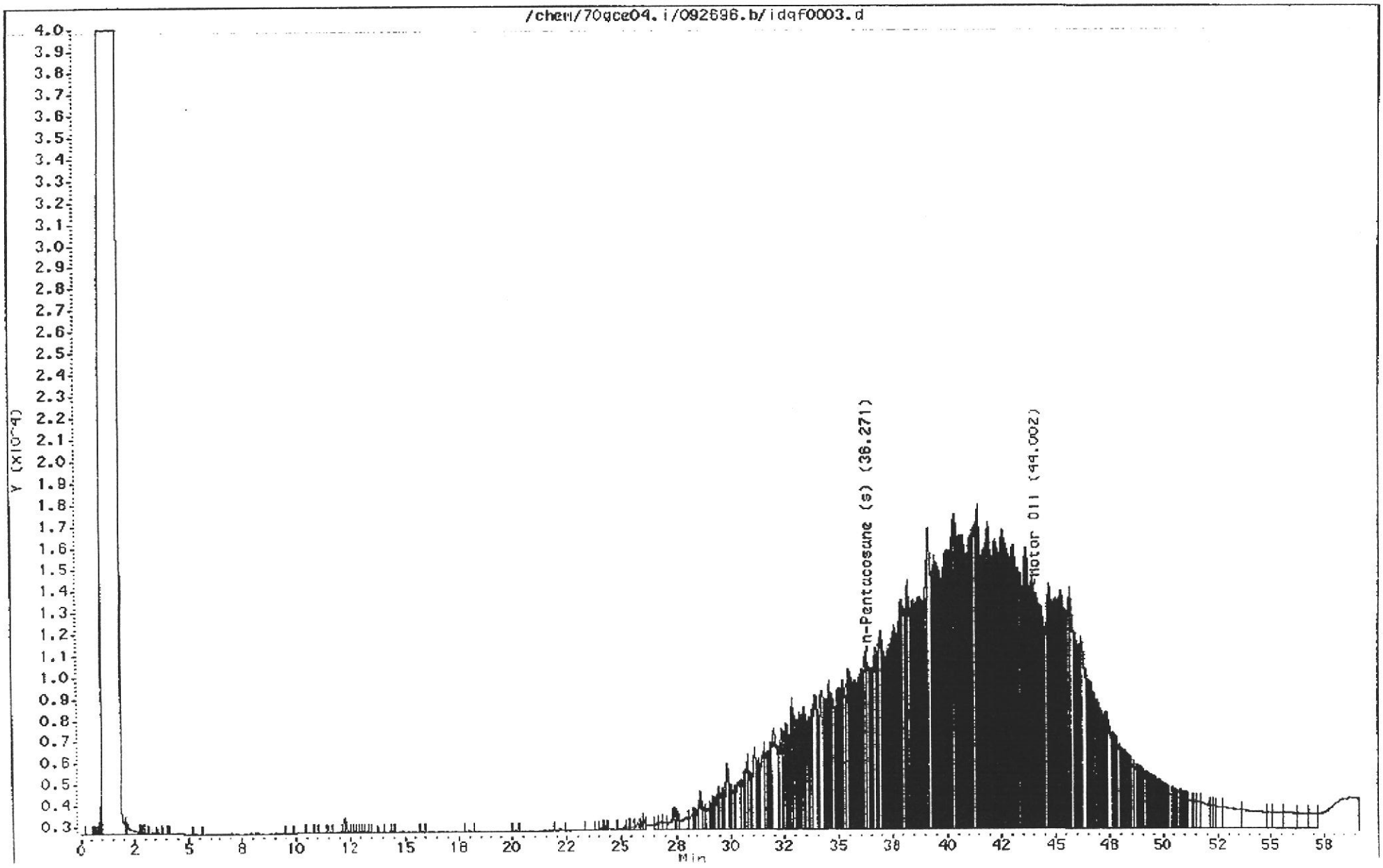


Data File: /chem/70gce04.i/092696.b/idqf0003.d
Date : 26-SEP-1996 14:01
Client ID:
Sample Info: CCAL Motor oil standard

Column phase: RESTEK XTI-5

Instrument: 70gce04.i

Operator: WSN
Column diameter: 0.53

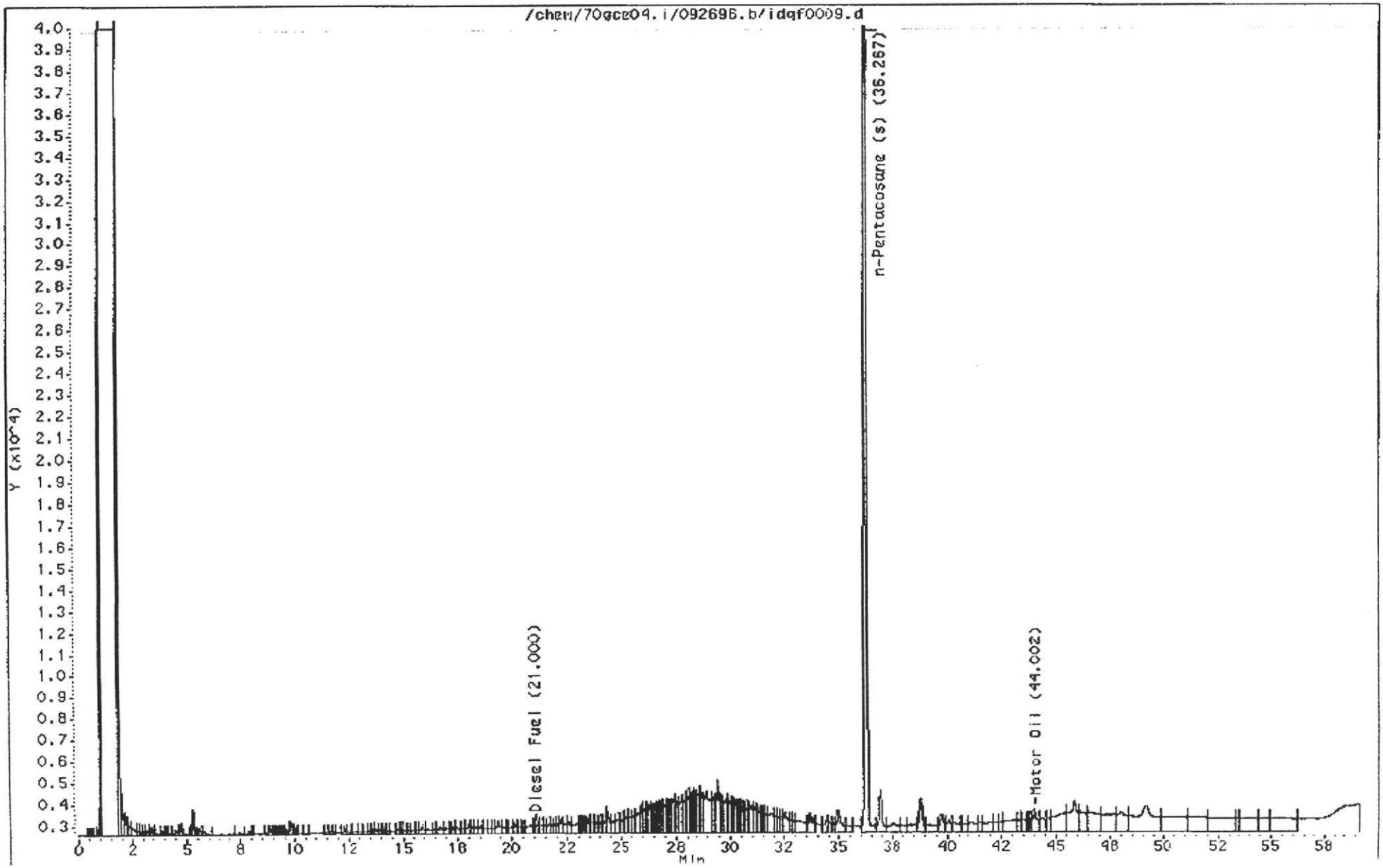


MW-SB2A

Data File: /chem/70gce04.i/092696.b/idqf0009.d
Date : 26-SEP-96 22:38
Client ID:
Sample Info: SAMPLE-water
Volume Injected (uL): 1.0
Column phase: RESTEK XTI-5

7073052

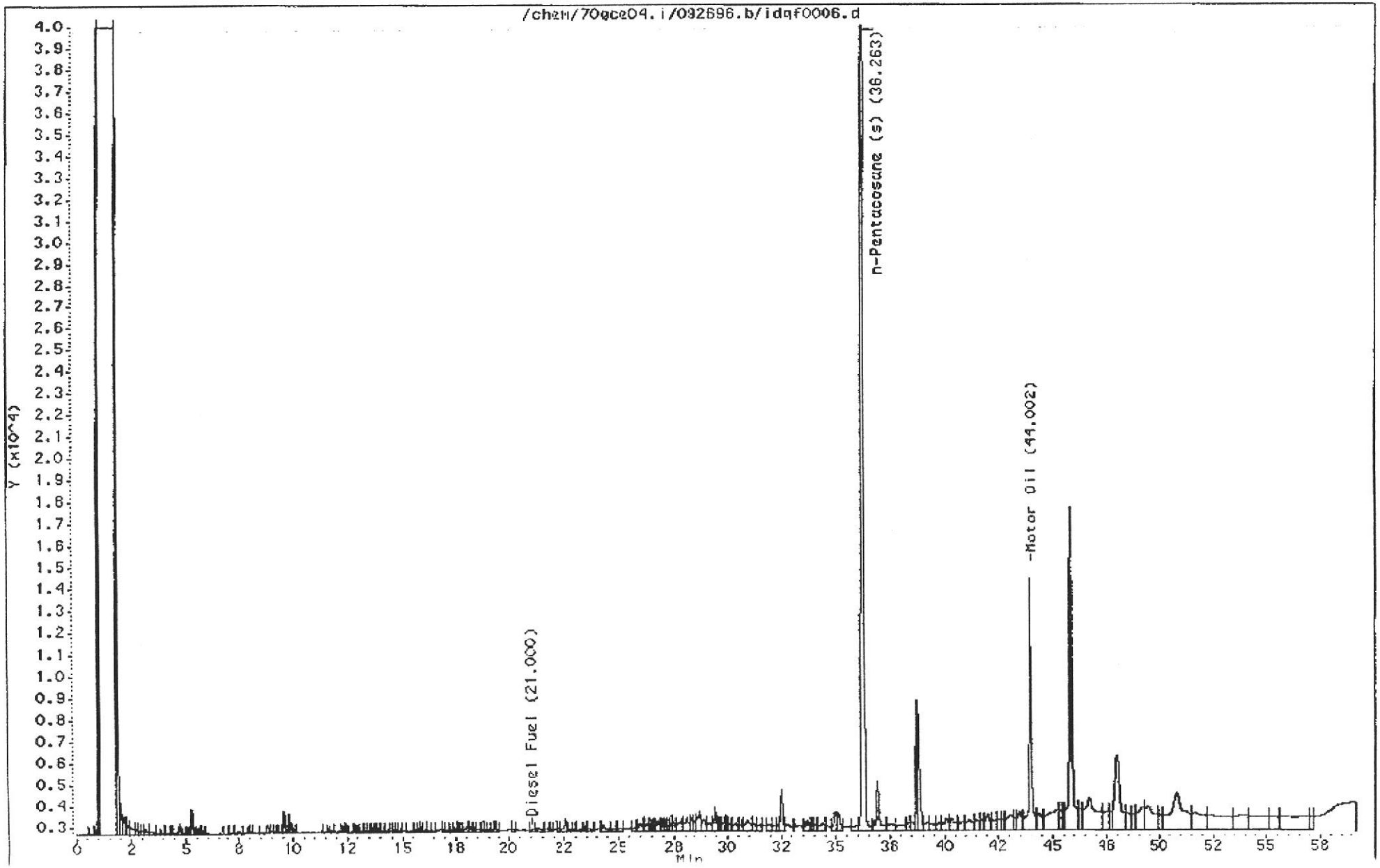
Instrument: 70gce04.i
Operator: wsn
Column diameter: 0.53



MW-SB3

Data File: /chem/70gce04.i/092696.b/idqf0006.d
Date : 26-SEP-1996 19:19
Client ID:
Sample Info: SAMPLE-water 70733029
Volume Injected (uL): 1.0
Column phase: RESTEK XTI-5

Instrument: 70gce04.i
Operator: wsn
Column diameter: 0.53



MW-5B5

Data File: /chem/70gce04.i/092696.b/idqf0008.d
Date : 26-SEP-96 21:32
Client ID:
Sample Info: SAMPLE-water
Volume Injected (uL): 1.0
Column phase: RESTEK XTI-5

70732045

Instrument: 70gce04.i

Operator: msn
Column diameter: 0.53