CLEARWATER
GROUP INC
Environmental Services

FILE

PRELIMINARY SOIL ASSESSMENT REPORT

626 Second Street
Oakland, California

Prepared for:

Museum of Children's Art
560 Second Street
Oakland, California 94607

Prepared by:

Clearwater Group, Inc.
520 Third Street, Suite 104
Oakland, California 94607
Clearwater Job No. C-154

October 18, 1996

CLEARWATER
GROUP INC
Environmental Services

TABLE OF CONTENTS

1.0 INTRODUCTION 1
1.1 Site Description 1
1.2 Purpose of Investigation 1

2.0 Methods 1
2.1 Soil Borehole Drilling and Soil Sampling 1
2.2 Soil Sample Analysis 2

3.0 RESULTS 3
3.1 Site Stratigraphy 3
3.2 Soil Sample Analytical Results 3

4.0 CONCLUSIONS AND RECOMMENDATIONS 4

5.0 CERTIFICATION 5

FIGURES
Figure 1: Site Location Map
Figure 2: Site Plan

TABLES
Table 1: Summary of Analytical Results

APPENDICES
Appendix A: Soil Boring Logs
Appendix B: Certified Laboratory Analytical Reports and Chain-of-Custody Forms

CLEARWATER
GROUP INC.
Environmental Services

1.0 INTRODUCTION

This report prepared by Clearwater Group, Inc. (Clearwater) presents the results of preliminary drilling and soil sampling activities conducted at 626 Second Street, Oakland, California (Figure 1).

1.1 Site Description

The site is located on the north side of Second Street, between Martin Luther King Jr. Boulevard and Jefferson Street (Figure 1). A vacant building currently occupies the site. Two underground storage tanks (USTs) are located beneath the sidewalk approximately five feet from the building, and are currently inactive. Clearwater understands the USTs have been inactive for over 60 years, but their exact age and past contents are unknown. However, based on approximate UST size and dispensing lines, Clearwater surmises the past contents were some type of petroleum fuel. During site reconnaissance prior to drilling, the western UST was inspected by removing the cap and extending a measuring tape into fill pipe. The depth to the bottom of the UST was approximately 9.5 feet below grade, and there appeared to be approximately 0.5 feet of liquid at the bottom.

Adjacent property use ranges from light industrial and commercial to a power station. Pacific Gas and Electric operates an electric sub-station on the south side of Second Street. The nearest body of surface water, the Oakland Inner Harbor, is located approximately 700 feet south of the site.

1.2 Purpose of Investigation

The purpose of this investigation was to determine if the subsurface proximal to the USTs had been impacted by possible past releases from the USTs. This work was performed in accordance with Clearwater's proposal to the Museum of Children's Art dated August 6, 1996.

2.0 METHODS

2.1 Soil Borehole Drilling and Soil Sampling

Soil boring locations were selected based on the reported size and orientation of the USTs and locations of overhead and subsurface utilities. Locations of the three soil borings (SB-1, SB-2, and SB-3) are shown on Figure 2.

Drilling was performed by Soil Exploration Services, Inc. using a CME 55 drill rig equipped with four-inch diameter cutting-less hollow-stem augers. Each soil boring was hand excavated to a depth of 4.5 feet below grade to ensure the drilling location was free of underground structures. During drilling, soil samples were collected using a 1.5-inch diameter split-spoon sampler lined with brass tubes. Soil samples identified for laboratory analysis were covered with teflon lined plastic end caps,

labeled, documented on a chain-of-custody form, and placed on ice in a cooler for transport to the project laboratory.

During drilling of SB-1, soils encountered to a depth of 4.5-feet below grade were observed to be stained dark gray and exhibited a petroleum hydrocarbon odor. Upon driving the first sampler starting at a depth of 4.5 feet below grade, an unidentified subsurface structure was pierced at a depth of 5 feet below grade after approximately two blows with the 40 pound automatic hammer. The sampler then fell under its own weight and was withdrawn immediately. Upon retrieval, the entire sampler (two feet in length) was saturated with an unknown liquid, but exhibited the same petroleum hydrocarbon odor as noted in the soil above. The liquid appeared to consist primarily of water and no sheen was noted. Boring SB-1 was backfilled immediately with hydrated bentonite. It remains unclear if this subsurface structure was the actual UST because of differences between the depths at which liquids were present and thicknesses measured (e.g. approximately 2 feet of liquid encountered at 5 feet below grade in SB-1 compared to approximately 0.5 feet of liquid present at 9 feet in UST).

In an effort to further characterize the observed soil discoloration, boring SB-3 was located several feet from SB-1 (Figure 2). The same soil discoloration and petroleum hydrocarbon odor were observed in this boring as in SB-1. A soil sample was collected from this boring at a depth interval of 1.5 to 2 feet below grade. SB-3 was also backfilled with hydrated bentonite.

Boring SB-2 was advanced to a total depth of 20 feet below grade, and the soil sample collected at a depth of 6 feet below grade was submitted for laboratory analysis. Clearwater attempted to collect a grab groundwater sample from SB-2; however, no free standing water entered the borehole due to heaving saturated sands. Thus, collection of a water sample was impossible without the use of a hydropunch tool or actual installation of a well.

Portions of soil samples were retained for visual inspection and classification according to the Unified Soil Classification System by a Clearwater geologist (Borings logs are included in Appendix A).

2.1 Soil Sample Analysis

The soil sample collected from SB-3 was analyzed a for a "fuel fingerprint" and for total petroleum hydrocarbons as gasoline (TPHg), benzene, toluene, ethylbenzene, xylene isomers (BTEX), and methyl tertiary-butyl ether (MTBE) according to EPA methods 8015/8020 (modified). The fuel fingerprint analysis was performed on this sample to identify the specific contaminant type present (i.e. weathered gasoline, mineral spirits, diesel, kerosene, etc.). The soil sample from SB-3 was chosen for this analysis because it appeared to the most contaminated sample collected during

the investigation, based on observed dark gray discoloration and petroleum hydrocarbon odor. The laboratory was instructed to analyze the sample from SB-2 for any fuel types identified by the fuel fingerprint analysis on SB-3. Sample analysis was performed by American Environmental Network, a state DHS-certified laboratory located in Pleasant Hill, California.

3.0 RESULTS

3.1 Site Stratigraphy

The site is underlain by relatively coarse-grained deposits, ranging mostly from silty sands to sands to a depth of 20 feet below grade (the maximum depth explored).

During drilling, first encountered groundwater was observed at a depth of approximately 8.5 feet below grade in SB-2. A stabilized depth to groundwater could not be obtained due to heaving saturated sands. However, based on site stratigraphy, it is assumed groundwater occurs in unconfined conditions, and that phreatic groundwater surface is present at a depth of approximately 8.5 feet below grade. Soil borings logs are included in Appendix A.

3.2 Soil Sample Analytical Results

Results of the fuel fingerprint analysis on soil sample SB-3-1.5' indicate the presence of two distinct types of petroleum hydrocarbons in the sample. The chromatogram pattern for the first type (hydrocarbon range from <C4 to C12) was identified as extremely weathered gasoline or possibly mineral spirits. The chromatogram pattern for the second type (hydrocarbon range from C16 to C44+) was identified as asphalt. The presence of asphalt in the sample is not surprising considering the shallow depth of soil sample collection (i.e. asphalt chips probably fell into the borehole from the sidewalk surface), and it is not regarded as subsurface contamination resulting from the USTs. However, the presence of extremely weathered gasoline or possibly mineral spirits likely resulted from the use of the UST system.

The concentration for gasoline, as analyzed by the fuel fingerprint analysis, was quantified at 90 milligrams per kilogram (mg/kg). However, the results for the routine TPHg and BTEX analysis indicated the presence of gasoline in lower concentrations in the same sample. TPHg by EPA Method 8015 was reported at a concentration of 2.9 mg/kg. Ethylbenzene and xylene isomers were the only aromatic hydrocarbons detected in this sample, at concentrations of 0.45 and 0.065 mg/kg, respectively. The discrepancy between TPHg concentrations of 90 and 2.9 mg/kg in the same sample probably resulted from sample heterogeneity, as the laboratory must use different portions of soil sample for individual analyses.

Soil sample SB-2-6' was free of detectable concentrations of TPHg and BTEX, save xylene isomers at a concentration of 0.005 mg/kg. Although xylenes were the only gasoline hydrocarbons detected in concentrations exceeding the reporting limit, the laboratory noted the presence of extremely weathered gasoline or possibly mineral spirits in this sample also. The results of soil sample analyses are summarized on Table 1. Copies of the laboratory report and chain-of-custody form are included in Appendix B.

4.0 CONCLUSIONS AND RECOMMENDATIONS

The site is underlain by silty sands to sands and groundwater is present in unconfined conditions at an approximate depth of 8.5 feet below grade.

Results of initial soil sampling and analyses indicate the presence of gasoline in subsurface soils proximal to the western UST. The most contaminated sample, SB-3-1.5', was collected from a depth presumably above the UST. This suggests that a release from the UST may have occurred from either overfilling and/or failure of the UST wall integrity or piping. Considering the relatively permeable soil type, it is possible more significant contaminant concentrations are present in soil and groundwater below the UST. However, the lateral limit of vadose contamination to the west of the UST does not appear to extend significantly beyond the location of SB-2.

Clearwater recommends closure of the USTs and associated piping since they have been out of service for many years and no future use is planned. Considering the fact that gasoline hydrocarbons have been detected in soil proximal to the USTs, it is likely closure by removal (in lieu of closure in-situ) will be required by the local regulatory agency.

CLEARWATER
GROUP, INC.
Environmental Services

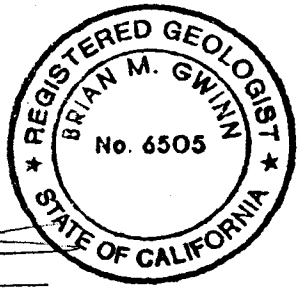
5.0 CERTIFICATION

This report was prepared under the supervision of a professional registered geologist at Clearwater Group, Inc. All statements, conclusions and recommendations are based solely upon field observations by Clearwater Group, Inc. and analyses performed by a state-certified laboratory related to the work performed by Clearwater Group, Inc. Clearwater Group, Inc. is not responsible for laboratory errors.

The service performed by Clearwater Group, Inc. has been conducted in a manner consistent with the level of care and skill ordinarily exercised by members of our profession currently practicing under similar conditions in the area of the site. No other warranty, expressed or implied, is made.

CLEARWATER GROUP, INC.

Prepared by:

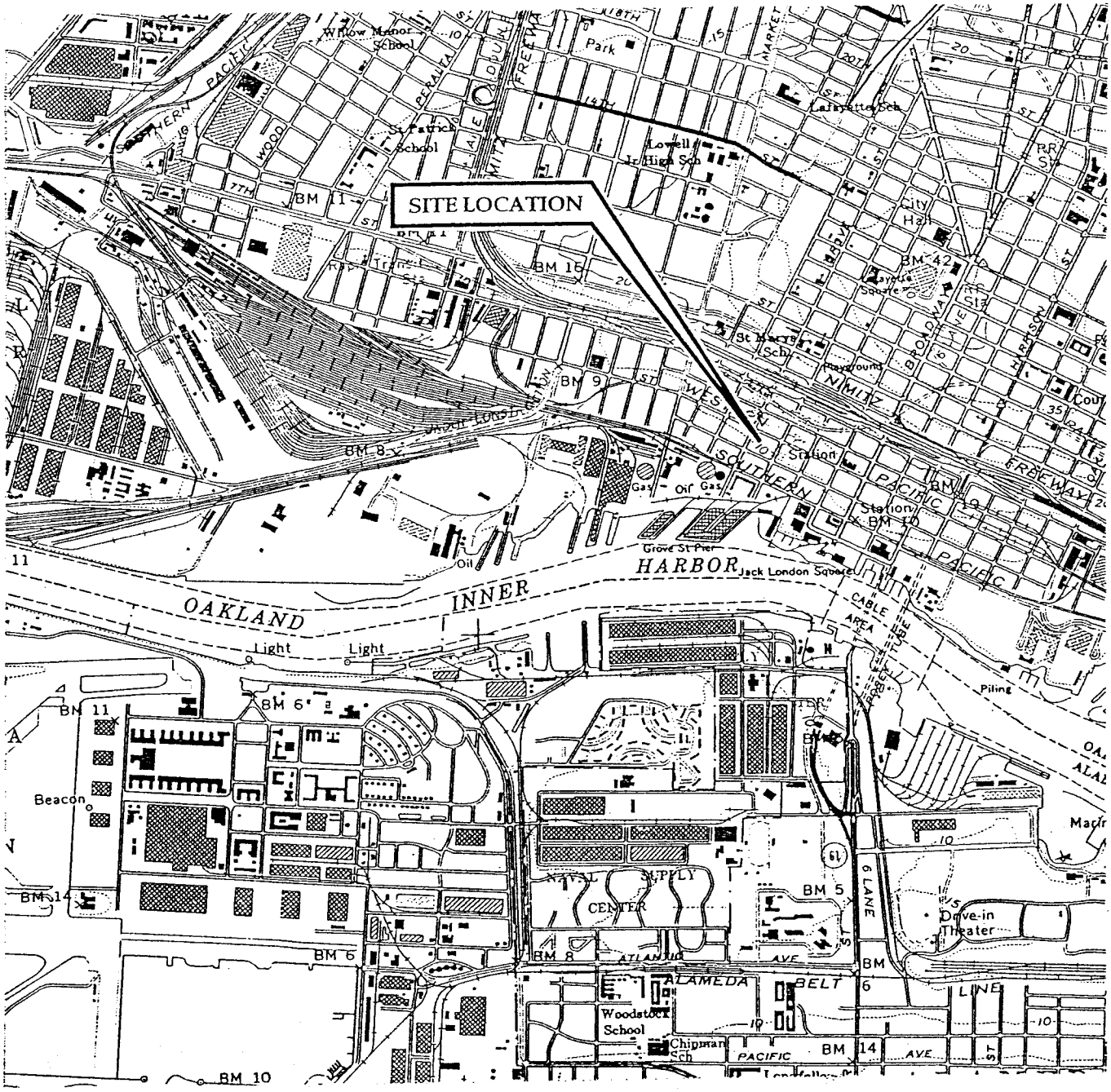


Brian Gwinn, R.G.
Project Geologist

Reviewed by:

Markus Niebanck, R.G.
Senior Geologist

FIGURES



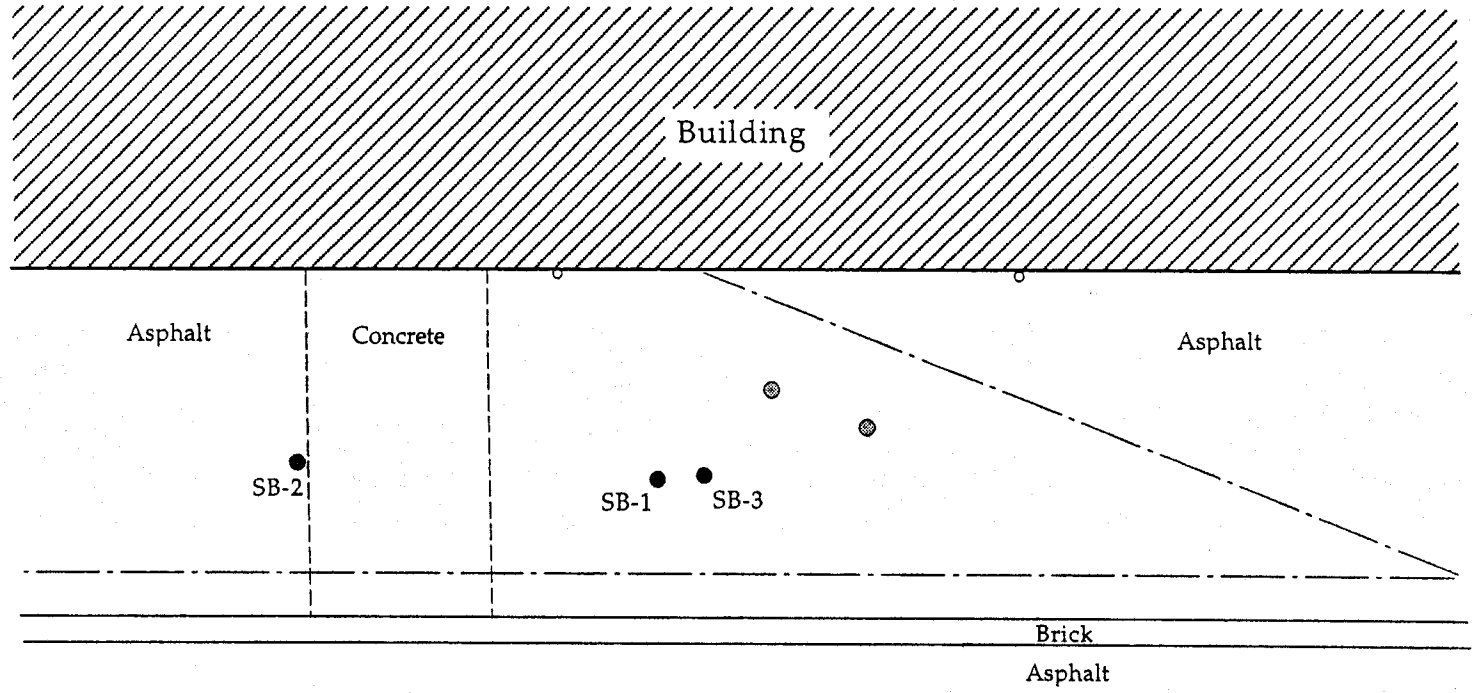
Source:
USGS 7.5' topographic series
entitled "Oakland West, CA"

SITE LOCATION MAP

625 Third Street
Oakland, California

CLEARWATER GROUP, INC.

Project No.	Date	Figure
C-154	9/96	1



EXPLANATION

SB-2 ● = Soil Boring

◎ = Underground Storage Tank Fill Cap

○ = Underground Storage Tank Vent Stub

= Overhead Utility Line

0 10 20

APPROXIMATE SCALE IN FEET

N

SITE PLAN

626 Second Street
Oakland, California

CLEARWATER GROUP, INC.

Project No.	Report Date	Figure
C-154	9/96	2

TABLES

Table 1
SUMMARY OF ANALYTICAL RESULTS

626 Second Street
Oakland, California

Sample No.	Date	TPHg (1) (mg/kg)	TPHg (2) (mg/kg)	B (mg/kg)	T (mg/kg)	E (mg/kg)	X (mg/kg)
SB-3-1.5'	9/13/96	90*	2.9	<0.005	<0.005	0.045	0.065
S-2-6'	9/13/96	—	<2	<0.005	<0.005	<0.005	0.005

Notes:

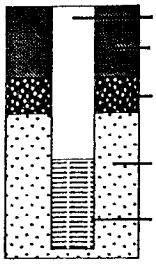
Sample No.:	Sample designation and collection depth in feet
Date:	Sample collection date
TPHg (1):	Total petroleum hydrocarbons as gasoline quantified from fuel fingerprint (<C7 to C12)
TPHg (2):	Total petroleum hydrocarbons as gasoline using EPA Method 8015 (modified)
BTEX, MTBE:	Benzene, Toluene, Ethylbenzene, total Xylenes, and Methyl Tert-Butyl Ether using EPA Method 8020 (modified)
mg/kg:	milligrams per kilogram (often referred to as "parts per million")
*:	Chromatogram pattern interpreted as extremely weathered gasoline or possibly mineral spirits
<### :	Not detected in exceeding indicated concentrations
—:	Not analyzed

APPENDIX A

UNIFIED SOIL CLASSIFICATION SYSTEM - VISUAL CLASSIFICATION OF SOILS
(ASTM D-2488)

MAJOR DIVISIONS		GROUP SYMBOL	GROUP NAME	DESCRIPTION
COARSE GRAINED SOILS	GRAVEL AND GRAVELLY SOILS	GW	Well-graded gravel Well-graded gravel with sand	Well-graded gravels or gravel-sand mixtures, little or no fines.
		GP	Poorly-graded gravel Poorly-graded gravel with sand	Poorly-graded gravels or gravel sand mixture, little or no fines.
		GM	Silty gravel Silty gravel with sand	Silty gravels, gravel-sand-silt mixtures.
		GC	Clayey gravel Clayey gravel with sand	Clayey gravels, gravel-sand-clay mixtures.
	SAND AND SANDY SOILS	SW	Well-graded sand Well-graded sand with gravel	Well-graded sands or gravelly sands, little or no fines.
		SP	Poorly-graded sand Poorly-graded sand with gravel	Poorly-graded sands or gravelly sands, little or no fines.
		SM	Silty sand Silty sand with gravel	Silty sands, sand-silt mixtures.
		SC	Clayey sand Clayey sand with gravel	Clayey sands, sand-clay mixtures.
FINE GRAINED SOILS	SILTS AND CLAYS	ML	Silt; Silt with sand; Silt with gravel Sandy silt; Sandy silt with gravel Gravelly silt; Gravelly silt with sand	Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity.
		CL	Lean clay; Lean clay with sand; Lean clay with gravel Sandy lean clay; Sandy lean clay with gravel Gravelly lean clay; Gravelly lean clay with sand	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays.
	ELASTIC SILTS AND CLAYS	MH	Elastic silt; Elastic silt with sand; Elastic silt with grave Sandy elastic silt; Sandy elastic silt with gravel Gravelly elastic silt; Gravelly elastic silt with sand	Inorganic silts, micaceous or diatamaceous fine sandy or silty soils, elastic silts.
		CH	Fat clay; Fat clay with sand; Fat clay with gravel Sandy fat clay; Sandy fat clay with gravel Gravelly fat clay; Gravelly fat clay with sand	Inorganic clays of high plasticity, fat clays.
HIGHLY ORGANIC SOILS		OL/OH	Organic soil; Organic soil with sand; Organic soil with gravel Sandy organic soil; Sandy organic soil with gravel Gravelly organic soil; Gravelly organic soil with sand	Organic silts and organic silt-clays of low plasticity. Organic clays of medium to high plasticity.
		Pt	Peat	Peat and other highly organic soils.

WELL CONSTRUCTION EXPLANTION



SOIL BORING NOTES:

Blow count represents the number of blows of a 140-lb hammer falling 30 inches per blow required to drive a sampler through the last 12 inches of an 18-inch penetration.

No warranty is provided as to the continuity of soil strata between borings. Logs represent the soil section observed at the boring location on the date of drilling only.

S = Sampler sank into medium under the weight of the hammer (no blow count)
P = Sampler was pushed into medium by drilling rig (no blow count)
NR = No Recovery

SANDS & GRAVELS	BLOWS/FT
VERY LOOSE	0 - 5
LOOSE	5 - 12
MED. DENSE	12 - 37
DENSE	37 - 62
VERY DENSE	OVER 62

SILTS & CLAYS	BLOWS/FT
SOFT	0 - 5
FIRM	5 - 10
STIFF	10 - 20
VERY STIFF	20 - 40
HARD	OVER 40

▼ Approximate stabilized water level

▽ Approximate first encountered water level

NOTE: all percentages of lithological composition presented on the soil boring logs are approximate. They represent the best estimates of a CGI geologist based on visual inspection in the field.

CLEARWATER Group, Inc.

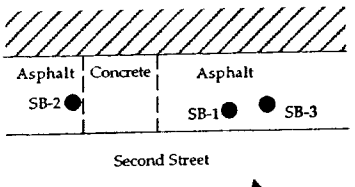
SOIL BORING LOG AND WELL CONSTRUCTION DIAGRAM LEGEND

CLEARWATER GROUP, INC.

FIELD EXPLORATORY SOIL BORING LOG: SB-1

Sheet 1 of 1

FIELD LOCATION OF BORING:



CLIENT/LOCATION:	BORING NO.:	BORING DEPTH:	BORING DIAMETER:
MOCHA/626 2nd,Oakland	SB-2	5 feet	4 Inches
DRILLING CONTRACTOR:	**WELL NO.:**	**WELL DEPTH:**	**PLANNED USE:**
SES, Inc.	NA	NA	NA
DRILL RIG TYPE:	**WELL MATERIAL:**	**SCREEN SLOT SIZE:**	**FILTER PACK:**
CME 55	NA	NA	NA
DRILL RIG OPERATOR:	**WELL SEAL:**		
Kevin Cross	Hydrated bentonite		

SAMPLING METHOD: 1.5" O.D. split-spoon sampler

MONITORING INSTRUMENT: Sensidyne FID (malfunctioned)

FIRST ENCOUNTERED WATER DEPTH: NA

STATIC WATER DEPTH - DATE: NA

DRILLING/WELL CONSTRUCTION: START 9/13/96 FINISH 9/13/96

LOGGED BY: Brian Gwinn, R.G.

APPROVED BY:

WELL CONSTRUCTION DETAIL	SAMPLING: BLOWS/6" INTERVAL	SAMPLING: INTERVAL	SAMPLING: RECOVERY	SAMPLING: ANALYTICAL	WATER LEVEL	DEPTH (FEET)	OVM READING (PPM)	ESTIMATED PERCENT: GRAVEL	ESTIMATED PERCENT: SAND	ESTIMATED PERCENT: FINES	GRAPHIC LOG
NO WELL INSTALLED (SEALED WITH BENTONITE)						1	No OVM readings - FID malfunctioning in field				
						2		0	85	15	
						3					
						4					
						5					??Underground structure??
						6					
						7					
						8					
						9					
						10					
						11					
						12					
						13					
						14					
						15					
						16					
						17					
						18					
						19					
						20					

Asphalt and baserock

Silty SAND (SM); stained dark gray; poorly graded; sub-angular to sub-rounded, very fine to medium sand; trace cobbles; loose; dry; petroleum hydrocarbon odor (turpentine-like).

After approximately two blows with 40 lbs. hammer, sampler sank into void under its own weight. Upon retrieval, sampler soaked in liquid which appeared to be mostly water; however, similar petroleum hydrocarbon odor as in soil noted in liquid. No sheen present.

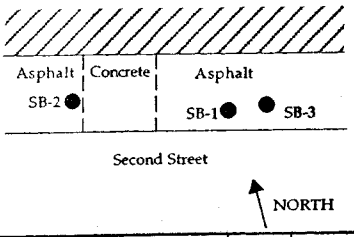
Borehole filled with hydrated bentonite.

CLEARWATER GROUP, INC.

FIELD EXPLORATORY SOIL BORING LOG: SB-2

Sheet 1 of 1

FIELD LOCATION OF BORING:



CLIENT/LOCATION:	BORING NO.:	BORING DEPTH:	BORING DIAMETER:
MOCHA/626 2nd,Oakland	SB-2	20 feet	4 Inches
DRILLING CONTRACTOR:	**WELL NO.:**	**WELL DEPTH:**	**PLANNED USE:**
SES, Inc.	NA	NA	NA
DRILL RIG TYPE:	**WELL MATERIAL:**	**SCREEN SLOT SIZE:**	**FILTER PACK:**
CME 55	NA	NA	NA
DRILL RIG OPERATOR:	**WELL SEAL:**		
Kevin Cross	Cement		

SAMPLING METHOD: 1.5" O.D. split-spoon sampler

MONITORING INSTRUMENT: Sensidyne FID (malfunctioned)

FIRST ENCOUNTERED WATER DEPTH: Wet sample at ~8.5 feet

STATIC WATER DEPTH - DATE: Heaving sands, no free water

LOGGING/WELL CONSTRUCTION: START 9/13/96 FINISH 9/13/96

LOGGED BY: Brian Gwinn, R.G.

APPROVED BY:

WELL CONSTRUCTION DETAIL	SAMPLING: BLOWS/6" INTERVAL	SAMPLING: INTERVAL	SAMPLING: RECOVERY	SAMPLING: ANALYTICAL	WATER LEVEL	DEPTH (FEET)	OVM READING (PPM)	ESTIMATED PERCENT: GRAVEL	ESTIMATED PERCENT: SAND	ESTIMATED PERCENT: FINES	GRAPHIC LOG
NO WELL INSTALLED					▽	1	No OVM readings - FID malfunctioning in field				
						2		0	80	20	
						3					
	P					4					
	P										
	P					5		0	85	15	
	P										
	P					6					
	P										
	P					7					
	P							0	90	10	
						8					
						9					
						10					
						11					
						12					
						13					
	P										
	P					14		0	75	25	
	P										
	P					15					
						16					
						17					
						18					
						19					
						20					

Asphalt and baserock

Silty SAND (SM); yellow-brown; poorly graded; sub-angular to sub-rounded, very fine to medium sand; trace cobbles; loose; dry.

Silty SAND (SM); dark brown; poorly graded; sub-angular to sub-rounded, very fine to medium sand; trace cobbles; loose; damp.

SAND (SP); blue-gray; poorly graded; sub-rounded, fine to medium sand; loose; wet.

Silty SAND (SM); blue-gray with orange mottles; poorly graded; sub-rounded, fine to medium sand; loose; saturated.

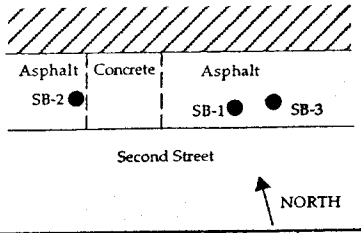
Note:
No water entered borehole due to heaving sands

CLEARWATER GROUP, INC.

FIELD EXPLORATORY SOIL BORING LOG: SB-3

Sheet 1 of 1

FIELD LOCATION OF BORING:



CLIENT/LOCATION:	BORING NO.:	BORING DEPTH:	BORING DIAMETER:
MOCHA/626 2nd,Oakland	SB-3	2 feet	4 Inches
DRILLING CONTRACTOR:	**WELL NO.:**	**WELL DEPTH:**	**PLANNED USE:**
SES, Inc.	NA	NA	NA
DRILL RIG TYPE:	**WELL MATERIAL:**	**SCREEN SLOT SIZE:**	**FILTER PACK:**
CME 55	NA	NA	NA
DRILL RIG OPERATOR:	**WELL SEAL:**		
Kevin Cross	Hydrated bentonite		

SAMPLING METHOD: 1.5" O.D. split-spoon sampler

MONITORING INSTRUMENT: Sensidyne FID (malfunctioned)

FIRST ENCOUNTERED WATER DEPTH: NA

STATIC WATER DEPTH - DATE: NA

LOGGING/WELL CONSTRUCTION: START 9/13/96 FINISH 9/13/96

LOGGED BY: Brian Gwinn, R.G.

APPROVED:

WELL CONSTRUCTION DETAIL	SAMPLING: BLOWS/6" INTERVAL	SAMPLING: INTERVAL	SAMPLING: RECOVERY	SAMPLING: ANALYTICAL	WATER LEVEL	DEPTH (FEET)	OVM READING (PPM)	ESTIMATED PERCENT: GRAVEL	ESTIMATED PERCENT: SAND	ESTIMATED PERCENT: FINES	GRAPHIC LOG
NO WELL INSTALLED (SEALED WITH BENTONITE)						1	No OVM readings - FID malfunctioning in field	0	85	15	
						2					
						3					
						4					
						5					
						6					
						7					
						8					
						9					
						10					
						11					
						12					
						13					
						14					
						15					
						16					
						17					
						18					
						19					
						20					

Asphalt and baserock

Silty SAND (SM); stained dark gray; poorly graded; sub-angular to sub-rounded, very fine to medium sand; trace cobbles; loose; dry; petroleum hydrocarbon odor (turpentine-like).

APPENDIX B

American Environmental Network

Certificate of Analysis

DOHS Certification: 1172

AIHA Accreditation: 11134

RECEIVED OCT 0 3 1996

CLEARWATER GROUP, INC.
520 THIRD ST., STE. 104
OAKLAND, CA 94607

REPORT DATE: 10/02/96

DATE(S) SAMPLED: 09/13/96

DATE RECEIVED: 09/13/96

AEN WORK ORDER: 9609165

ATTN: BRIAN GWINN
CLIENT PROJ. ID: C-154

P.O. NUMBER: MOCHA

PROJECT SUMMARY:

On September 13, 1996, this laboratory received 3 soil sample(s).

Client requested 2 sample(s) be analyzed for chemical parameters; one sample was placed on hold. Results of analysis are summarized on the following page(s). Petroleum product screen results are included as an attachment. Please see quality control report for a summary of QC data pertaining to this project.

Samples will be stored for 30 days after completion of analysis, then disposed of in accordance with State and Federal regulations. Samples may be archived by prior arrangement.

If you have any questions, please contact Client Services at (510) 930-9090.

Larry Klein
Laboratory Director

CLEARWATER GROUP, INC.

SAMPLE ID: SB-3-1.5'
AEN LAB NO: 9609165-02
AEN WORK ORDER: 9609165
CLIENT PROJ. ID: C-154

DATE SAMPLED: 09/13/96
DATE RECEIVED: 09/13/96
REPORT DATE: 10/02/96

ANALYTE	METHOD/ CAS#	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED
BTEX & Gasoline HCs	EPA 8020				
Benzene	71-43-2	ND	5	ug/kg	09/19/96
Toluene	108-88-3	ND	5	ug/kg	09/19/96
Ethylbenzene	100-41-4	45 *	5	ug/kg	09/19/96
Xylenes, Total	1330-20-7	65 *	5	ug/kg	09/19/96
Purgeable HCs as Gasoline	5030/GCFID	2.9 *	0.2	mg/kg	09/19/96
#Extraction for TPH	EPA 3550	-		Extrn Date	09/17/96

Non-typical gasoline pattern observed.

ND = Not detected at or above the reporting limit
* = Value at or above reporting limit

CLEARWATER GROUP, INC.

SAMPLE ID: SB-2-6'
AEN LAB NO: 9609165-03
AEN WORK ORDER: 9609165
CLIENT PROJ. ID: C-154

DATE SAMPLED: 09/13/96
DATE RECEIVED: 09/13/96
REPORT DATE: 10/02/96

ANALYTE	METHOD/ CAS#	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED
BTEX & Gasoline HCs	EPA 8020				
Benzene	71-43-2	ND	5	ug/kg	09/19/96
Toluene	108-88-3	ND	5	ug/kg	09/19/96
Ethylbenzene	100-41-4	ND	5	ug/kg	09/19/96
Xylenes, Total	1330-20-7	5 *	5	ug/kg	09/19/96
Purgeable HCs as Gasoline	5030/GCFID	ND	0.2	mg/kg	09/19/96

ND = Not detected at or above the reporting limit
* = Value at or above reporting limit

AEN (CALIFORNIA)
QUALITY CONTROL REPORT

AEN JOB NUMBER: 9609165
CLIENT PROJECT ID: C-154

Quality Control and Project Summary

All laboratory quality control parameters were found to be within established limits.

Definitions

Laboratory Control Sample (LCS)/Method Spikes(s): Control samples of known composition. LCS and Method Spike data are used to validate batch analytical results.

Matrix Spike(s): Aliquot of a sample (aqueous or solid) with added quantities of specific compounds and subjected to the entire analytical procedure. Matrix spike and matrix spike duplicate QC data are advisory.

Method Blank: An analytical control consisting of all reagents, internal standards, and surrogate standards carried through the entire analytical process. Used to monitor laboratory background and reagent contamination.

Not Detected (ND): Not detected at or above the reporting limit.

Relative Percent Difference (RPD): An indication of method precision based on duplicate analyses.

Reporting Limit (RL): The lowest concentration routinely determined during laboratory operations. The RL is generally 1 to 10 times the Method Detection Limit (MDL). Reporting limits are matrix, method, and analyte dependent and take into account any dilutions performed as part of the analysis.

Surrogates: Organic compounds which are similar to analytes of interest in chemical behaviour, but are not found in environmental samples. Surrogates are added to all blanks, calibration and check standards, samples, and spiked samples. Surrogate recovery is monitored as an indication of acceptable sample preparation and instrument performance.

D: Surrogates diluted out.

!: Indicates result outside of established laboratory QC limits.

QUALITY CONTROL DATA

METHOD: EPA 8020, 5030 GCFID

AEN JOB NO: 9609165
INSTRUMENT: E
MATRIX: SOIL

Surrogate Standard Recovery Summary

Date Analyzed	Client Id.	Lab Id.	Percent Recovery Fluorobenzene
09/19/96	SB-3-1.5'	02	94
09/19/96	SB-2-6'	03	106
QC Limits:			70-130

DATE ANALYZED: 09/19/96
SAMPLE SPIKED: 9609137-02
INSTRUMENT: E

Matrix Spike Recovery Summary

Analyte	Spike Added (ug/kg)	Average Percent Recovery	RPD	QC Limits Percent Recovery	QC Limits RPD
Benzene	34.0	110	7	79-113	26
Toluene	108	103	4	84-110	20
Hydrocarbons as Gasoline	1000	110	2	60-126	20

Daily method blanks for all associated analytical runs showed no contamination at or above the reporting limit.

*** END OF REPORT ***

AEN WORK ORDER: 9609165
CLIENT: CLEARWATER GROUP, INC.
CLIENT PROJ. ID: C-154

PETROLEUM HYDROCARBON ID SUMMARY

AEN ID	CLIENT ID	MATRIX	CARBON RANGE	SUMMARY OF RESULTS
9609165-02	SB-3-1.5'	SOIL	$<C_7$ - C_{12}	Appears to be very weathered gasoline or possibly a type of mineral spirits.
			C_{16} - C_{44+}	Characteristic pattern when asphalt is present in a sample.

This summary report is part of a package that includes sample chromatograms and a quantitation report.

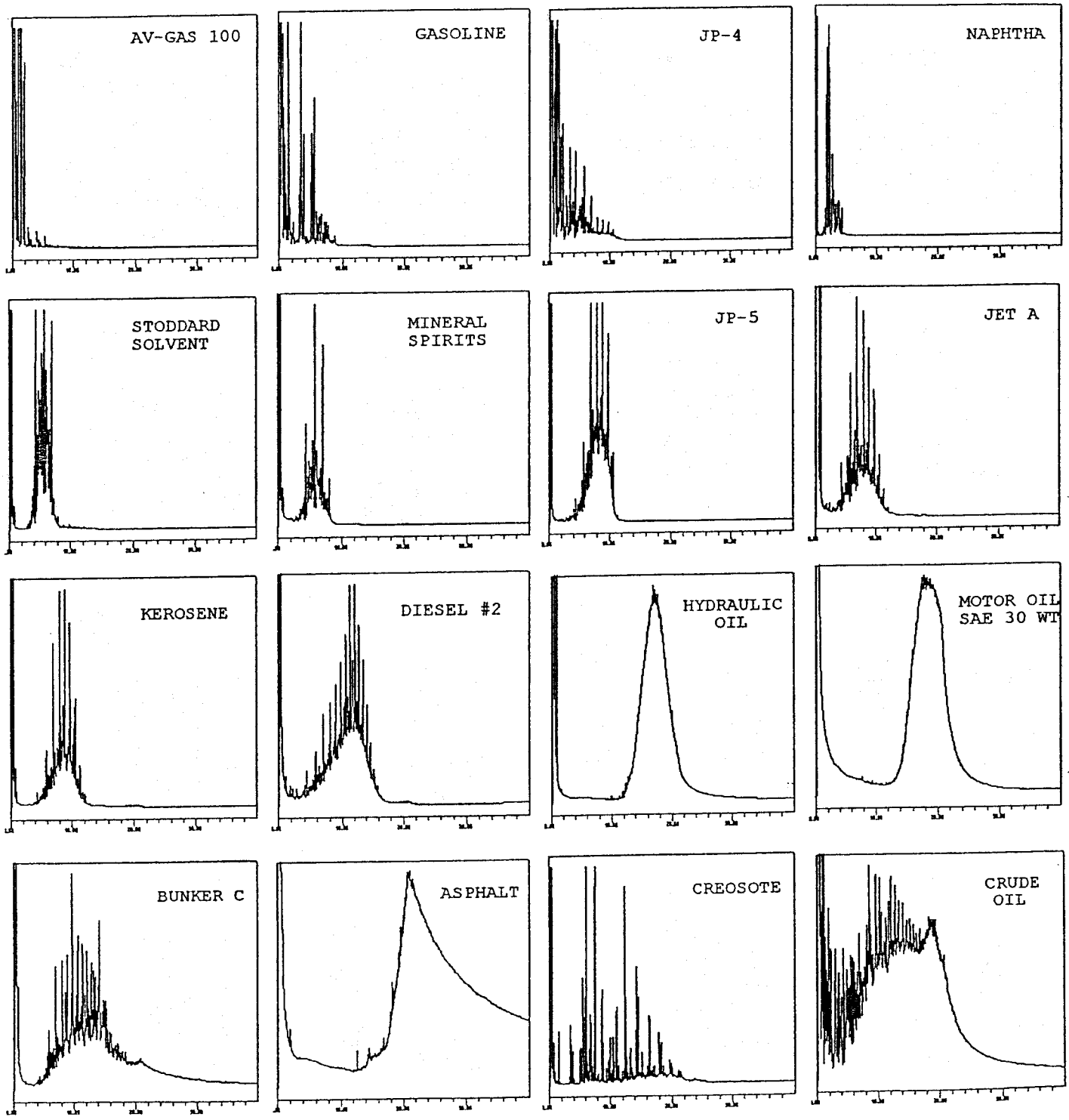
American Environmental Network

HYDROCARBON PATTERNS

System: GC_A
Column: RTX-2887,10m,0.53mm ID,2.65um FT
Temp Program: 45 deg C, 3min, 15 deg C/min, 310 deg C, 25min
Inj Temp: 290 deg C, Det Temp: 310 deg C

Flow Rate: Helium 12mls/min
Detector: FID

HP 5890 Gas Chromatograph

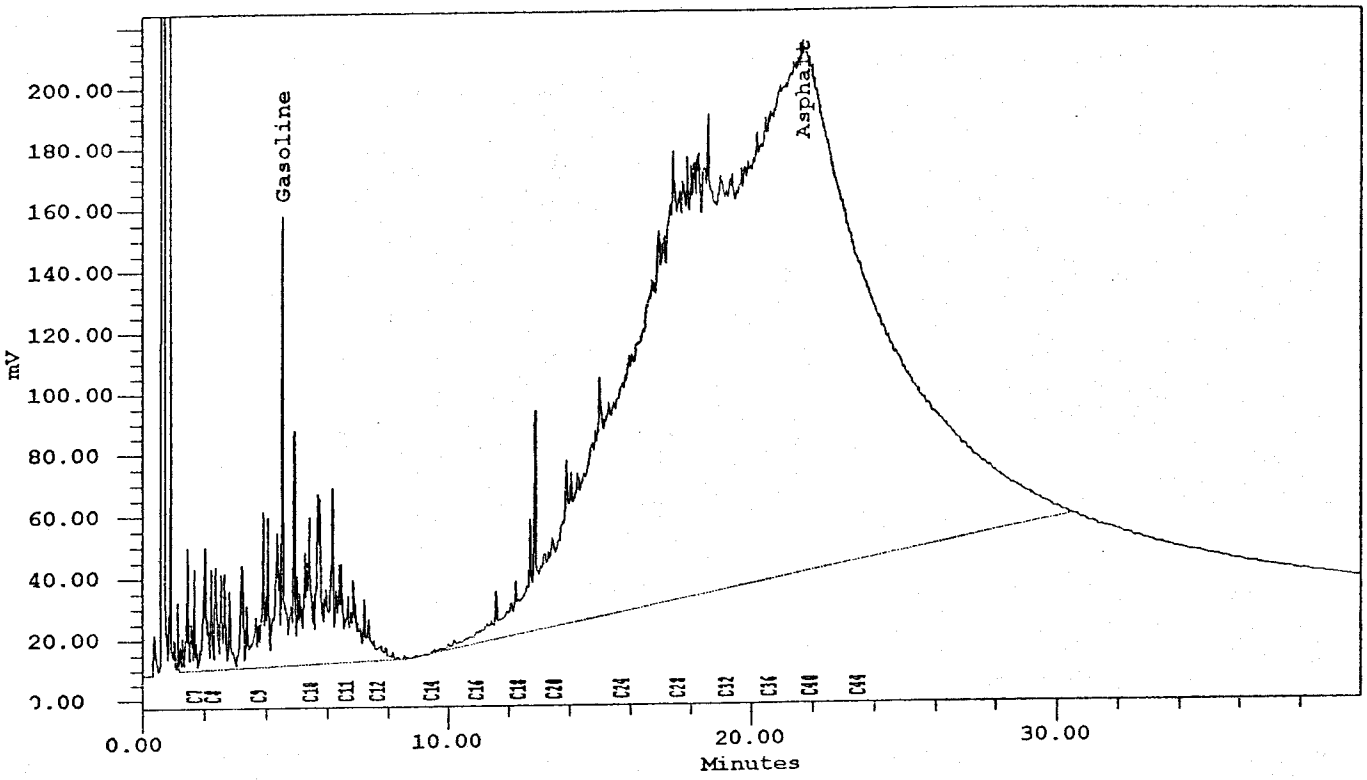


American Environmental Network

HYDROCARBON REPORT

mpleName: 09165-2A CS2 EXT
Date Acquired: 09/20/96 10:34:26 AM
Dilution: 10 SampleWeight: 20.0

System: GC_A
Processing Method: PRODSUM
Set Name: A0920 Vial: 2



Hydrocarbon Results

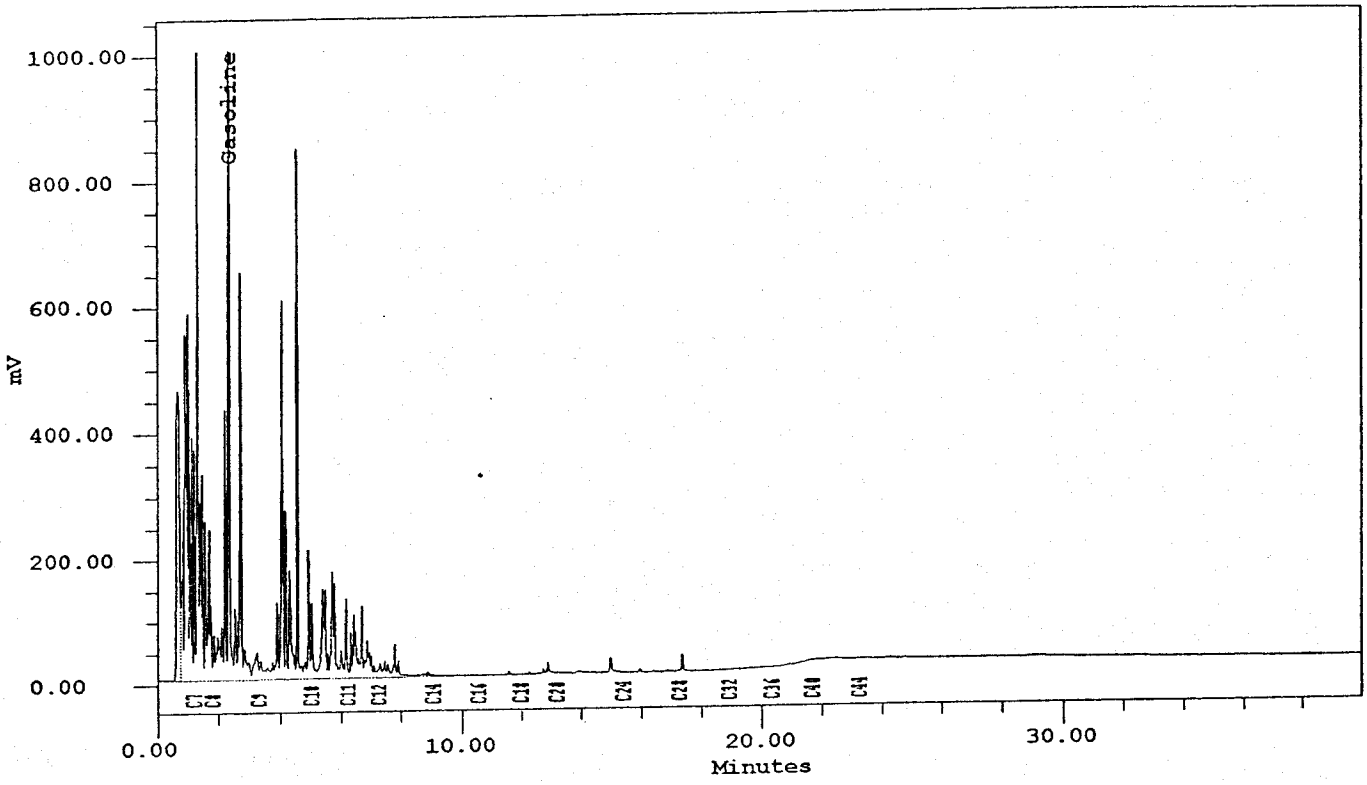
#	Name	RT(min) (min)	Area (uV*sec)	Ins Con(ppm)	Spl Con(ppm)
1	SURROGATE				
2	JP-4	3.00			
3	Naphtha	3.50			
4	Gasoline	4.55	6928741	180.5	90.261
5	Stoddard Solvent	5.00			
6	Mineral Spirits	6.00			
7	Chloro-octane(Surr)	6.25			
8	Jet A	8.00			
9	Kerosene	9.00			
10	Diesel #2	12.00			
11	Pentacosane(Surr)	16.90			
12	Hydraulic Oil	17.00			
13	Motor Oil	19.00			
14	Bunker C	20.00			
15	Asphalt	21.65	84524916	2652.1	1326.027
16	Creosote	22.00			
17	Crude Oil	23.00			

American Environmental Network

HYDROCARBON REPORT

ampleName: GASOLINE
Date Acquired: 09/20/96 11:31:51 AM
Dilution: 1 SampleWeight: 1.0

System: GC_A
Processing Method: PRODSUM
Set Name: A0920 Vial: 3



Hydrocarbon Results

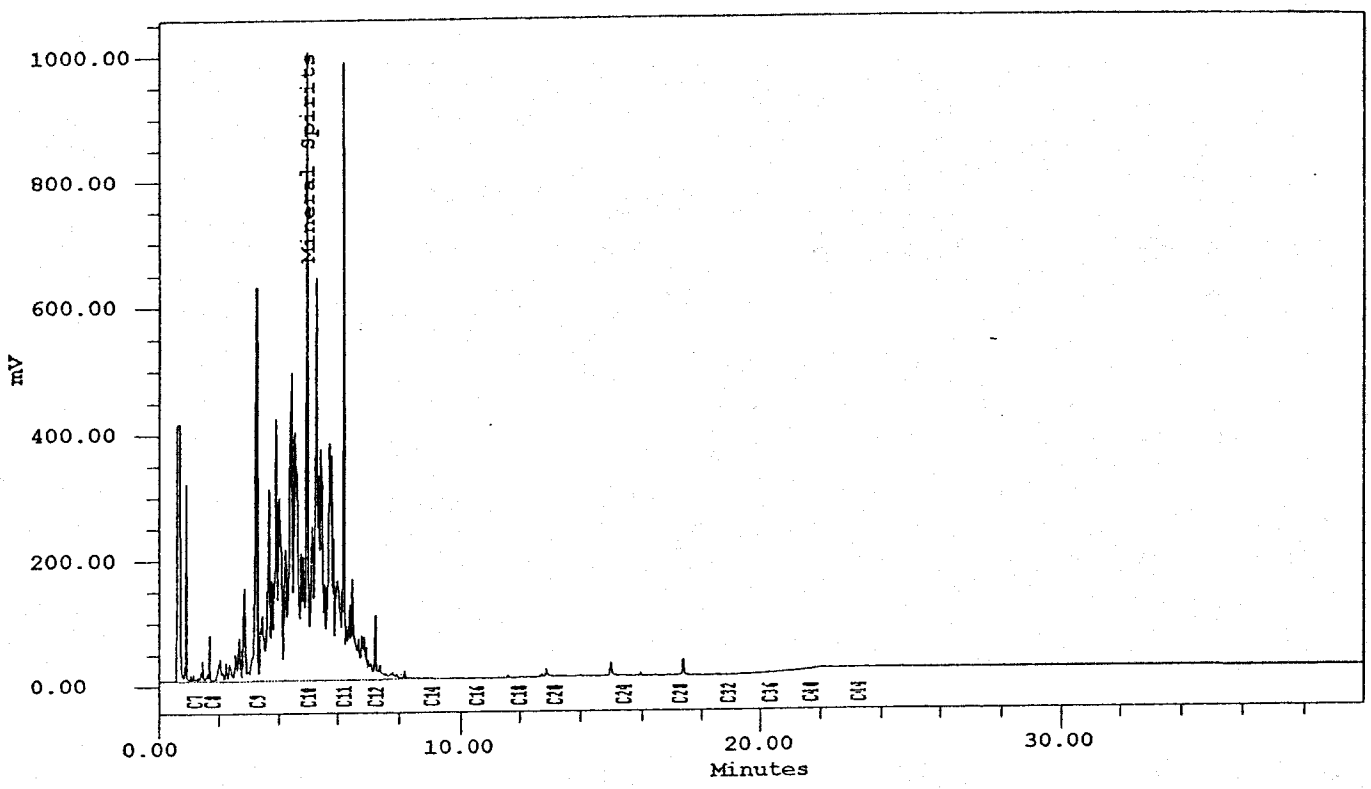
#	Name	RT(min) (min)	Area (uV*sec)	Ins Con(ppm)	Spl Con(ppm)
1	SURROGATE				
2	Gasoline	2.37	36950739	962.7	962.715
3	JP-4	3.00			
4	Naphtha	3.50			
5	Stoddard Solvent	5.00			
6	Mineral Spirits	6.00			
7	Chloro-octane(Surr)	6.25			
8	Jet A	8.00			
9	Kerosene	9.00			
10	Diesel #2	12.00			
11	Pentacosane(Surr)	16.90			
12	Hydraulic Oil	17.00			
13	Motor Oil	19.00			
14	Bunker C	20.00			
15	Asphalt	21.00			
16	Creosote	22.00			
17	Crude Oil	23.00			

American Environmental Network

HYDROCARBON REPORT

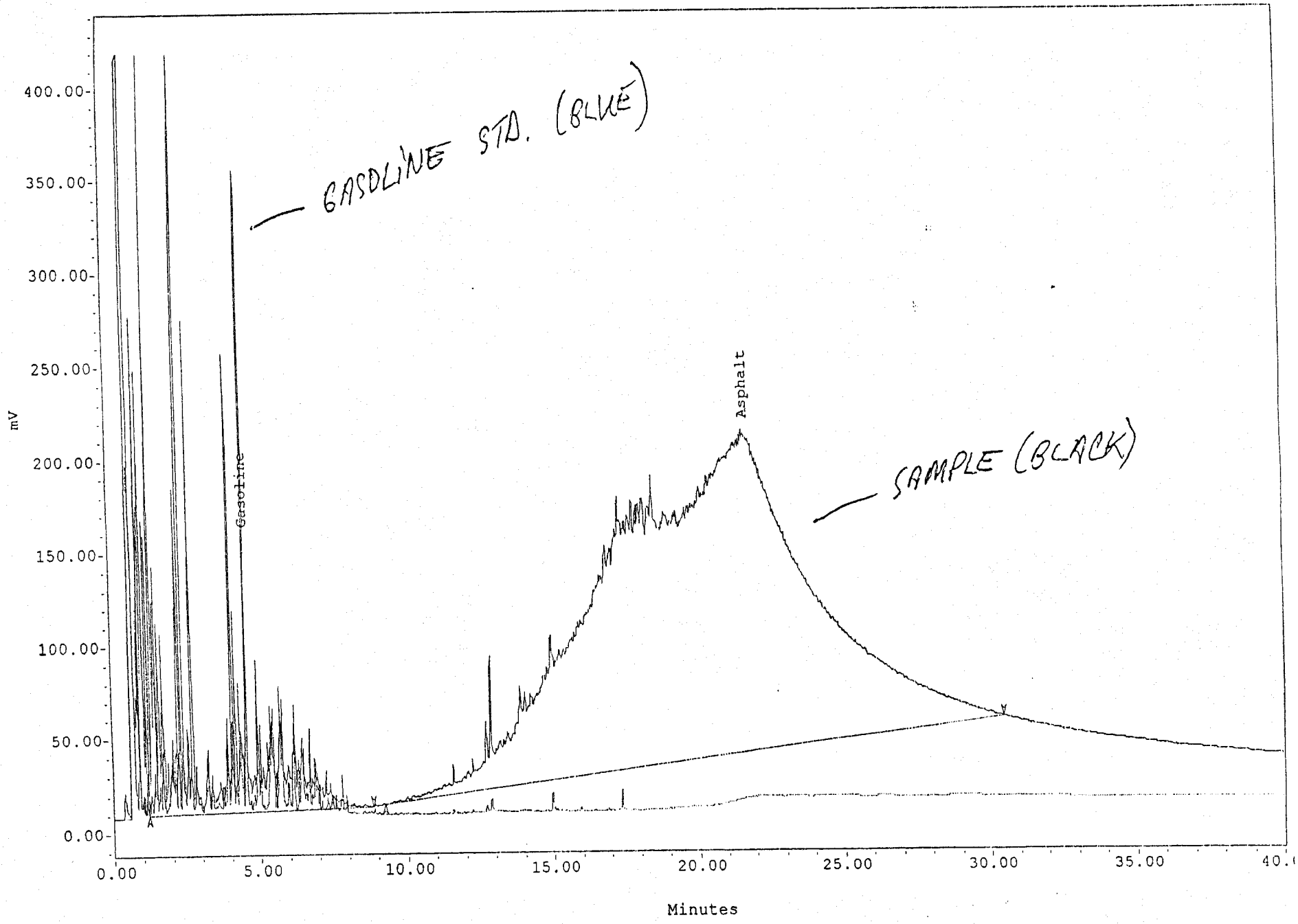
SampleName: MINERAL SPIRITS
Date Acquired: 09/20/96 12:29:24 PM
Dilution: 1 SampleWeight: 1.0

System: GC_A
Processing Method: PRODSUM
Set Name: A0920 Vial: 4

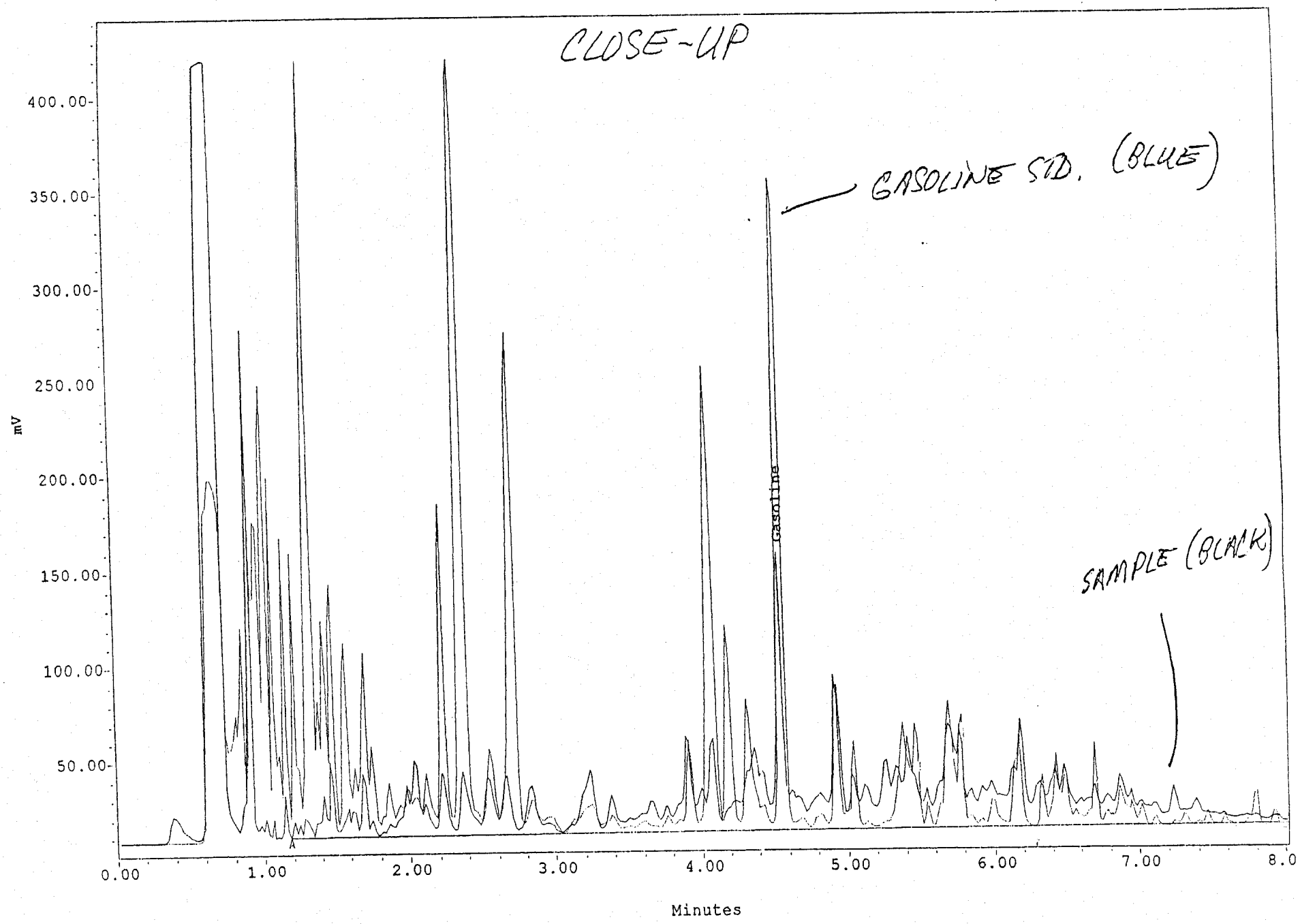


Hydrocarbon Results

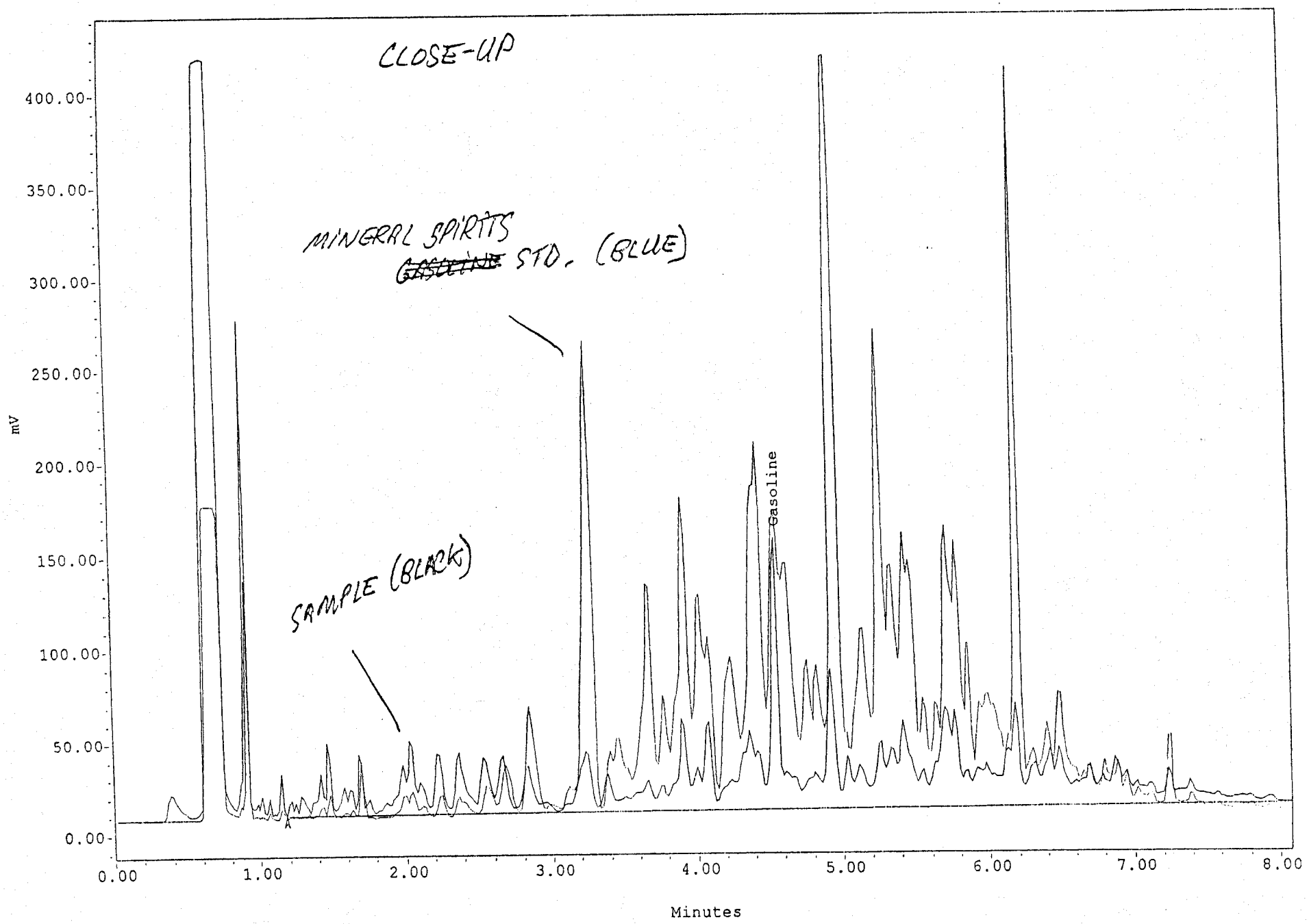
#	Name	RT(min) (min)	Area (uV*sec)	Ins Con(ppm)	Spl Con(ppm)
1	SURROGATE				
2	Gasoline	2.00			
3	JP-4	3.00			
4	Naphtha	3.50			
5	Mineral Spirits	4.97	46637529	1215.1	1215.094
6	Stoddard Solvent	5.00			
7	Chloro-octane(Surr)	6.25			
8	Jet A	8.00			
9	Kerosene	9.00			
10	Diesel #2	12.00			
11	Pentacosane(Surr)	16.90			
12	Hydraulic Oil	17.00			
13	Motor Oil	19.00			
14	Bunker C	20.00			
15	Asphalt	21.00			
16	Creosote	22.00			
17	Crude Oil	23.00			



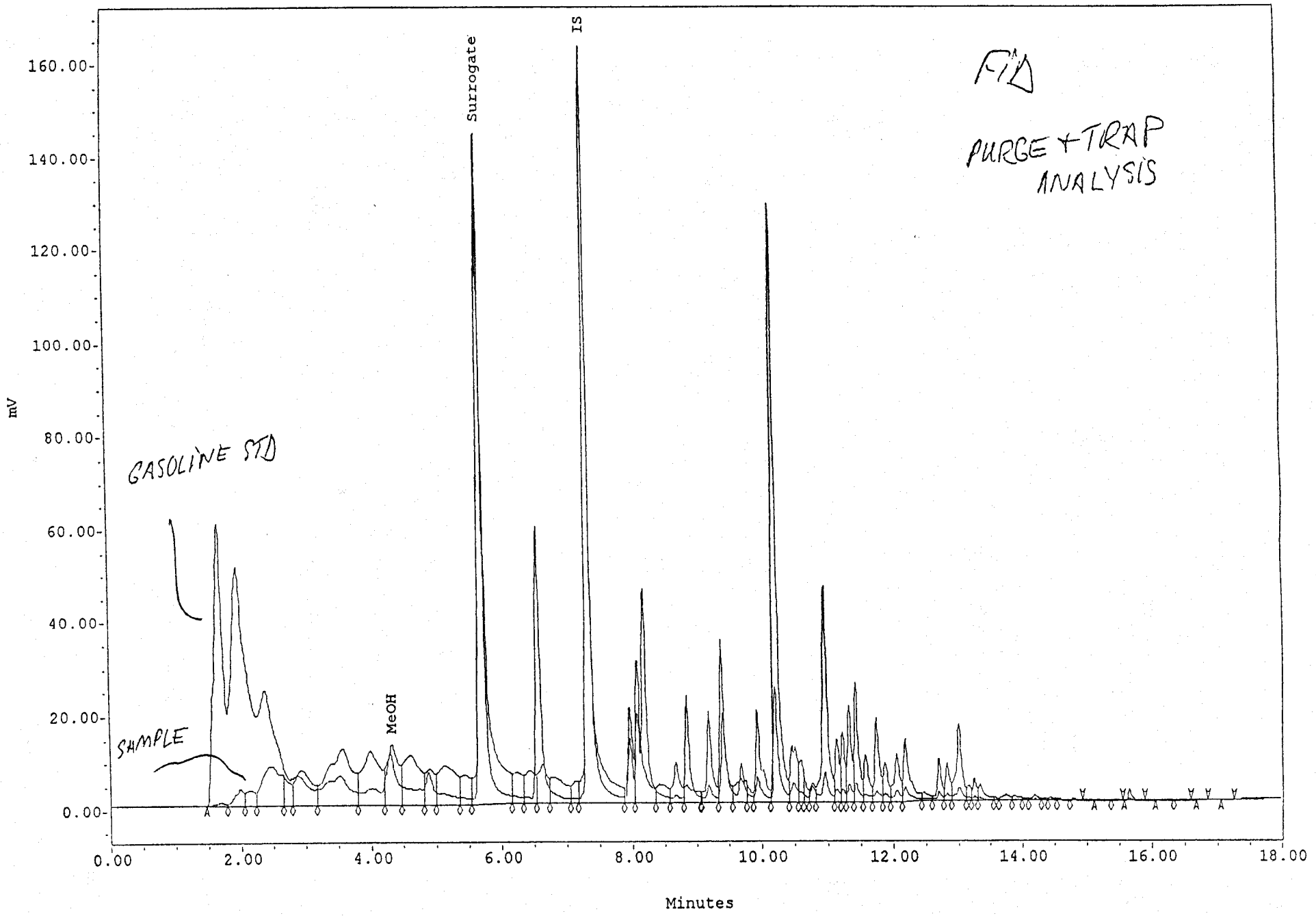
SampleNa . 09165-2A CS2 EXT Vial: 2 Inj: 1 Ch: SATIN Type: nown



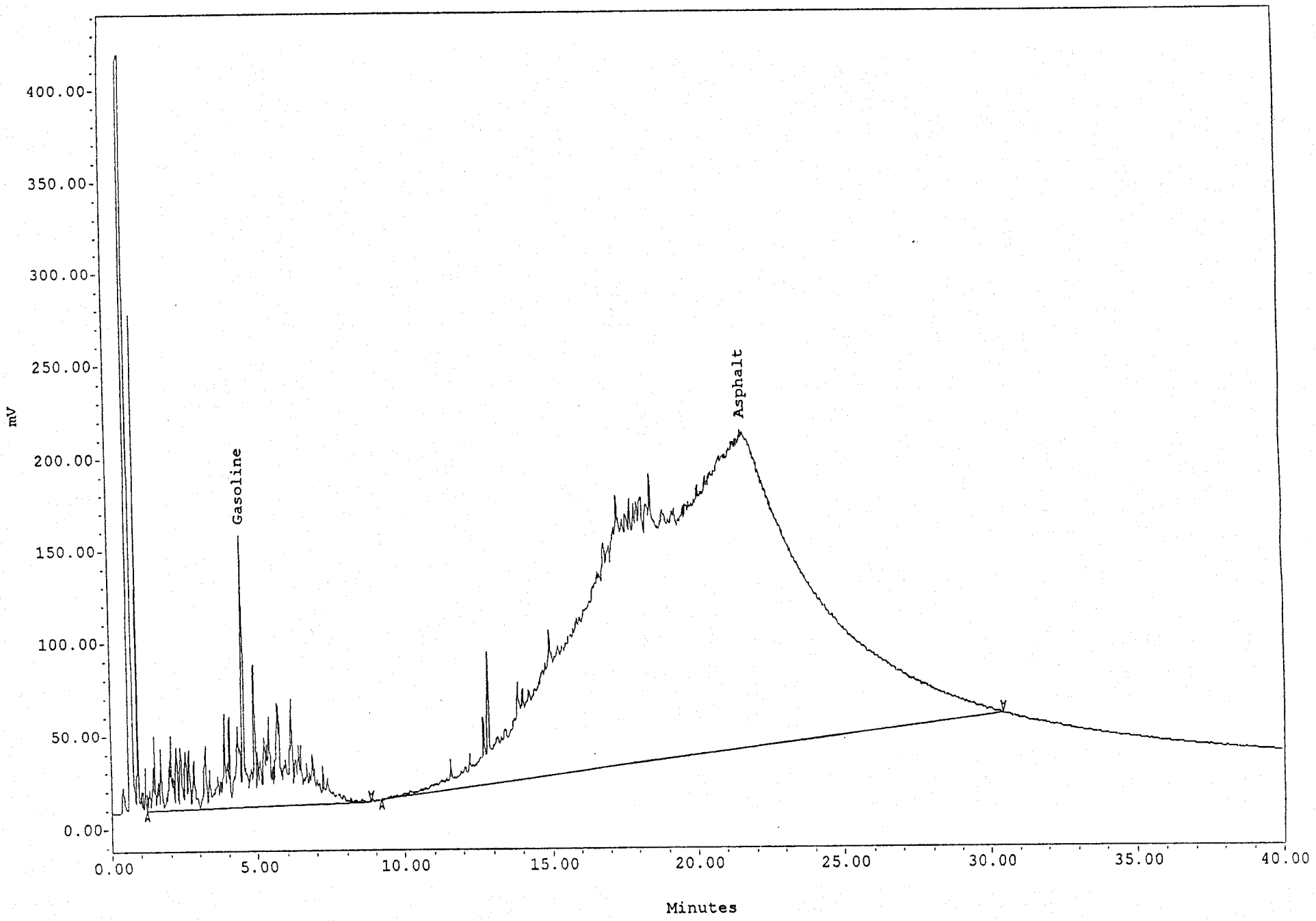
SampleN. 09165-2A CS2 EXT Vial: 2 Inj: 1 Ch: SATIN Type. known



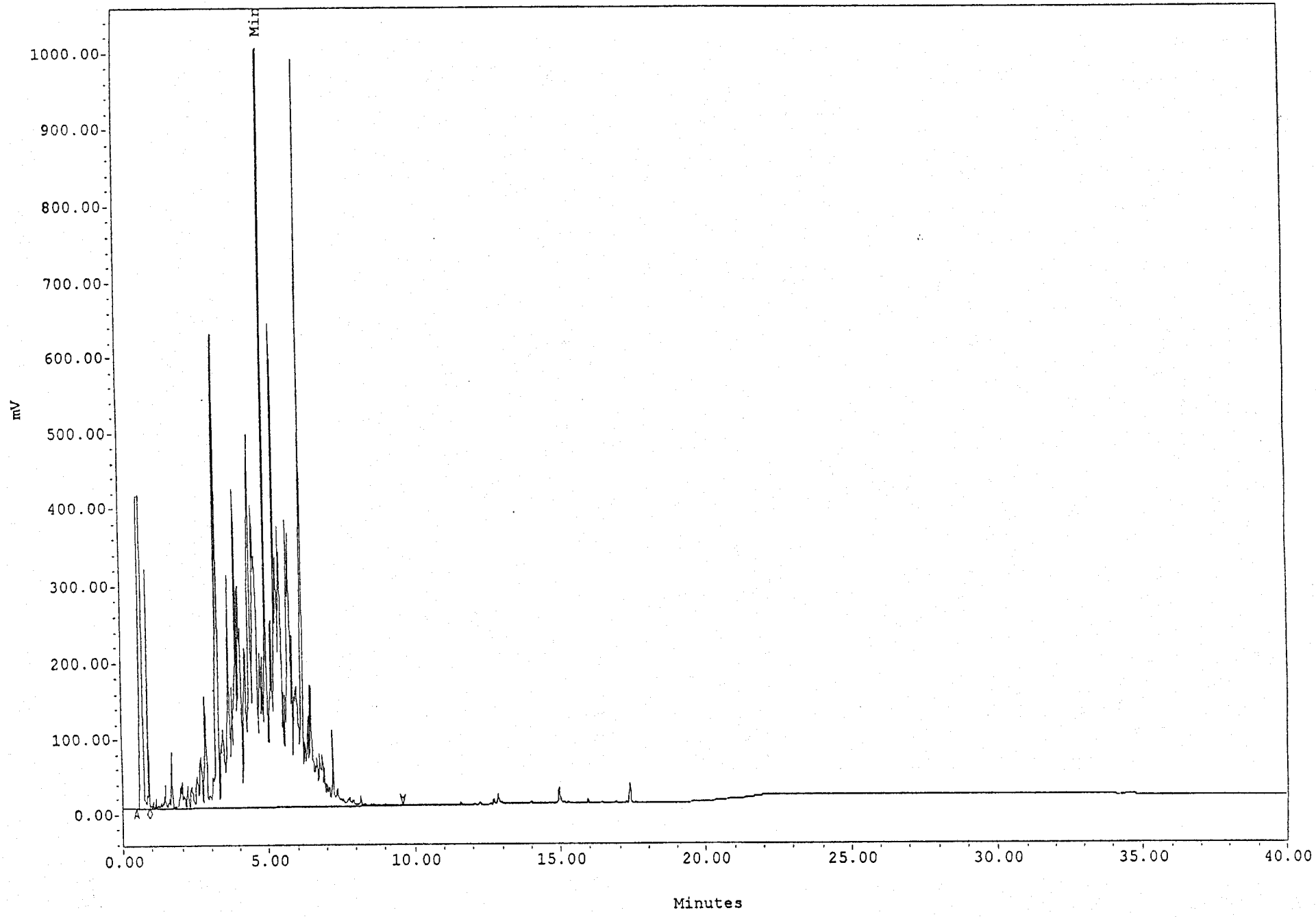
Sample: 09165-2A CS2 EXT Vial: 2 Inj: 1 Ch: SATIN Type: Known



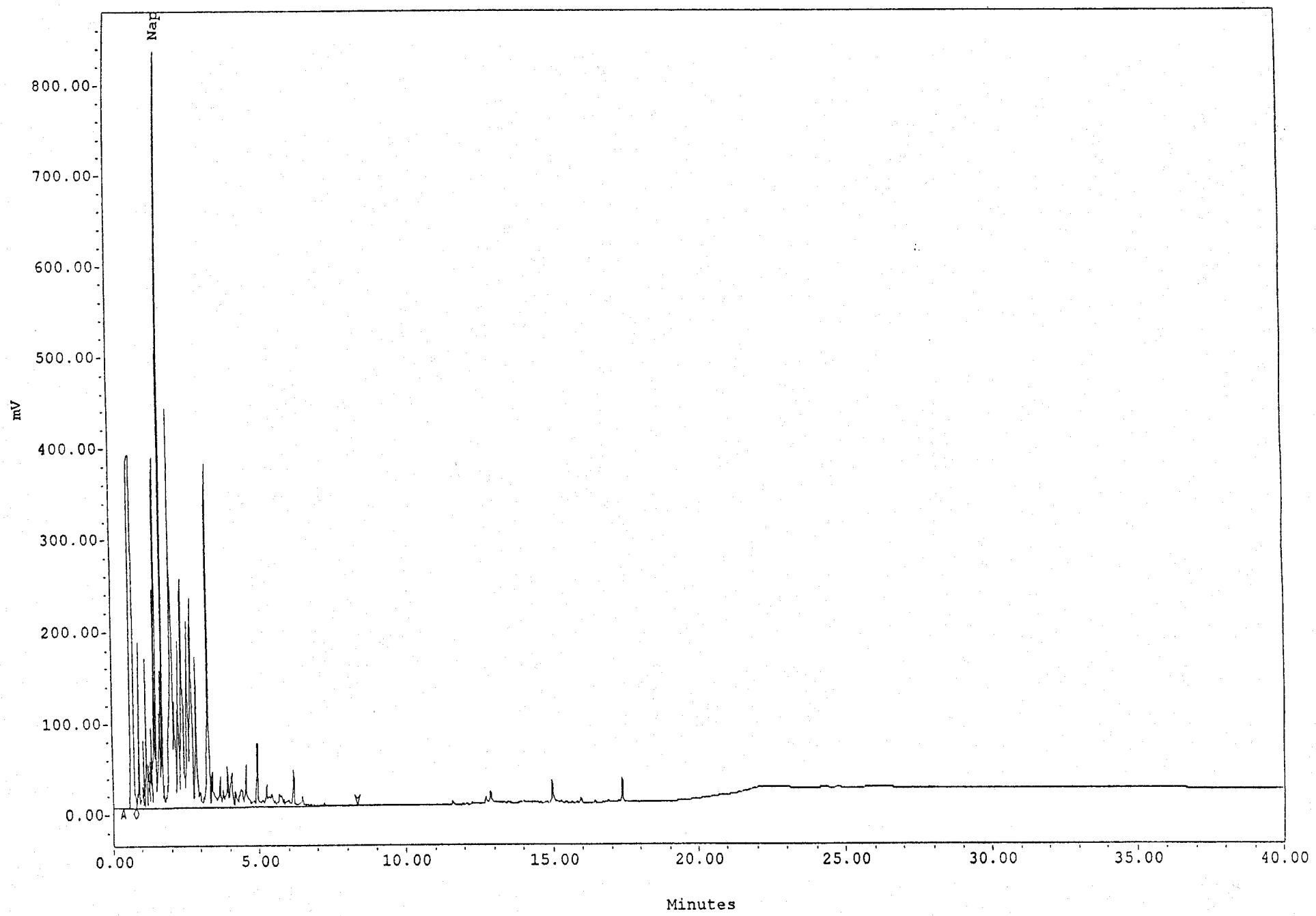
Sample: 09165-02A Vial: 12 Inj: 1 Ch: SATIN Type: Unknow.



Sample. : 09165-2A CS2 EXT Vial: 2 Inj: 1 Ch: SATIN Type. nown



Sample: MINERAL SPIRITS Vial: 4 Inj: 1 Ch: SATIN Type: own



Sample : NAPHTHA Vial: 7 Inj: 1 Ch: SATIN Type: Unknown

Reporting Information:

1. Client: Groundwater Group, Inc.
Address: S. Third St, #1104
Oakland, CA 94607
Contact: Brian Gwinn
Alt. Contact: Juniper Nell

American Environmental Network
3440 Vincent Road, Pleasant Hill, C. 23
Phone (510) 930-9090
FAX (510) 930-0256

RECEIVED OCT 0 3 1996

AEN R-7 51 Page 1 of 1

REQUEST FOR ANALYSIS / CHAIN CUSTODY

Lab Job Number: 9609165
Lab Destination:
Date Samples Shipped:
Lab Contact:
Date Results Required:
Date Report Required:
Client Phone No.:
Client FAX No.:

Address Report To:
2. As Above

Send Invoice To:
3. As Above

Send Report To: (1) or 2 (Circle one)
Client P.O. No.: MOCHA 628 2nd St. Client Project I.D. No.: C-154
Sample Team Member (s) Brian Gwinn

Lab Number	Client Sample Identification	Air Volume	Date/ Time Collected	Sample Type*	Pres.	No. of Cont.	Type of Cont.	TPH/BTEX	Fuel Fingerprint	Comments / Hazards
01A	SB-3-1'	—	9/12/96 1130	8	ø	1	tube	X	X	Hold - use if you run out of SB-3-1.5'
02A	SB-3-1.5'	—	1145	↓	↓	↓	↓	X	X	
03A	SB-2-6'	—	1200	↓	↓	↓	↓	X		

NOTE: Run Fuel Fingerprint on SB-3-1.5', then analyze SB-2-6' for any compounds identified by fingerprint.

	DATE	TIME		DATE	TIME
Relinquished by: (Signature)	9/13/96	1515	Received by: (Signature)	9/13/96	1515
Relinquished by: (Signature)	9-13-96	16:30	Received by: (Signature)	9-13-96	1630
Relinquished by: (Signature)	DATE	TIME	Received by: (Signature)	DATE	TIME
Method of Shipment			Lab Comments		

*Sample type (Specify): 1) 37mm 0.8 µm MCEF 2) 25mm 0.8 µm MCEF 3) 25mm 0.4 µm polycarb. filter
4) PVC filter, diam. ____ pore size ____ 5) Charcoal tube 6) Silica gel tube 7) Water 8) Soil 9) Bulk Sample
10) Other ____ 11) Other ____

COPIES: WHITE - JOB FILE YELLOW - PROJECT FILE PINK - CLIENT