LUST #48468
Black Mountain Ranch

REPORT
INTERIM REMEDIAL ACTION

BLACK MOUNTAIN RANCH
6417 MOUNT BAKER HIGHWAY
DEMING, WASHINGTON

Prepared For:

Gary Mitchell
Black Mountain Ranch
6417 Mount Baker Highway
Deming, WA 98244

RECEIVED
DEC 10 1999
DEPT. OF ECOLOGY

DEPARTMENT OF ECOLOGY
NWRO/TCP TANKS UNIT
INTERIM CLEANUP REPORT
SITE CHARACTERIZATION
FINAL CLEANUP REPORT
OTHER _____
AFFECTED MEDIA: SOIL
OTHER _____ GW
INSPECTOR (INIT.) SB DATE 5/5/00

ENGINEERING & ENVIRONMENTAL, INC.

2138 Humboldt Street
Bellingham, WA 98225
(360) 676-9589 (800) 859-5597
Fax (360) 676-4625

LUST CLEANUP REPORT REVIEW

LUST # 481468 **UST #** _____ **Site Name** Black Mountain Ranch

Change in Status of Release & Date (Awaiting Cleanup) (Cleanup Started) (Monitoring) (Reported Cleaned Up) (No Further Action) (Unknown) **Date** _____

Cause of Release (Overfill) (Piping Failure) (Spill)(Tank Failure) (Unknown)
Remediation Technologies Used _____

Report Title Interim Remedial Action **Report Date** 12/7/99

Report Type (Interim) (Monitoring) (Final) (Site Characterization) (Unknown)

Date Received 12/10/99 **Contractor** BEK Engineering + Environmental, Inc.

Comments December 98 depth to gw @ 8' bgs ; Sept 99 gw @ 11.5' bgs. Limited PCS removal during Sept. 99, PCS remains in excess of MTCA A in excavation bottom and south wall. PCS in contact w/ water table - impact likely.

Fund Source (LUST Trust Fund) (PLIA) (Responsible Party) (State Fund)

VCP/IRAP Status (Requested) (Not Requested) (Complete) **Reviewed by** Bremer

Date 5/3/00

BEK ENGINEERING & ENVIRONMENTAL, INC. BELLINGHAM • EVERETT

CIVIL • GEOTECHNICAL • ENVIRONMENTAL • WETLANDS

360-676-9589
800-859-5597
FAX 360-676-4625

December 7, 1999

Washington State Department of Ecology
Northwest Region
3190 160th Ave SE
Bellevue, WA 98008-5452

Attn: John Lillie

Re: **Interim Remedial Action**
Black Mountain Ranch (Ecology Site ID #481461, Release ID #481468)
6417 Mount Baker Highway
Deming, Washington

Dear Mr. Lillie:

On the behalf of Black Mountain Ranch, BEK Engineering & Environmental, Inc. (BEK) is pleased to present this Interim Remedial Action report regarding the release of hydrocarbon products from a leaking underground storage tank at the above referenced property in Whatcom County. At this time our client is contemplating additional remedial action, and does not wish to enter into the Voluntary Cleanup Program.

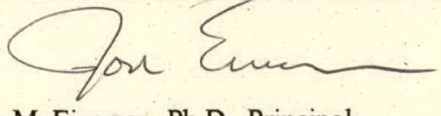
This report provides information regarding subsurface conditions, a description of remedial actions completed, and recommendations for future remedial activities at the subject property.

A copy of this report has been transmitted to Bill Angel at Whatcom County Health and Human Services.

Should you have any questions concerning this report or require further information, please contact our office at (360)-676-9589 or (800)-859-5597.

Sincerely,

BEK ENGINEERING & ENVIRONMENTAL, INC.



Jon M. Einarsen, Ph.D., Principal
Geologist

cc: Gary Mitchell, Black Mountain Ranch
Bill Angel, Whatcom County Health and Human Services

BEK ENGINEERING & ENVIRONMENTAL, INC. BELLINGHAM • EVERETT

CIVIL • GEOTECHNICAL • ENVIRONMENTAL • WETLANDS

360-676-9589
800-859-5597
FAX 360-676-4625

December 7, 1999

Black Mountain Ranch
6417 Mount Baker Highway
Deming, WA 98244

Attn: Mr. Gary Mitchell

Re: **Interim Remedial Action**
Black Mountain Ranch (Ecology Site ID #481461, Release ID #481468)
6417 Mount Baker Highway
Deming, Washington

Dear Mr. Mitchell:

BEK Engineering & Environmental, Inc. (BEK) is pleased to present the results of a site characterization and interim remedial action following the removal of gasoline contaminated soil at the above referenced property in Deming, Washington. This report was completed in general accordance with our proposal dated February 4, 1999 and with the *Model Toxics Control Act Cleanup Regulation* (MTCA, WAC 173-340) and Ecology's Voluntary Cleanup Program.

A copy of this report and all appendices has been transmitted to John Lillie at the Washington State Department of Ecology and Bill Angel at Whatcom County Health and Human Services.

SCOPE OF SERVICES

Our scope of services for this project included:

1. Observe the excavation of contaminated soil above the water table, and complete field testing to evaluate when all of the soil with gasoline concentrations exceeding the cleanup standard has been removed from the former UST pit.
2. Arrange for quantitative laboratory analyses of soil samples at a Washington State Department of Ecology accredited laboratory.
3. Arrange for the transportation of samples to the laboratory using proper chain-of-custody procedures.
4. Complete this report and provide recommendations for further subsurface investigative and remedial action.

INTRODUCTION

One underground storage tank (UST) was removed from a single UST pit on December 11, 1998 by Ultra Tank Services, Inc. of Bellingham, Washington. The tank had been used to store gasoline for private use by the Black Mountain Ranch. Details regarding the UST removal are explained in a report prepared by BEK entitled *Underground Storage Tank Removal, Black Mountain Ranch* (dated January 8, 1999). The tank is currently listed as removed on Ecology's UST List. Soil in the tank pit were observed to be contaminated down to the top of the water table, at a depth of approximately eight feet below the ground surface (bgs). Analytical testing confirmed gasoline concentrations in soil at levels (5,200 mg/kg to 12,000 mg/kg) in excess of the MTCA Method A cleanup standards (100 mg/kg) in the UST pit. The

UST pit was backfilled and further sub-surface investigative action was postponed until September 20, 1999 when the ground water table was estimated to be at its lowest elevation. The lower ground water elevation would allow removal of additional contaminated soil above the water table.

This report provides a summary of the site vicinity characteristics, a description of our field observations during removal of gasoline contaminated soil, and the analytical results for soil samples collected from the excavation and remedial action initiated to properly dispose of contaminated soil removed from the excavation.

SITE VICINITY CHARACTERISTICS

The subject property is located at 6417 Mount Baker Highway, in Whatcom County, Washington. A site vicinity map is presented in Figure 1 (Appendix I). The property lies approximately 3000 feet north of the Nooksack River, at an elevation of approximately 430 feet MSL. The ground surface slopes gently to the west towards Kendall Creek. The vicinity of the subject property is zoned R5A, rural one unit per five acres. A small creek bounds the subject property to the north. Mount Baker Highway bounds the subject property to the west. Forested areas bound the subject property to the east. The Nooksack River and residential properties bound the subject property to the south.

The geologic conditions in the vicinity of the subject property are described in the *Geologic Map of the Bellingham 1:100,000 Quadrangle, Washington* (Pringle et al., 1994). According to that map, the subject property is underlain by a former outwash plain of the Sumas Stade. Deposits in the outwash plain consist of boulders, cobbles, and gravel near the Canadian border, grading southwestward to sand near Lynden. These sediments were deposited in outwash streams when the terminus of the continental icesheet was in the vicinity of Sumas, Washington. Soil in the vicinity of the subject property was tan to brown silt with sand grading to gray sandy gravel with silt.

The *Soil Survey of Whatcom County Area, Washington* (U.S.D.A., 1992) describes soil in the vicinity of the subject property as Winston Silt Loam. This soil formed in a mixture of loess and volcanic ash over glacial outwash. It is located on outwash terraces and is very deep and well drained. Permeability is moderate in the upper part of the soil and rapid in the lower part.

FIELD OBSERVATIONS

BEK personnel were on-site to supervise removal of gasoline contaminated soil on September 20, 1999. The presence of contaminated soil was evaluated with headspace analysis using a Photovac Microtip (HL-2000) photoionization detector calibrated with isobutylene (100 ppm), odor, and visual observation. The sidewalls of the excavation were observed to evaluate subsurface soil conditions. Native soil consists of silty sand with lenses of sand and sandy gravel. Water and power utilities were encountered in the excavation at a depth of approximately 1.5 feet below the ground surface (bgs). The utility trenches lie above the zone of contamination, and there is no risk that contaminants have migrated along utility trenches. Ground water was observed at approximately 11.5 feet (bgs). A light to moderate hydrocarbon sheen was observed on the ground water.

Hydrocarbon contaminated soil appears to be limited to the zone of ground water fluctuation, between approximately 7.0 feet bgs and 12.0 feet to 14.0 feet bgs. Due to the presence of ground water at approximately 11.5 feet bgs, impacted soil could only be excavated to a depth of approximately 12.0 feet bgs. Overlying soil has not been impacted and was stockpiled on the site. Field screening indicated that soil contamination extended away from the former tank location in a southeasterly direction. Excavation continued in a southeasterly direction to a location adjacent to an existing building on the subject property (the Recreation Center), and was stopped at that time by request of the Client. Confirmation soil samples

were collected from the floor and sidewalls of the excavation to evaluate the effectiveness of the remedial action. A generalized site plan indicating the extent of the excavation and sampling locations is presented in Figure 2 (Appendix I).

Approximately 140 cubic yards of petroleum hydrocarbon contaminated soil was removed from the excavation. Impacted soil was transported to Everett and remediated using thermal desorption by CSR. Copies of the Release of Liability / Certificate of Disposal provided by CSR for the subject property are included in Appendix I. Approximately 270 tons of soil was remediated.

ANALYTICAL RESULTS

All samples were analyzed for gasoline range hydrocarbons and BTEX by CCI Analytical Laboratories, Inc. (Everett, Washington), using the NWTPH-GX and BTEX Method, respectively. Analytical results for samples collected immediately following the tank removal, as described in our report entitled *Underground Storage Tank Removal, Black Mountain Ranch*, indicated gasoline and lead concentrations ranging from 5,200 mg/kg to 12,000 mg/kg and 12 mg/kg to 26 mg/kg, respectively. Therefore soil samples collected for this investigation were not analyzed for lead. The complete laboratory reports are included in Appendix II and the results are summarized in Table 1.

TABLE 1
Analytical Results – Residual Soil
Samples Collected 9/20-21/99

Sample #	Sample Location	Depth (feet)	Field Screening Results		Gasoline (mg/kg)	Volatile Aromatic Hydrocarbons (mg/kg)			
			Headspace Vapors (ppm)	Sheen		B	T	E	X
092099-1	Northeast Wall	8.0	0	NA	ND<5	ND(<0.1)	ND(<0.1)	ND(<0.1)	ND(<0.3)
092099-4	East Pit Floor	11.5	>2500	NA	5,900	ND(<10)	ND(<10)	ND(<10)	37
092199-3	Southwest Wall	10.5	>2500	NA	8,900	ND(<10)	ND(<10)	41	230
092199-4	North Wall	10.0	500	NA	100	ND(<0.2)	ND(<0.2)	0.4	ND(<0.6)
092199-5	Northwest Wall	10.5	1410	NA	160	ND(<0.2)	ND(<0.2)	0.3	ND(<0.6)
092199-7	West Wall	11.0	70	NA	ND<5	ND(<0.1)	ND(<0.1)	ND(<0.1)	ND(<0.3)
092199-8	Southeast Wall	10.5	1950	NA	350	ND(<0.1)	0.5	0.7	1.3
Method A Cleanup Standard					100	0.5	40	20	20

Shading indicates value above MTCA Method A Cleanup Standard. B =Benzene, T =Toluene, E =Ethylbenzene, X =Total Xylenes.
ND - not detected at indicated concentration; mg/kg = parts-per-million.
NA - not analyzed

Gasoline range hydrocarbons were detected above the Model Toxics Control Act (MTCA, WAC 173-400) residential cleanup standards for total gasoline in samples 092099-4, 092199-3, -5 and -8. Samples 092099-4 and 092199-3 also exceeded the cleanup standards for total xylenes, and sample 092199-3 exceeded the cleanup standards for Ethylbenzene. Based on these analytical results, residual soil in the excavation floor and the south sidewall exceed the MTCA residential cleanup standards for gasoline.

The shape of the excavation and the analytical results suggest that ground water is flowing in a southerly or southeasterly direction.

CONCLUSIONS

One underground gasoline storage tank was removed from the Black Mountain Ranch on December 11, 1998. Upon excavation it was observed that gasoline contaminated soil emanated from beneath the former location of the fuel pump, which had been located adjacent to and immediately south of the tank. The source of contamination is therefore likely to have been a leaking fitting in the distribution line near the fuel pump, possibly combined with overfilling of vehicles. Analytical results confirmed the release. Excavation of the contaminated soil occurred on September 20 and 21, 1999 when the ground water table was assumed to be lower. Excavation was halted at the Clients request near an existing building on the project site.

The former underground storage tank and fuel pump have been removed, and therefore the source of contamination has been mitigated. Approximately 140 cubic yards of impacted soil has been removed and properly remediated, including the most contaminated soil (12,000 mg/kg gasoline) located immediately adjacent to the former underground storage tank.

Analytical results indicate that residual hydrocarbon concentrations in soil above the ground water table are below MTCA Method A cleanup standards on the north and west sides of the excavation. However, residual hydrocarbon concentrations in soil are above the cleanup standards on the floor of the excavation and on the south wall of the excavation. Based on the presence of impacted soil at the top of the water table, it is our opinion that ground water has also been impacted.

RECOMMENDATIONS

We recommend a remedial investigation and feasibility study (RI/FS) to quantitatively assess the physical characteristics of the site and the extent of petroleum hydrocarbon impact to soil and ground water. The MTCA requires a ground water investigation in those cases where contaminated soil extends to the water table. An RI/FS would include a detailed evaluation of subsurface geologic and hydrogeologic conditions, ground water flow conditions, contaminant migration, and potential impacts of the release to human health and the environment. Upon completion of the RI/FS cleanup technologies appropriate for the local site conditions can be selected and implemented. We expect that the cost of the RI/FS would range from approximately $16,000 to $24,000 including subcontractor fees. The investigation would utilize a geo-probe and monitoring well installations combined with analytical results for soil and ground water samples to define the extent of the contamination.

It is our opinion that a RI/FS will reveal that additional excavation of contaminated soil above the water table on the south sidewall would be beneficial. Excavation of this soil will further decrease the potential for additional impacts to ground water. It is probably not practical to excavate the residual contaminated soil below the water table on the floor of the excavation. This soil may require in-situ remediation. Alternatively, dependent on the nature of the ground water contaminant plume, contaminated soil below the water table may left in place to degrade naturally over time.

Ground water remediation would be the most expensive task associated with final cleanup of the site. Ground water cleanup may or may not be necessary at the subject property, primarily dependent upon orientation and extent of the plume, the type and concentration of contaminants within the plume, the presence or absence of sensitive down gradient receptors, and the physical and micro-biological characteristics of the aquifer. These are the questions that must be resolved during the course of the RI/FS. However, if a plume is confirmed to exist, minimum requirements will probably consist of a ground water monitoring program to confirm that the plume is not migrating off-site.

INDEMNIFICATION AND LIMITATIONS

The analytical results, conclusions and recommendations within this report are based on the soil samples collected from the indicated locations at the time this report was prepared, and should not be construed as a warranty of the subsurface conditions throughout the site. No environmental investigation can wholly eliminate uncertainty regarding the potential for recognized environmental conditions in connection with a property. An environmental investigation is intended to reduce, but not eliminate, uncertainty regarding the existence of recognized environmental conditions.

Within the limitations of scope, schedule and budget for our work, we warrant that our work has been done in accordance with our proposal and generally accepted environmental assessment practices followed in this area at the time the report was prepared. No other warranty, express or implied, is made.

We appreciate the opportunity to be of service to you. Should you have any questions concerning this report or require further information, please contact our office at (360)-676-9589 or (800)-859-5597.

Sincerely,

BEK ENGINEERING & ENVIRONMENTAL, INC.

Jon M. Einarsen, Ph.D., Principal
Geologist
WA UST Assessor and Decommissioning License #32-US-000684

Attach: APPENDIX I

Figure 1 - Site Vicinity Map
Figure 2 - Generalized Site Plan and Sample Locations
Figures 3 to 6 – Photographs
Release of Liability / Certificate of Disposal

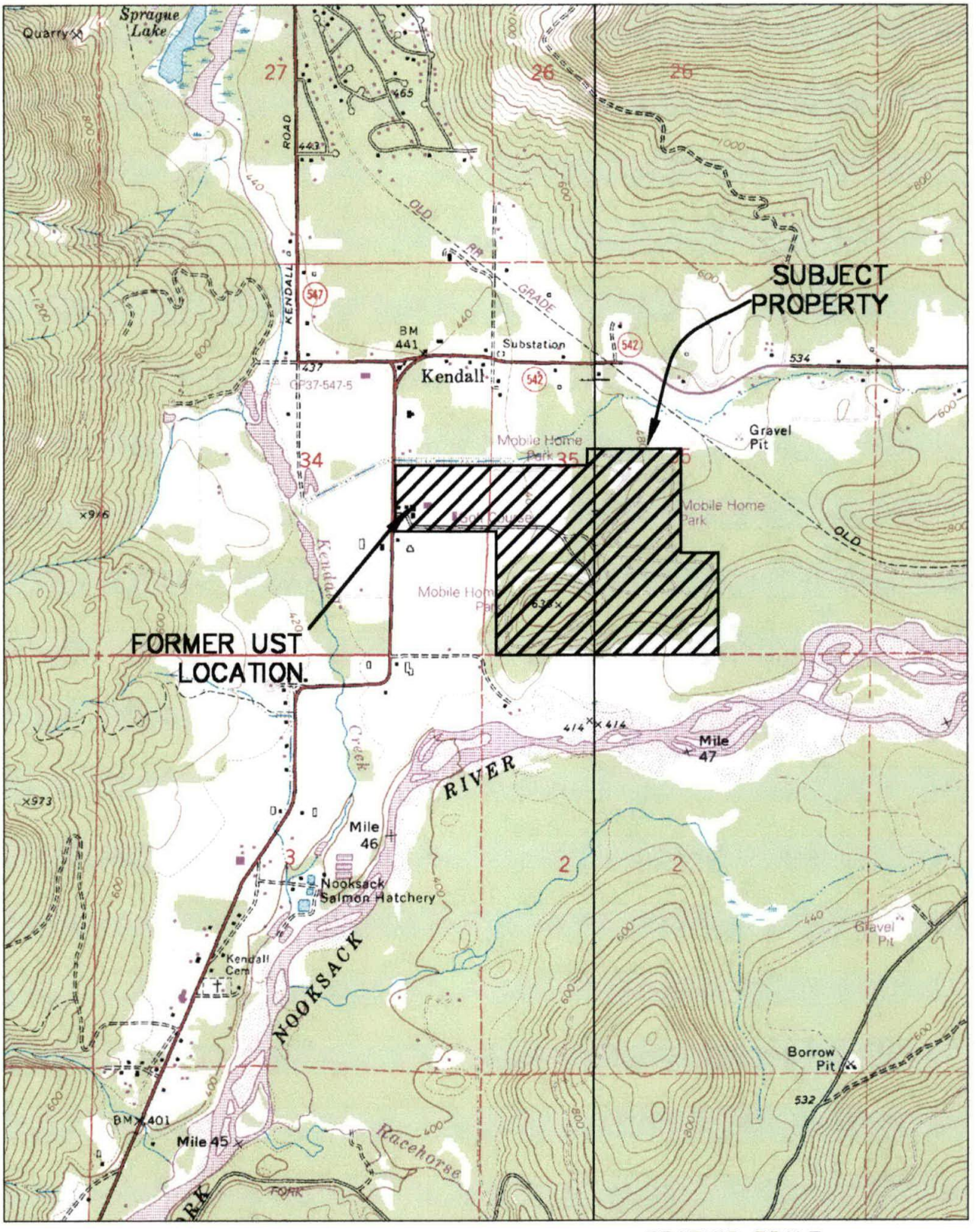
APPENDIX II

Laboratory Reports

cc: John Lillie, Washington State Department of Ecology, Voluntary Cleanup Program
Bill Angel, Whatcom County Health and Human Services

APPENDIX I

Figure 1 – Site Vicinity Map
Figure 2 – Generalized Site Plan & Sample Locations
Figures 3 to 6 – Photographs
Release of Liability / Certificate of Disposal



GRAPHIC SCALE

2000 0 2000 4000

1 INCH = 2000 FEET

REFERENCE: KENDALL QUADRANGLE (U.S.GEOLOGICAL SURVEY, 1972, REVISED 1993)
MAPLE FALLS QUADRANGLE (U.S. GEOLOGICAL SURVEY, 1972, REVISED 1994)

JOB NO.:	98235
DESIGNED BY/DRAWN BY:	JNE
CHECKED BY:	JNE
DWG FILE:	KENDALL/MAPLE FALLS

BEK ENGINEERING & ENVIRONMENTAL, INC.

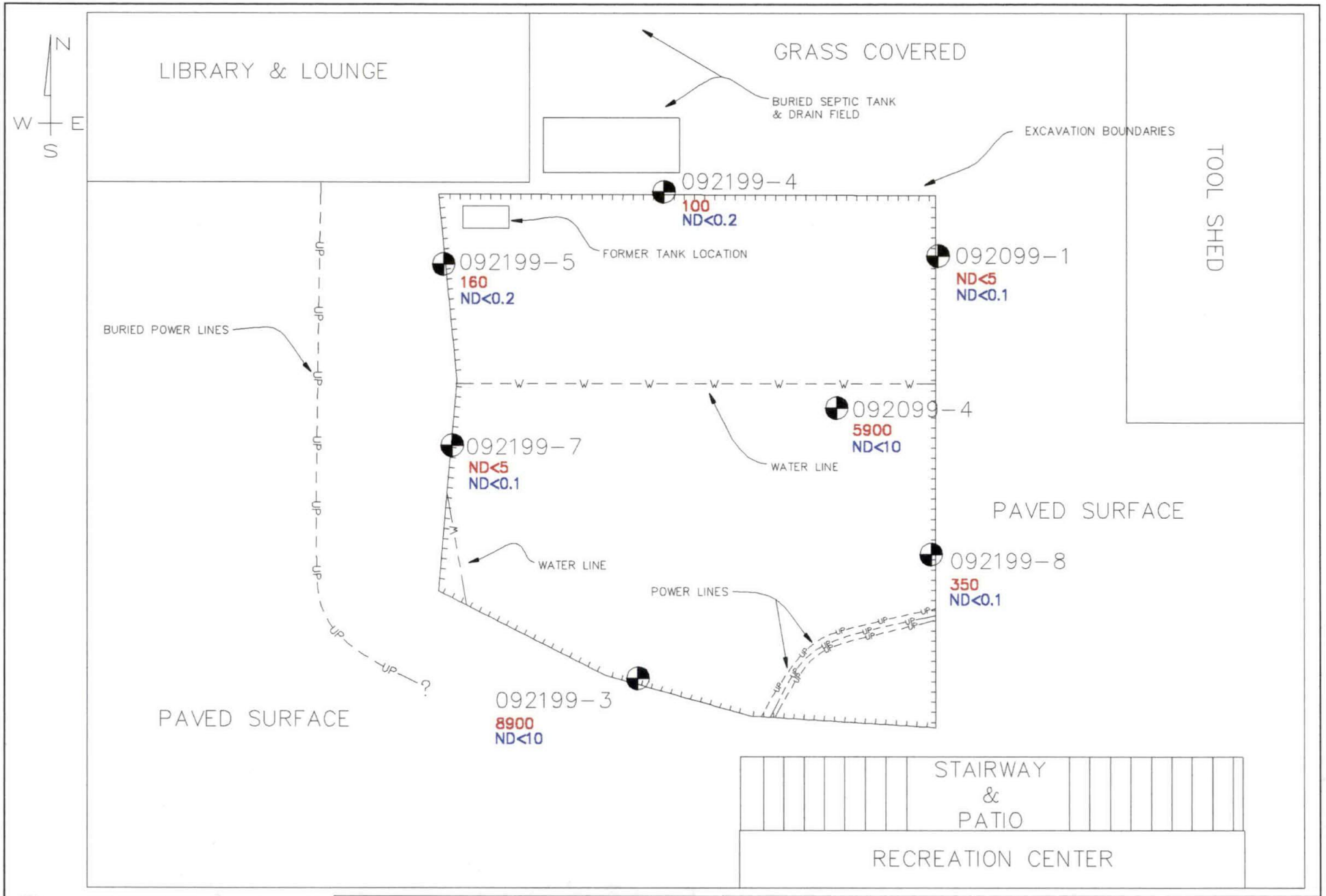
CIVIL GEOTECHNICAL ENVIRONMENTAL WETLANDS

2138 Humboldt Street
Bellingham, WA 98225
Ph: (360) 676-9589
Ph: (800) 859-5597
Fax: (360) 676-4625

FIGURE 1
SITE VICINITY MAP
BLACK MOUNTAIN RANCH

DATE: 9/99

SCALE: H: 1:24,000 V: N/A



092199-7: SAMPLE LOCATION
100: TOTAL GASOLINE IN MG/KG
ND<10: BENZENE IN MG/KG

JOB NO.:	98235
DESIGNED BY/DRAWN BY:	GTK
CHECKED BY:	JME
DWG FILE:	98235 SITE PLAN

BEK ENGINEERING & ENVIRONMENTAL, INC.

CIVIL GEOTECHNICAL ENVIRONMENTAL WETLANDS

2138 Humboldt Street
Bellingham, WA 98225
Ph: (360) 676-9589
Ph: (800) 859-5597
Fax: (360) 676-4625

FIGURE 2
GENERALIZED SITE PLAN & SAMPLE LOCATIONS
BLACK MOUNTAIN RANCH

DATE: 12/99 SCALE: H: N/A V: N/A

Figure 3. Photograph of north end of the excavation. Tank was located on the left side of the photograph. Ground water was observed at a depth of approximately 11.5 feet.

Figure 4. Photograph of excavation; view to the north. Power lines are present near the backhoe bucket.

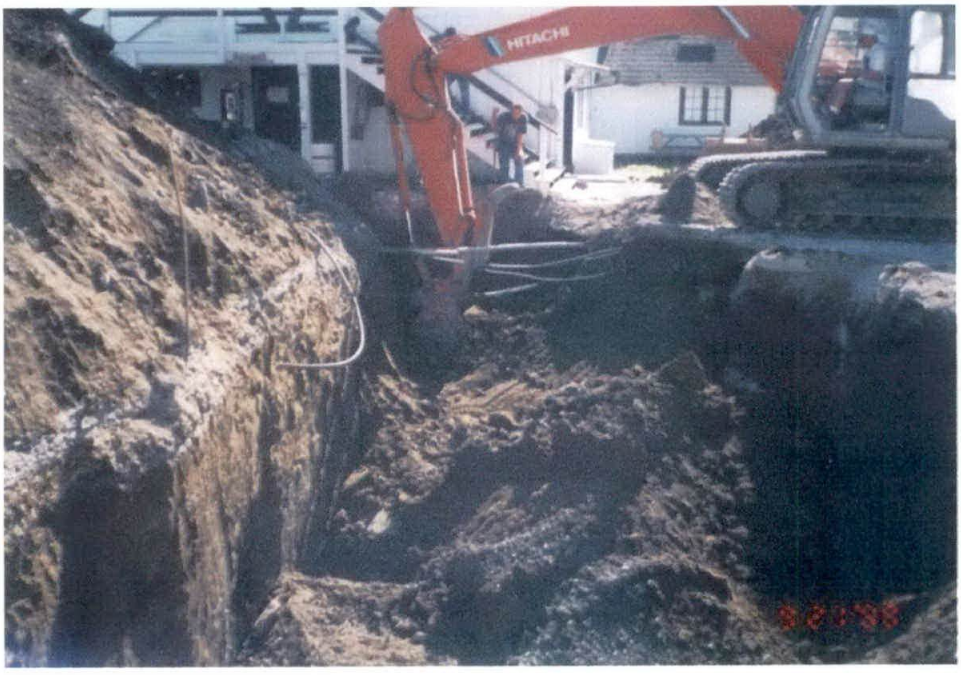


Figure 5. View of excavation looking south towards the Recreation Center.

Figure 6. View of excavation from the patio of the Recreation Center. Ground water was observed on the south end of the excavation.

CSR
Associated

Release of Liability/Certificate of Disposal

ULTRA TANK SERVICES AND THEIR CLIENT :are released from liability for all petroleum contaminated soil originating from:

BLACK MOUNTAIN RANCH,
6417 Mount Baker Highway
Deming Wa.

and transported to:

CSR - Associated Sand & Gravel Company Inc.
6300 Glenwood Ave.
Everett WA 98203

On 9/20 through 9/21/1999

A total of 270.02 tons of class 3 petroleum contaminated soil were transported to the above facility. The material was treated and disposed of in the following manner:

Thermal Desorption/Landfill for Reclamation

Treatment/Disposal of the contaminated soil was performed in accordance with all applicable federal, state, and local laws and regulations.

Signed: Date 10/08/1999

Larry W. Baker

Larry W. Baker
Operations Manager,
Soil Remediation Division

APPENDIX II

Laboratory Reports

CCI Analytical Laboratories Inc.
3225 Pine Street
Everett, WA 98201
Phone (425) 252-2620
(206) 292-9059 Seattle
(425) 259-6289 Fax

Chain of Custody
Laboratory Analysis Request

CCI Laboratory Use Only

Date 9/21/99 Page 1 Of 1

PROJECT ID: 98235 Black Mountain Ranch
REPORT TO COMPANY: BEK Engineering
PROJECT MANAGER: Jon Emerson
ADDRESS: 2138 Humboldt St.
Bellingham, WA 98225
PHONE: 360-676-7584 FAX: 360-676-4125
INVOICE TO COMPANY: BEK Engineering
ATTENTION: Jon Emerson
ADDRESS: Same
P.O. NUMBER: CCI QUOTE:

SAMPLE I.D.	DATE	TIME	TYPE	LAB#
1. 092197-5	9/21/99	11:30	Soil	
2. 092199-7	9/21/99	12:15	Soil	
3.				
4. 092099-1	9/20/99	9:30	Soil	
5. 092099-4	9/20/99	12:30	Soil	
6. 092199-3	9/21/99	9:45	Soil	
7. 092199-4	9/21/99	10:00	Soil	
8. 092199-8	9/21/99	13:00	Soil	
9.				
10.				

ANALYSIS REQUESTED

WTPH-G	WTPH-D ☐ 8015 MODIFIED ☐	WTPH-418.1	BTEX	WTPH-HCID	EPA 8020 ☐ 602 ☐	EPA 8010 ☐ 601 ☐	EPA 8240 ☐ 624 ☐ 8260 ☐	EPA 8270 ☐ 625 ☐	EPA 8080 ☐ 608 ☐ PCB only ☐ Pest only ☐	Metals Priority Pollutant ☐ RCRA ☐ TAL ☐	Metals Other (Specify)

OTHER (Specify)

TCLP Metals ☐ VOA ☐ Semi-Vol ☐ Pest ☐ Herb ☐	NWTFH-G	BTEX							NUMBER OF CONTAINERS	RECEIVED IN GOOD CONDITION?
	X	X		24	hr.	turn			1	
	X	X		24	hr.	turn			1	
	X	X								

SPECIAL INSTRUCTIONS

SIGNATURES (Name, Company, Date, and Time):

1. Relinquished By: [signature] BEK 9/21/99 15:00
Received By:
2. Relinquished By:
Received By:

TURNAROUND REQUESTED in Business Days*

Organic, Metals & Inorganic Analysis: 10 Standard | 5 | 3 | 2 | 1 | Same Day

Fuels & Hydrocarbon Analysis: 5 Standard | 3 | 1 | Same Day

OTHER:
Specify:

* Turnaround Requests less than standard may incur Rush Charges.

CCI
ANALYTICAL
LABORATORIES, INC.

CERTIFICATE OF ANALYSIS

CLIENT: BEK ENGINEERING
2138 HUMBOLDT ST.
BELLINGHAM, WA 98225

DATE: 9/23/99
CCIL JOB #: 909092
CCIL SAMPLE #: 1
DATE RECEIVED: 9/22/99
WDOE ACCREDITATION #: C142

CLIENT CONTACT: JON EINARSEN

CLIENT PROJECT ID: 98235 BLACK MOUNTAIN RANCH
CLIENT SAMPLE ID: 092199-5 9/21/99 11:30

DATA RESULTS

ANALYTE	METHOD	RESULTS*	UNITS**	ACTION LEVEL***	ANALYSIS DATE	ANALYSIS BY
TPH-VOLATILE RANGE	NWTPH-GX	160	MG/KG		9/22/99	LAH
BENZENE	EPA-8021	ND(<0.2)	MG/KG	.5MG/KG	9/22/99	LAH
TOLUENE	EPA-8021	ND(<0.2)	MG/KG	40MG/KG	9/22/99	LAH
ETHYLBENZENE	EPA-8021	0.3	MG/KG	20MG/KG	9/22/99	LAH
XYLENES	EPA-8021	ND(<0.6)	MG/KG	20MG/KG	9/22/99	LAH

NOTE: CHROMATOGRAM INDICATES SAMPLE CONTAINS PRODUCT WHICH IS LIKELY DIESEL OR HIGHLY WEATHERED GASOLINE

* "ND" INDICATES ANALYTE ANALYZED FOR BUT NOT DETECTED AT CONCENTRATION ABOVE REPORTING LIMIT. REPORTING LIMIT IS GIVEN IN PARENTHESES OR AS FOLL(GASOLINE(VOLATILE RANGE) REPORTING LIMIT IS 5 MG/KG

** UNITS FOR ALL NON LIQUID SAMPLES ARE REPORTED ON A DRY WEIGHT BASIS

*** ACTIONS LEVELS ARE PROVIDED ONLY WHEN PARAMETER DATA IS USED FOR A GENERALLY CONSISTENT APPLICATION. WHEN PROVIDED, THEY SHOULD BE USED AS GUIDELINES ONLY. THE APPROPRIATE REGULATORY DOCUMENT SHOULD BE CONSULTED BEFORE MAKING ANY DECISIONS BASED ON ANALYTICAL DATA

APPROVED BY: _____

3229 Pine St. • Everett, WA 98201 • 425 252-2620 • FAX 425 259-6289 • Seattle 206 292-9059

CCI
ANALYTICAL
LABORATORIES, INC.

CERTIFICATE OF ANALYSIS

CLIENT: BEK ENGINEERING
2138 HUMBOLDT ST.
BELLINGHAM, WA 98225

DATE: 9/23/99
CCIL JOB #: 909092
CCIL SAMPLE #: 2
DATE RECEIVED: 9/22/99
WDOE ACCREDITATION #: C142

CLIENT CONTACT: JON EINARSEN

CLIENT PROJECT ID: 98235 BLACK MOUNTAIN RANCH
CLIENT SAMPLE ID: 092199-7 9/21/99 12:15

DATA RESULTS

ANALYTE	METHOD	RESULTS*	UNITS**	ACTION LEVEL***	ANALYSIS DATE	ANALYSIS BY
TPH-VOLATILE RANGE	NWTPH-GX	ND	MG/KG		9/22/99	LAH
BENZENE	EPA-8021	ND(<0.1)	MG/KG	.5MG/KG	9/22/99	LAH
TOLUENE	EPA-8021	ND(<0.1)	MG/KG	40MG/KG	9/22/99	LAH
ETHYLBENZENE	EPA-8021	ND(<0.1)	MG/KG	20MG/KG	9/22/99	LAH
XYLENES	EPA-8021	ND(<0.3)	MG/KG	20MG/KG	9/22/99	LAH

* "ND" INDICATES ANALYTE ANALYZED FOR BUT NOT DETECTED AT CONCENTRATION ABOVE REPORTING LIMIT. REPORTING LIMIT IS GIVEN IN PARENTHESES OR AS FOLL(
GASOLINE(VOLATILE RANGE) REPORTING LIMIT IS 5 MG/KG

** UNITS FOR ALL NON LIQUID SAMPLES ARE REPORTED ON A DRY WEIGHT BASIS

*** ACTIONS LEVELS ARE PROVIDED ONLY WHEN PARAMETER DATA IS USED FOR A GENERALLY CONSISTENT APPLICATION. WHEN PROVIDED, THEY SHOULD BE USED AS GUIDELINES ONLY. THE APPROPRIATE REGULATORY DOCUMENT SHOULD BE CONSULTED BEFORE MAKING ANY DECISIONS BASED ON ANALYTICAL DATA

APPROVED BY: CVA

3229 Pine St. • Everett, WA 98201 • 425 252-2620 • FAX 425 259-6289 • Seattle 206 292-9059

CCI
ANALYTICAL
LABORATORIES, INC.

CERTIFICATE OF ANALYSIS

CLIENT: BEK ENGINEERING
2138 HUMBOLDT ST.
BELLINGHAM, WA 98225

DATE: 9/29/99
CCIL JOB #: 909092
CCIL SAMPLE #: 3
DATE RECEIVED: 9/22/99
WDOE ACCREDITATION #: C142

CLIENT CONTACT: JON EINARSEN

CLIENT PROJECT ID: 98235 BLACK MOUNTAIN RANCH
CLIENT SAMPLE ID: 092099-1 9/20/99 9:30

DATA RESULTS

ANALYTE	METHOD	RESULTS*	UNITS**	ACTION LEVEL***	ANALYSIS DATE	ANALYSIS BY
TPH-VOLATILE RANGE	NWTPH-GX	ND	MG/KG		9/28/99	LAH
BENZENE	EPA-8021	ND(<0.1)	MG/KG	.5MG/KG	9/28/99	LAH
TOLUENE	EPA-8021	ND(<0.1)	MG/KG	40MG/KG	9/28/99	LAH
ETHYLBENZENE	EPA-8021	ND(<0.1)	MG/KG	20MG/KG	9/28/99	LAH
XYLENES	EPA-8021	ND(<0.3)	MG/KG	20MG/KG	9/28/99	LAH

* "ND" INDICATES ANALYTE ANALYZED FOR BUT NOT DETECTED AT CONCENTRATION ABOVE REPORTING LIMIT. REPORTING LIMIT IS GIVEN IN PARENTHESES OR AS FOLLOWS:
GASOLINE(VOLATILE RANGE) REPORTING LIMIT IS 5 MG/KG

** UNITS FOR ALL NON LIQUID SAMPLES ARE REPORTED ON A DRY WEIGHT BASIS

*** ACTIONS LEVELS ARE PROVIDED ONLY WHEN PARAMETER DATA IS USED FOR A GENERALLY CONSISTENT APPLICATION. WHEN PROVIDED, THEY SHOULD BE USED AS GUIDELINES ONLY. THE APPROPRIATE REGULATORY DOCUMENT SHOULD BE CONSULTED BEFORE MAKING ANY DECISIONS BASED ON ANALYTICAL DATA

APPROVED BY: _____

3229 Pine St. • Everett, WA 98201 • 425 252-2620 • FAX 425 259-6289 • Seattle 206 292-9059

CCI
ANALYTICAL
LABORATORIES, INC.

CERTIFICATE OF ANALYSIS

CLIENT: BEK ENGINEERING
2138 HUMBOLDT ST.
BELLINGHAM, WA 98225

DATE: 9/29/99
CCIL JOB #: 909092
CCIL SAMPLE #: 4
DATE RECEIVED: 9/22/99
WDOE ACCREDITATION #: C142

CLIENT CONTACT: JON EINARSEN

CLIENT PROJECT ID: 98235 BLACK MOUNTAIN RANCH
CLIENT SAMPLE ID: 092099-4 9/20/99 12:30

DATA RESULTS

ANALYTE	METHOD	RESULTS*	UNITS**	ACTION LEVEL***	ANALYSIS DATE	ANALYSIS BY
TPH-VOLATILE RANGE	NWTPH-GX	5900	MG/KG		9/29/99	LAH
BENZENE	EPA-8021	ND(<10)	MG/KG	.5MG/KG	9/29/99	LAH
TOLUENE	EPA-8021	ND(<10)	MG/KG	40MG/KG	9/29/99	LAH
ETHYLBENZENE	EPA-8021	ND(<10)	MG/KG	20MG/KG	9/29/99	LAH
XYLENES	EPA-8021	37	MG/KG	20MG/KG	9/29/99	LAH

NOTE: CHROMATOGRAM INDICATES SAMPLE CONTAINS PRODUCT WHICH IS LIKELY LIGHTLY WEATHERED GASOLINE.

* "ND" INDICATES ANALYTE ANALYZED FOR BUT NOT DETECTED AT CONCENTRATION ABOVE REPORTING LIMIT. REPORTING LIMIT IS GIVEN IN PARENTHESES OR AS FOLLOWS: GASOLINE(VOLATILE RANGE) REPORTING LIMIT IS 5 MG/KG

** UNITS FOR ALL NON LIQUID SAMPLES ARE REPORTED ON A DRY WEIGHT BASIS

*** ACTIONS LEVELS ARE PROVIDED ONLY WHEN PARAMETER DATA IS USED FOR A GENERALLY CONSISTENT APPLICATION. WHEN PROVIDED, THEY SHOULD BE USED AS GUIDELINES ONLY. THE APPROPRIATE REGULATORY DOCUMENT SHOULD BE CONSULTED BEFORE MAKING ANY DECISIONS BASED ON ANALYTICAL DATA

APPROVED BY: CNJ

3229 Pine St. • Everett, WA 98201 • 425 252-2620 • FAX 425 259-6289 • Seattle 206 292-9059

CCI
ANALYTICAL
LABORATORIES, INC.

CERTIFICATE OF ANALYSIS

CLIENT: BEK ENGINEERING
2138 HUMBOLDT ST.
BELLINGHAM, WA 98225

DATE: 9/29/99
CCIL JOB #: 909092
CCIL SAMPLE #: 5
DATE RECEIVED: 9/22/99
WDOE ACCREDITATION #: C142

CLIENT CONTACT: JON EINARSEN

CLIENT PROJECT ID: 98235 BLACK MOUNTAIN RANCH
CLIENT SAMPLE ID: 092199-3 9/21/99 9:45

DATA RESULTS

ANALYTE	METHOD	RESULTS*	UNITS**	ACTION LEVEL***	ANALYSIS DATE	ANALYSIS BY
TPH-VOLATILE RANGE	NWTPH-GX	8900	MG/KG		9/29/99	LAH
BENZENE	EPA-8021	ND(<10)	MG/KG	.5MG/KG	9/29/99	LAH
TOLUENE	EPA-8021	ND(<10)	MG/KG	40MG/KG	9/29/99	LAH
ETHYLBENZENE	EPA-8021	41	MG/KG	20MG/KG	9/29/99	LAH
XYLENES	EPA-8021	230	MG/KG	20MG/KG	9/29/99	LAH

NOTE: CHROMATOGRAM INDICATES SAMPLE CONTAINS PRODUCT WHICH IS LIKELY LIGHTLY WEATHERED GASOLINE.

* "ND" INDICATES ANALYTE ANALYZED FOR BUT NOT DETECTED AT CONCENTRATION ABOVE REPORTING LIMIT. REPORTING LIMIT IS GIVEN IN PARENTHESES OR AS FOLI
GASOLINE(VOLATILE RANGE) REPORTING LIMIT IS 5 MG/KG

** UNITS FOR ALL NON LIQUID SAMPLES ARE REPORTED ON A DRY WEIGHT BASIS

*** ACTIONS LEVELS ARE PROVIDED ONLY WHEN PARAMETER DATA IS USED FOR A GENERALLY CONSISTENT APPLICATION. WHEN PROVIDED, THEY SHOULD BE USED AS GUIDELINES ONLY. THE APPROPRIATE REGULATORY DOCUMENT SHOULD BE CONSULTED BEFORE MAKING ANY DECISIONS BASED ON ANALYTICAL DATA

APPROVED BY: _____

3229 Pine St. • Everett, WA 98201 • 425 252-2620 • FAX 425 259-6289 • Seattle 206 292-9059

CCI
ANALYTICAL
LABORATORIES, INC.

CERTIFICATE OF ANALYSIS

CLIENT: BEK ENGINEERING
2138 HUMBOLDT ST.
BELLINGHAM, WA 98225

DATE: 9/29/99
CCIL JOB #: 909092
CCIL SAMPLE #: 6
DATE RECEIVED: 9/22/99
WDOE ACCREDITATION #: C142

CLIENT CONTACT: JON EINARSEN

CLIENT PROJECT ID: 98235 BLACK MOUNTAIN RANCH
CLIENT SAMPLE ID: 092199-4 9/21/99 10:00

DATA RESULTS

ANALYTE	METHOD	RESULTS*	UNITS**	ACTION LEVEL***	ANALYSIS DATE	ANALYSIS BY
TPH-VOLATILE RANGE	NWTPH-GX	100	MG/KG		9/28/99	LAH
BENZENE	EPA-8021	ND(<0.2)	MG/KG	.5MG/KG	9/28/99	LAH
TOLUENE	EPA-8021	ND(<0.2)	MG/KG	40MG/KG	9/28/99	LAH
ETHYLBENZENE	EPA-8021	0.4	MG/KG	20MG/KG	9/28/99	LAH
XYLENES	EPA-8021	ND(<0.6)	MG/KG	20MG/KG	9/28/99	LAH

NOTE: CHROMATOGRAM INDICATES SAMPLE CONTAINS PRODUCT WHICH IS LIKELYLIGHTLY WEATHERED GASOLINE.

* "ND" INDICATES ANALYTE ANALYZED FOR BUT NOT DETECTED AT CONCENTRATION ABOVE REPORTING LIMIT. REPORTING LIMIT IS GIVEN IN PARENTHESES OR AS FOLI GASOLINE(VOLATILE RANGE) REPORTING LIMIT IS 5 MG/KG

** UNITS FOR ALL NON LIQUID SAMPLES ARE REPORTED ON A DRY WEIGHT BASIS

*** ACTIONS LEVELS ARE PROVIDED ONLY WHEN PARAMETER DATA IS USED FOR A GENERALLY CONSISTENT APPLICATION. WHEN PROVIDED, THEY SHOULD BE USED AS GUIDELINES ONLY. THE APPROPRIATE REGULATORY DOCUMENT SHOULD BE CONSULTED BEFORE MAKING ANY DECISIONS BASED ON ANALYTICAL DATA

APPROVED BY: _____

3229 Pine St. • Everett, WA 98201 • 425 252-2620 • FAX 425 259-6289 • Seattle 206 292-9059

CCI
ANALYTICAL
LABORATORIES, INC.

CERTIFICATE OF ANALYSIS

CLIENT: BEK ENGINEERING
2138 HUMBOLDT ST.
BELLINGHAM, WA 98225

DATE: 9/29/99
CCIL JOB #: 909092
CCIL SAMPLE #: 7
DATE RECEIVED: 9/22/99
WDOE ACCREDITATION #: C142

CLIENT CONTACT: JON EINARSEN

CLIENT PROJECT ID: 98235 BLACK MOUNTAIN RANCH
CLIENT SAMPLE ID: 092199-8 9/21/99 13:00

DATA RESULTS

ANALYTE	METHOD	RESULTS*	UNITS**	ACTION LEVEL***	ANALYSIS DATE	ANALYSIS BY
TPH-VOLATILE RANGE	NWTPH-GX	350	MG/KG		9/29/99	LAH
BENZENE	EPA-8021	ND(<0.1)	MG/KG	.5MG/KG	9/28/99	LAH
TOLUENE	EPA-8021	0.5	MG/KG	40MG/KG	9/28/99	LAH
ETHYLBENZENE	EPA-8021	0.7	MG/KG	20MG/KG	9/28/99	LAH
XYLENES	EPA-8021	1.3	MG/KG	20MG/KG	9/28/99	LAH

NOTE: CHROMATOGRAM INDICATES SAMPLE CONTAINS PRODUCT WHICH IS LIKELY LIGHTLY WEATHERED GASOLINE.

* "ND" INDICATES ANALYTE ANALYZED FOR BUT NOT DETECTED AT CONCENTRATION ABOVE REPORTING LIMIT. REPORTING LIMIT IS GIVEN IN PARENTHESES OR AS FOLI
GASOLINE(VOLATILE RANGE) REPORTING LIMIT IS 5 MG/KG

** UNITS FOR ALL NON LIQUID SAMPLES ARE REPORTED ON A DRY WEIGHT BASIS

*** ACTIONS LEVELS ARE PROVIDED ONLY WHEN PARAMETER DATA IS USED FOR A GENERALLY CONSISTENT APPLICATION. WHEN PROVIDED, THEY SHOULD BE USED AS GUIDELINES ONLY. THE APPROPRIATE REGULATORY DOCUMENT SHOULD BE CONSULTED BEFORE MAKING ANY DECISIONS BASED ON ANALYTICAL DATA

APPROVED BY: _____

3229 Pine St. • Everett, WA 98201 • 425 252-2620 • FAX 425 259-6289 • Seattle 206 292-9059

CCI
ANALYTICAL
LABORATORIES, INC.

CERTIFICATE OF ANALYSIS

CLIENT: BEK ENGINEERING
2138 HUMBOLDT ST.
BELLINGHAM, WA 98225

DATE: 9/29/99
CCIL JOB #: 909092

DATE RECEIVED: 9/22/99
WDOE ACCREDITATION #: C142

CLIENT CONTACT: JON EINARSEN

CLIENT PROJECT ID: 98235 BLACK MOUNTAIN RANCH

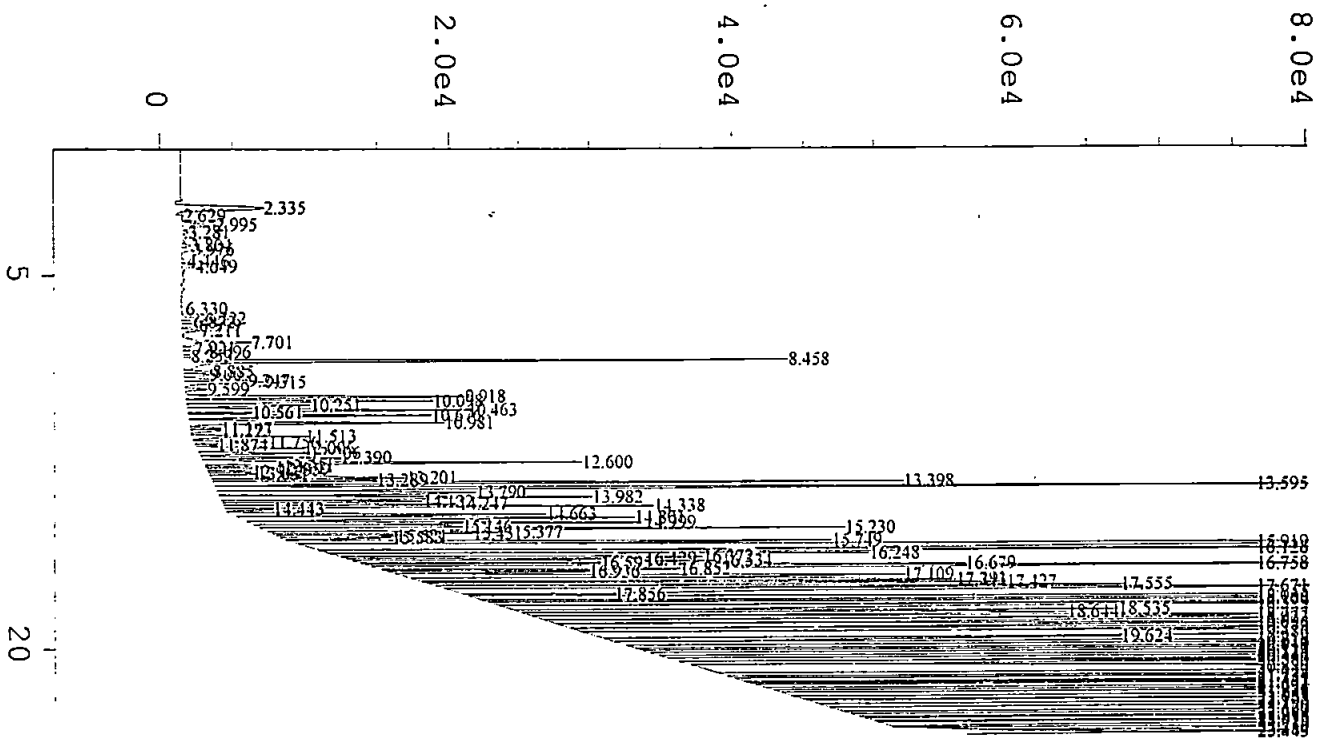
QUALITY CONTROL RESULTS

SURROGATE RECOVERY

CCIL SAMPLE ID	ANALYTE	SUR ID	% RECV
909092-01	NWTPH-GX	TFT	88
909092-01	EPA-8021	TFT	99
909092-02	NWTPH-GX	TFT	81
909092-02	EPA-8021	TFT	84
909092-03	NWTPH-GX	TFT	62
909092-03	EPA-8021	TFT	66
909092-04	NWTPH-GX	TFT	*
909092-04	EPA-8021	TFT	*
909092-05	NWTPH-GX	TFT	*
909092-05	EPA-8021	TFT	*
909092-06	NWTPH-GX	TFT	76
909092-06	EPA-8021	TFT	78
909092-07	NWTPH-GX	TFT	85
909092-07	EPA-8021	TFT	84

APPROVED BY: _____

3229 Pine St. • Everett, WA 98201 • 425 252-2620 • FAX 425 259-6289 • Seattle 206 292-9059



External Standard Report

Data File Name	: D:\HPCHEM\2\DATA\29092201\021R0201.D		
Operator	: LAH	Page Number	: 1
Instrument	: GAS/BTEX	Vial Number	: 21
Sample Name	: 909094-1 50UL	Injection Number	: 1
Run Time Bar Code:		Sequence Line	: 2
Acquired on	: 22 Sep 99 08:43 PM	Instrument Method	: TPHG0999.MTH
Report Created on	: 22 Sep 99 09:07 PM	Analysis Method	: BTEX0999.MTH
Last Recalib on	: 07 SEP 99 08:38 AM	Sample Amount	: 0
Multiplier	: 1	ISTD Amount	:

Sig. 2 in D:\HPCHEM\2\DATA\29092201\021R0201.D

Ret Time	Area	Type	Width	Ref#	ug/l	Name
6.722	9845	VV	0.092	1	0.0689	Benzene
8.458	215452	VV	0.077	1	4.955	TFT surrogate %Z = 99 [illegible]
10.463	110024	VV	0.080	1	0.823	Toluene
13.398 13.376	234895	VV	0.073	1	2.195	Ethylbenzene
13.595	425958	VV	0.069	1	1.591	M+P-Xylene
14.247	77246	VV	0.067	1	0.410	O-Xylene

B, T < 0.2 mg/kg

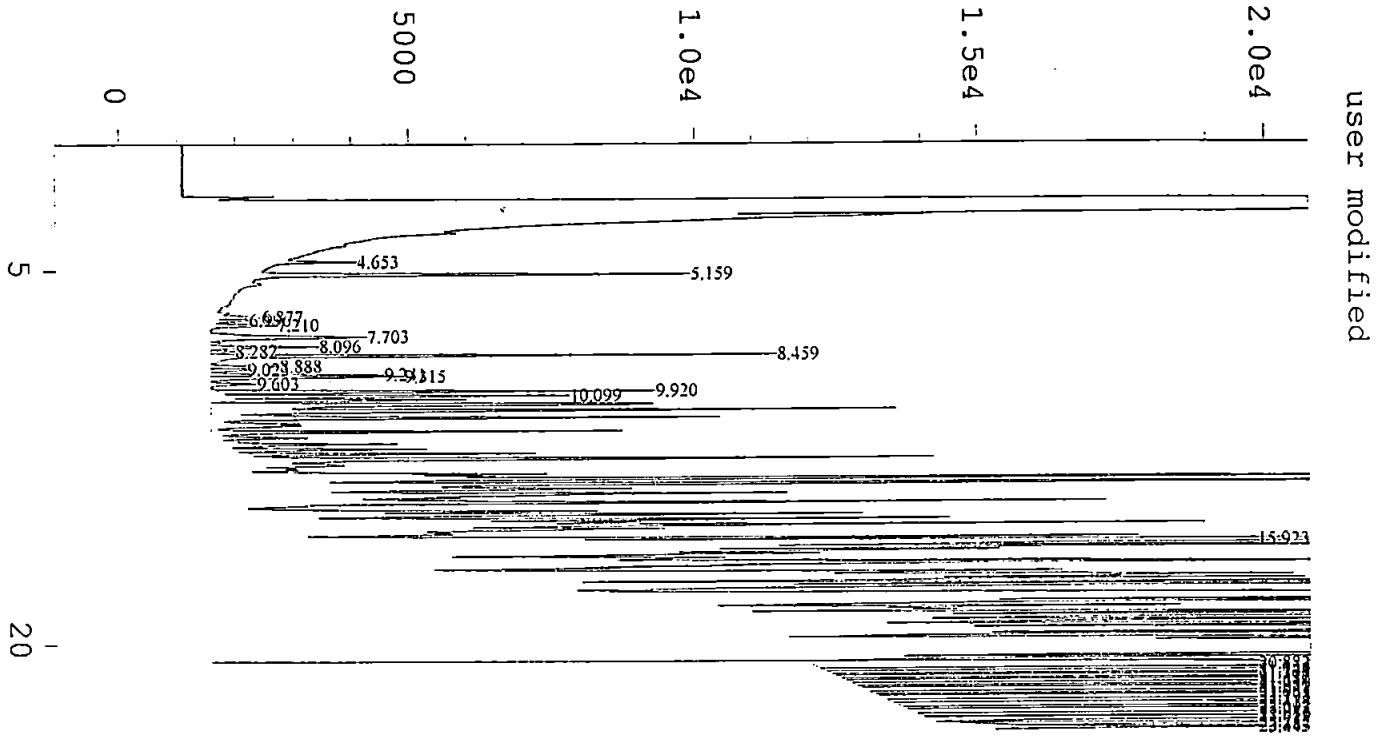
Dry wt = 6.31g

E = 2.195 ug/L x 5mL/0.05 x 0.01/6.31g = 0.35 mg/kg

X < 0.6 mg/kg

9.23.99

9-23-99 LH



==========

External Standard Report

==========

Data File Name : D:\HPCHEM\2\DATA\29092201\021F0201.D
Operator : LAH
Instrument : GAS/BTEX
Sample Name : 909094-1 50UL
Run Time Bar Code:
Acquired on : 22 Sep 99 08:43 PM
Report Created on: 23 Sep 99 08:30 AM
Last Recalib on : 14 SEP 99 09:24 AM
Multiplier : 1

Page Number : 1
Vial Number : 21
Injection Number : 1
Sequence Line : 2
Instrument Method: TPHG0999.MTH
Analysis Method : TPHG0999.MTH
Sample Amount : 0
ISTD Amount :

Sig. 1 in D:\HPCHEM\2\DATA\29092201\021F0201.D

Ret Time	Area	Type	Width	Ref#	ug/l	Name
8.459	48283	VV	0.075	1	4.381	TFT-surrogate %Z = 8.762 ÷ 10 x 100 = 88%
15.923	6978513	MM	2.026	1	1037.031	gasoline envelop

User Modified

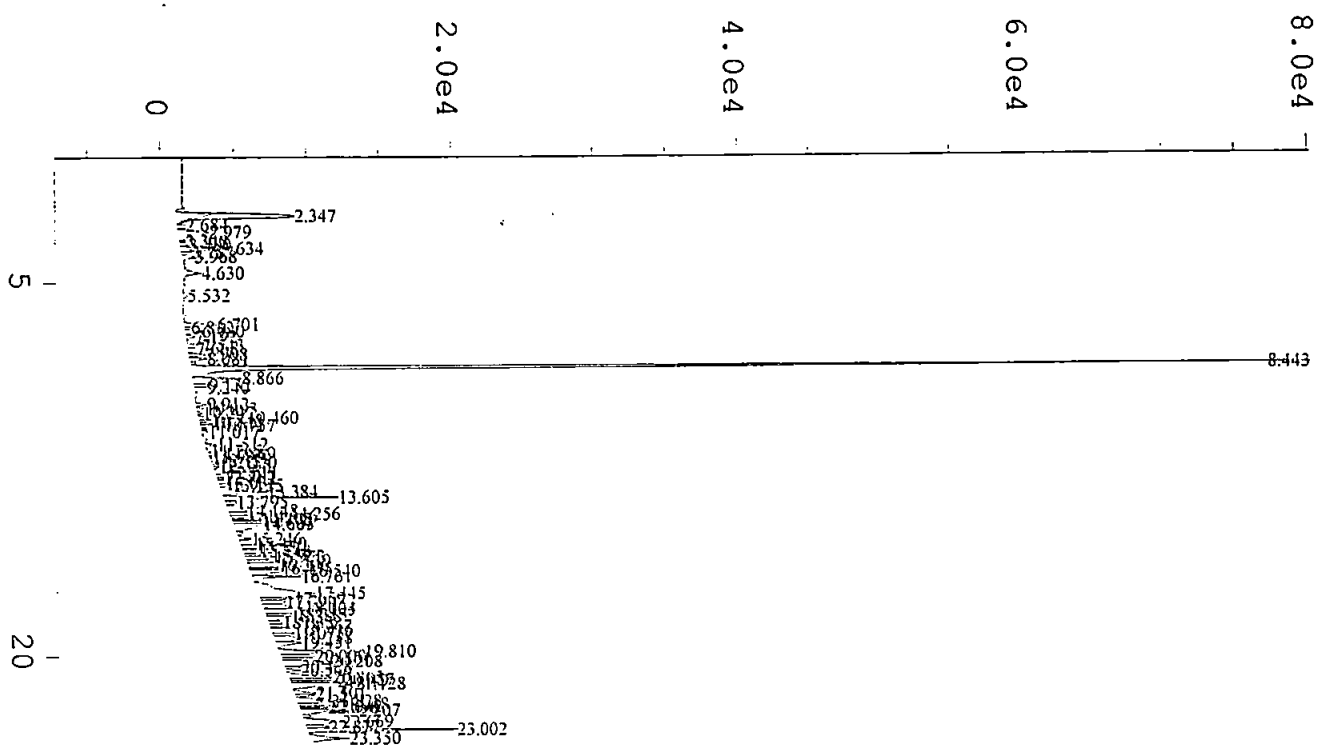
==========

Gas 1037.031 µg/L x 5mL / 0.05mL x 0.01L / 0.31g = 166 mg/kg

Diesel or
extremely weathered gasoline

9-23-99

9-23-99 LH



External Standard Report

Data File Name : D:\HPCHEM\2\DATA\29092201\022R0201.D
Operator : LAH
Instrument : GAS/BTEX
Sample Name : 909094-2 100UL
Run Time Bar Code:
Acquired on : 22 Sep 99 09:14 PM
Report Created on: 22 Sep 99 09:38 PM
Last Recalib on : 07 SEP 99 08:38 AM
Multiplier : 1

Page Number : 1
Vial Number : 22
Injection Number : 1
Sequence Line : 2
Instrument Method: TPHG0999.MTH
Analysis Method : BTEX0999.MTH
Sample Amount : 0
ISTD Amount :

Sig. 2 in D:\HPCHEM\2\DATA\29092201\022R0201.D

Ret Time	Area	Type	Width	Ref#	ug/l	Name
6.701	12086	VV	0.083	1	0.0845	Benzene
8.443	384760	VV	0.074	1	8.417	TFT surrogate 10X100=84%
10.460	14455	PV	0.065	1	0.108	Toluene
13.384	21796	VV	0.098	1	0.184	Ethylbenzene
13.605	37638	VV	0.071	1	0.141	M+P-Xylene
14.256	21188	VV	0.073	1	0.112	O-Xylene

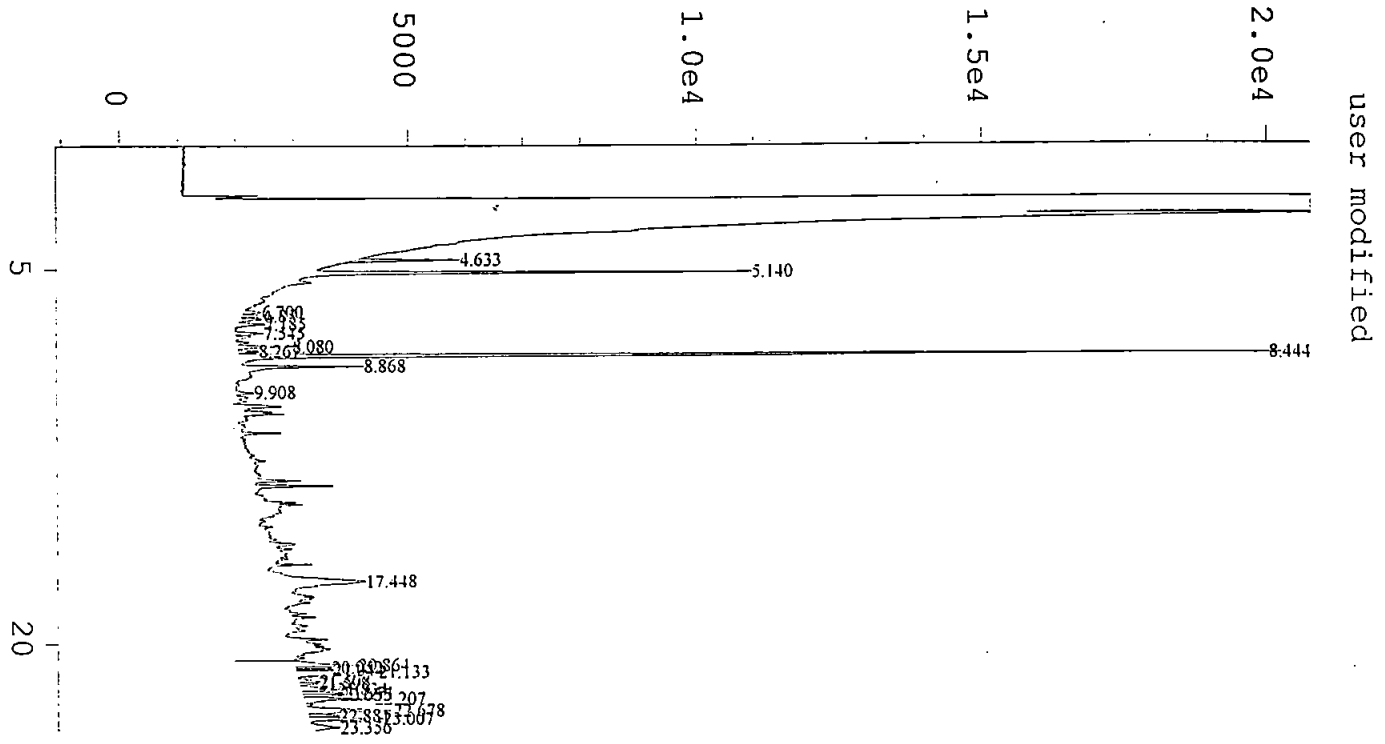
BTE < 0.1 mg/kg

X < 0.3 mg/kg

Dry wt = 6.91g

9-23-99

9-23-99 LH



External Standard Report

Data File Name : D:\HPCHEM\2\DATA\29092201\022F0201.D
Operator : LAH
Instrument : GAS/BTEX
Sample Name : 909094-2 100UL
Run Time Bar Code:
Acquired on : 22 Sep 99 09:14 PM
Report Created on: 23 Sep 99 08:31 AM
Last Recalib on : 14 SEP 99 09:24 AM
Multiplier : 1

Page Number : 1
Vial Number : 22
Injection Number : 1
Sequence Line : 2
Instrument Method: TPHG0999.MT
Analysis Method : TPHG0999.MT
Sample Amount : 0
ISTD Amount :

Sig. 1 in D:\HPCHEM\2\DATA\29092201\022F0201.D

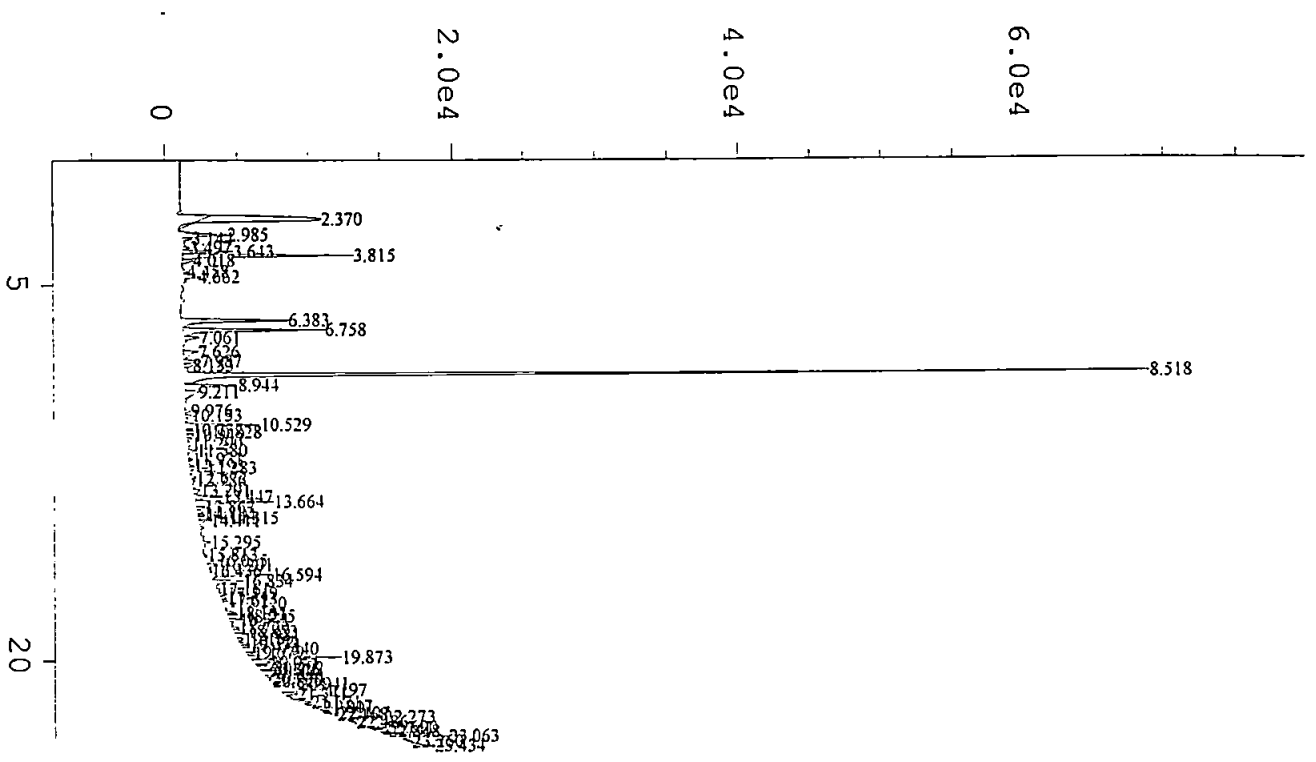
Ret Time	Area	Type	Width	Ref#	ug/l	Name
8.444	86267	PV	0.073	1	8.066	TFT-surrogate 10X100=81%
17.448	470464	MM	3.430	1	48.684	gasoline envelop

User Modified

Gas <5.0 mg/kg

9-23-99

9-23-99LH



==========

External Standard Report

==========

Data File Name : D:\HPCHEM\2\DATA\29092801\021R0301.D
Operator : LAH
Instrument : GAS/BTEX
Sample Name : 909092-3 100UL
Run Time Bar Code:
Acquired on : 28 Sep 99 10:15 PM
Report Created on: 28 Sep 99 10:38 PM
Last Recalib on : 18 AUG 99 01:03 PM
Multiplier : 1

Page Number : 1
Vial Number : 21
Injection Number : 1
Sequence Line : 3
Instrument Method: TPHG0999.MTH
Analysis Method : BTEX2899.MTH
Sample Amount : 0
ISTD Amount :

Sig. 2 in D:\HPCHEM\2\DATA\29092801\021R0301.D

Ret Time	Area	Type	Width	Ref#	ug/l	Name
6.758	60875	VV	0.092	1	0.311	Benzene
8.518	334942	VV	0.075	1	6.584	TFT surrogate ÷ 10 x 100 = 66%
10.529	25072	PV	0.069	1	0.126	Toluene
13.447	11669	VV	0.087	1	0.0722	Ethylbenzene
13.664	30471	VV	0.080	1	0.123	M+P-Xylene
14.194	2110	VV	0.058	1	0.0117	O-Xylene

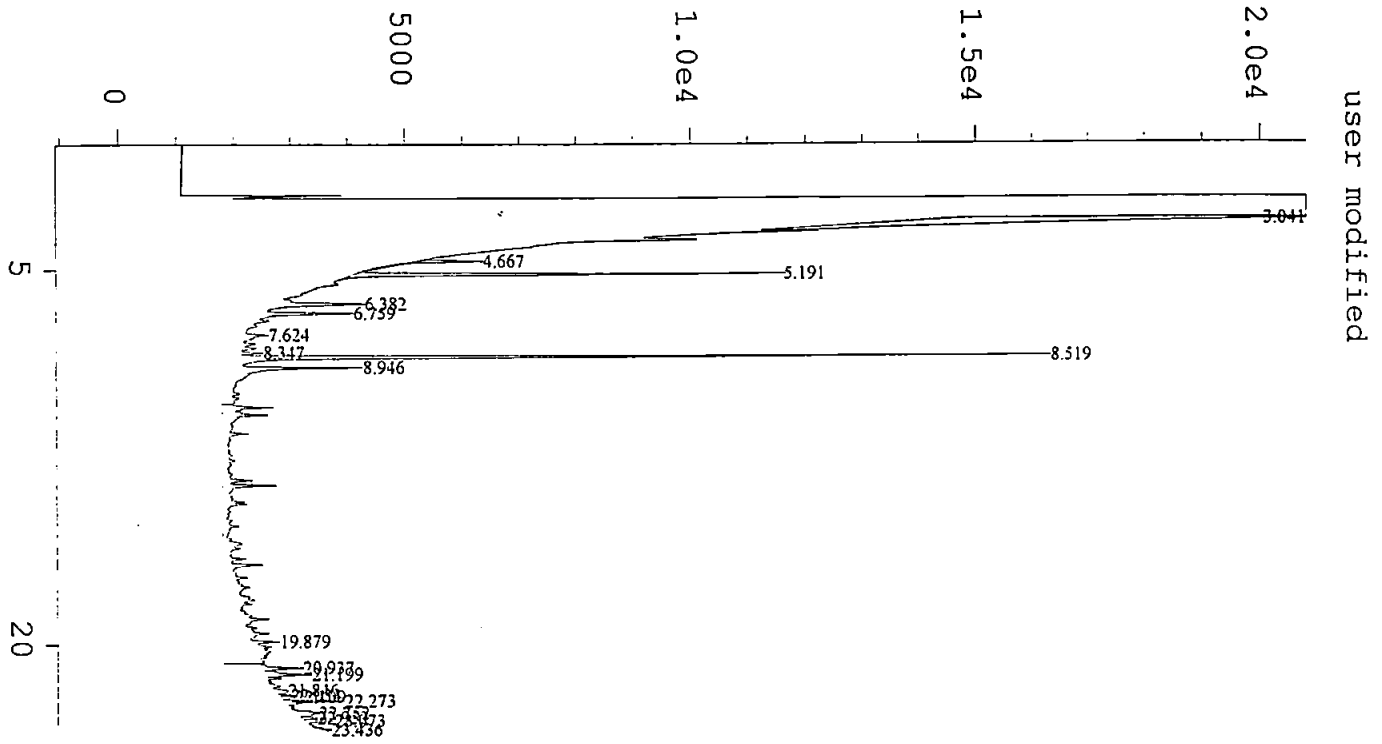
==========

BTE < 0.1 mg/kg

X < 0.3 mg/kg

Dry wt = 4.5

9-29-99



==========

External Standard Report

==========

Data File Name : D:\HPCHEM\2\DATA\29092801\021F0301.D
Operator : LAH
Instrument : GAS/BTEX
Sample Name : 909092-3 100UL
Run Time Bar Code:
Acquired on : 28 Sep 99 10:15 PM
Report Created on: 29 Sep 99 08:45 AM
Last Recalib on : 14 SEP 99 09:24 AM
Multiplier : 1

Page Number : 1
Vial Number : 21
Injection Number : 1
Sequence Line : 3
Instrument Method: TPHG0999.MTH
Analysis Method : TPHG0999.MTH
Sample Amount : 0
ISTD Amount :

Sig. 1 in D:\HPCHEM\2\DATA\29092801\021F0301.D

Ret Time	Area	Type	Width	Ref#	ug/l	Name
8.519	67637	VV	0.072	1	6.233	TFT-surrogate 6.0×100=62%
19.879	189194	MM	3.162	1	19.578	gasoline envelop

User Modified

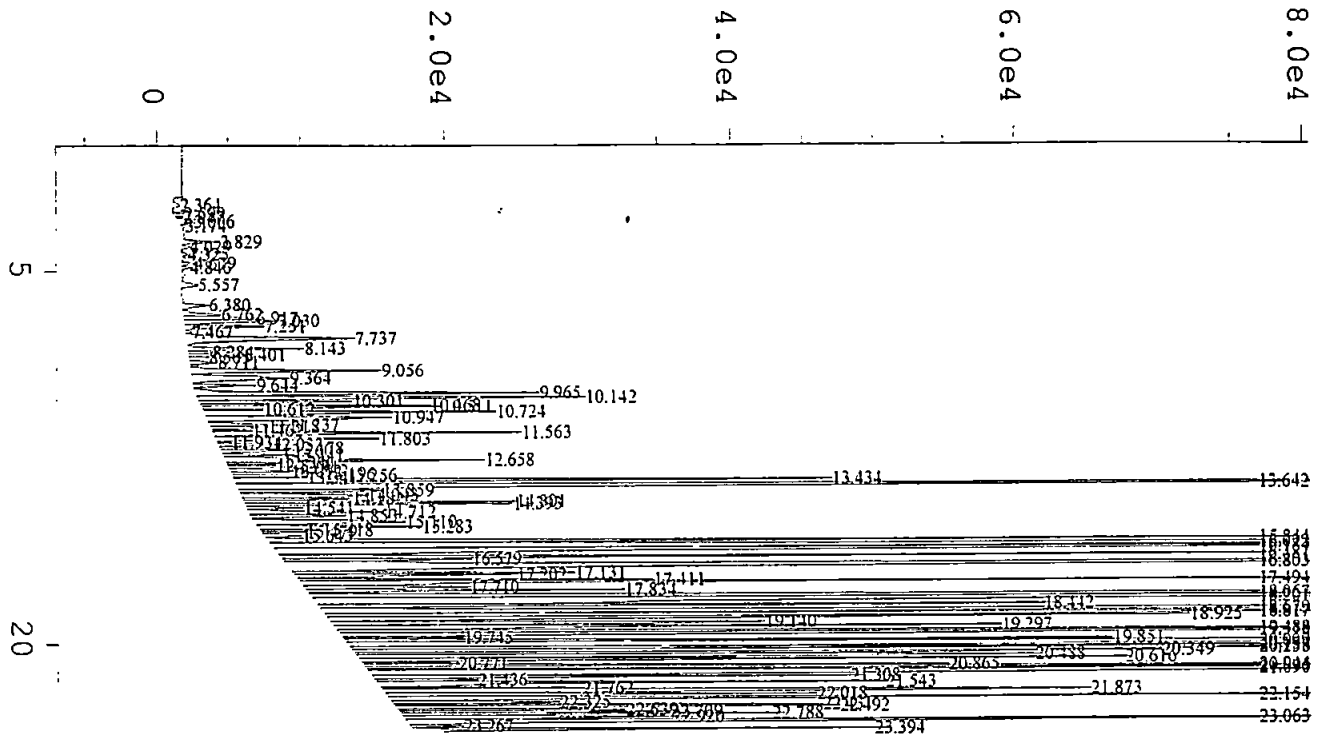
==========

Gas <5.0mg/kg

9-29-99

DAT

9-29-99 LH



==========

External Standard Report

==========

Data File Name : D:\HPCHEM\2\DATA\29092901\007R0101.D
Operator : LAH
Instrument : GAS/BTEX
Sample Name : 909092-4 1UL
Run Time Bar Code:
Acquired on : 29 Sep 99 11:52 AM
Report Created on: 29 Sep 99 12:15 PM
Last Recalib on : 18 AUG 99 01:03 PM
Multiplier : 1

Page Number : 1
Vial Number : 7
Injection Number : 1
Sequence Line : 1
Instrument Method: TPHG0999.MTH
Analysis Method : BTEX2899.MTH
Sample Amount : 0
ISTD Amount :

Sig. 2 in D:\HPCHEM\2\DATA\29092901\007R0101.D

Ret Time	Area	Type	Width	Ref#	ug/l	Name
6.762	18637	VV	0.097	1	0.0953	Benzene
8.401	18862	VV	0.072	1	0.261	TFT surrogate low dilution
10.468	55439	VV	0.053	1	0.278	Toluene
13.341	13661	VV	0.045	1	0.0845	Ethylbenzene
13.642	724406	VV	0.066	1	3.888	M+P-Xylene
14.301	85828	VV	0.065	1	0.474	O-Xylene

==========

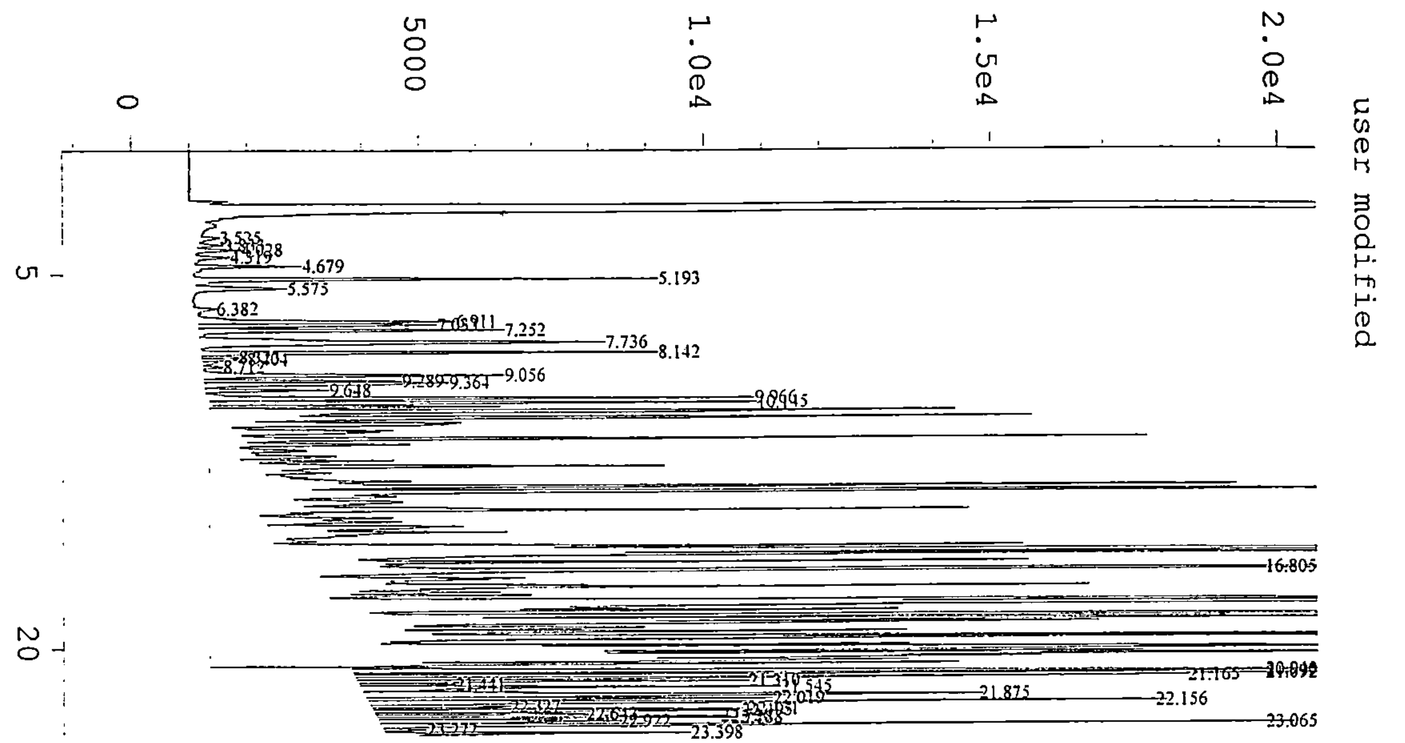
B, T, E = 10 mg/kg

Dry wt = 5.25

$X = 3.888\ \mu g/L \times \frac{5\ mL}{0.005\ mL} \times \frac{0.01\ L}{5.25\ g} = 37\ mg/kg$

CWE DAT 9/29/99

9-29-99 LH



==

External Standard Report

==

```
Data File Name     : D:\HPCHEM\2\DATA\29092901\007F0101.D
Operator           : LAH                          Page Number          : 1
Instrument         : GAS/BTEX                     Vial Number          : 7
Sample Name        : 909092-4 1UL                 Injection Number     : 1
Run Time Bar Code:                                Sequence Line        : 1
Acquired on        : 29 Sep 99  11:52 AM          Instrument Method: TPHG0999.MTH
Report Created on: 29 Sep 99  12:19 PM            Analysis Method      : TPHG0999.MTH
Last Recalib on    : 14 SEP 99 09:24 AM           Sample Amount        : 0
Multiplier         : 1                            ISTD Amount          :
```

Sig. 1 in D:\HPCHEM\2\DATA\29092901\007F0101.D

Ret Time	Area	Type	Width	Ref#	ug/l	Name
8.404	3694	VV	0.069	1	0.335	TFT-surrogate *low due to dilution*
16.805	4238780	MM	0.903	1	620.701	gasoline envelop

User Modified

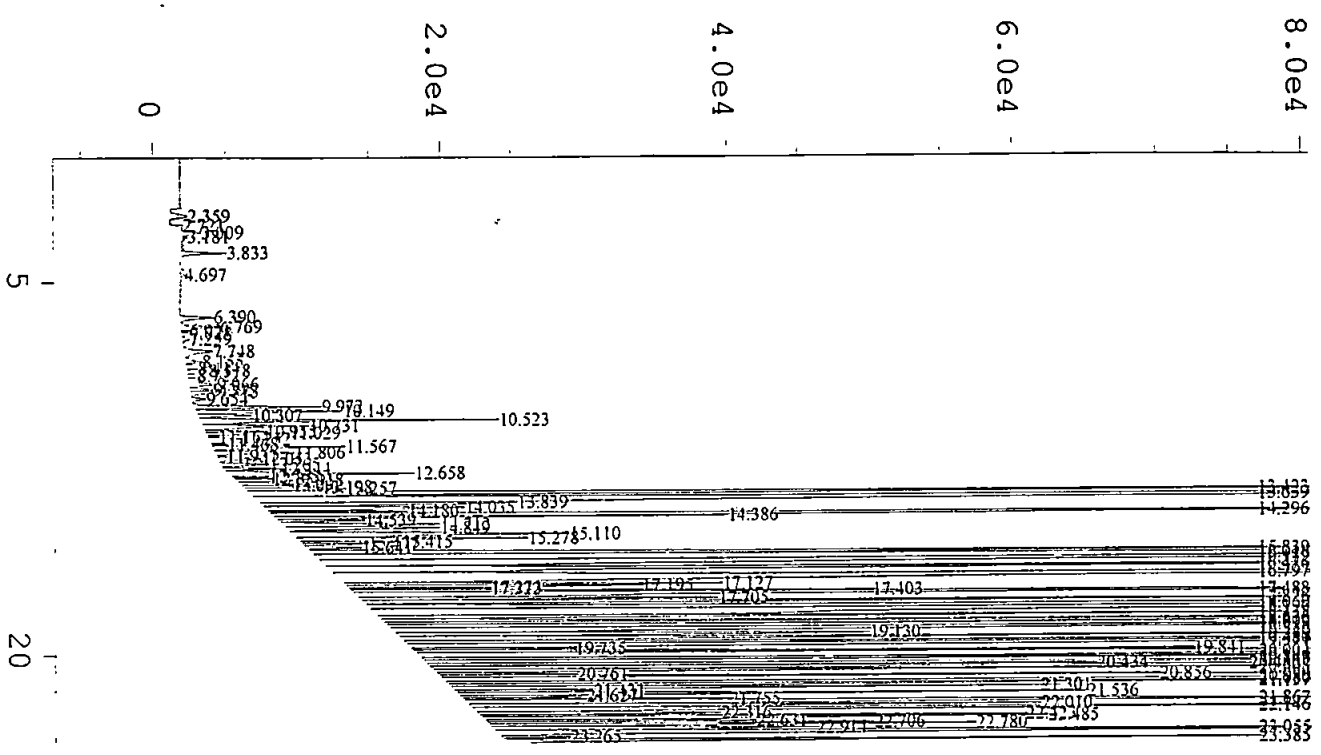
==

Gas = 620.701 ug/L x 5mL / 0.001mL x 0.01L / 5.25g = 5900 mg/Kg

~~note~~ lightly weathered gasoline

EWEL DAT *9-29-99*

9-29-99 LH



External Standard Report

Data File Name	: D:\HPCHEM\2\DATA\29092901\006R0101.D		
Operator	: LAH	Page Number	: 1
Instrument	: GAS/BTEX	Vial Number	: 6
Sample Name	: 909092-5 1UL	Injection Number	: 1
Run Time Bar Code:		Sequence Line	: 1
Acquired on	: 29 Sep 99 11:20 AM	Instrument Method	: TPHG0999.MTH
Report Created on	: 29 Sep 99 11:44 AM	Analysis Method	: BTEX2899.MTH
Last Recalib on	: 18 AUG 99 01:03 PM	Sample Amount	: 0
Multiplier	: 1	ISTD Amount	:

Sig. 2 in D:\HPCHEM\2\DATA\29092901\006R0101.D

Ret Time	Area	Type	Width	Ref#	ug/l	Name
6.769	17898	VV	0.100	1	0.0915	Benzene
8.414	6252	VV	0.110	1	0.0867	TFT surrogate
10.523	107427	VV	0.073	1	0.540	Toluene
13.423	509595	VV	0.064	1	4.485	Ethylbenzene
13.639	2619514	VV	0.061	1	19.568	M+P-Xylene
14.296	648460	VV	0.055	1	5.207	O-Xylene
					24.775	

low due to dilution

B,T < 10mg/kg

Dry wt = 5.41g

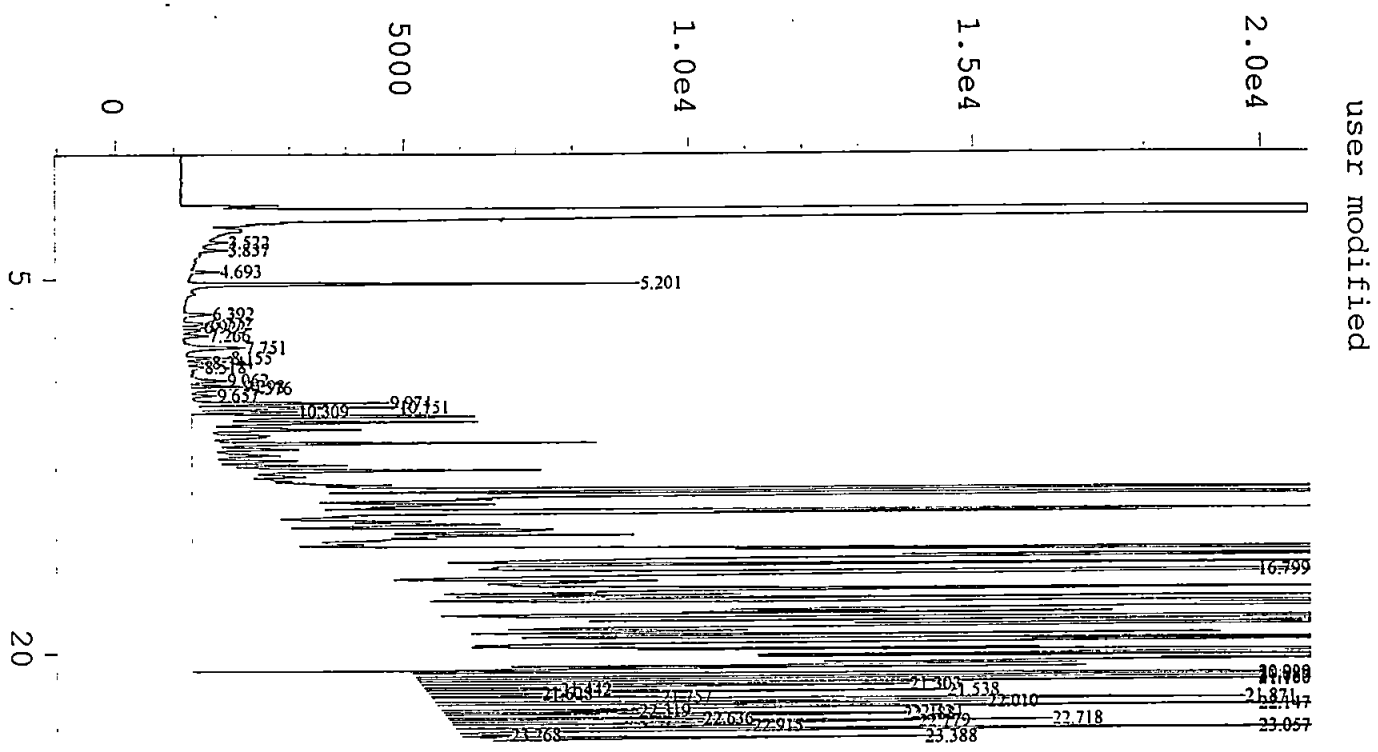
E = 4.485ug/L x 5mL / 0.001mL x 0.01L / 5.41g = 41 mg/kg

X = 230 mg/kg

EWEL DAT

9-29-99

9-29-99 H



External Standard Report

Data File Name : D:\HPCHEM\2\DATA\29092901\006F0101.D
Operator : LAH
Instrument : GAS/BTEX
Sample Name : 909092-5 1UL
Run Time Bar Code:
Acquired on : 29 Sep 99 11:20 AM
Report Created on: 29 Sep 99 11:45 AM
Last Recalib on : 14 SEP 99 09:24 AM
Multiplier : 1

Page Number : 1
Vial Number : 6
Injection Number : 1
Sequence Line : 1
Instrument Method: TPHG0999.MTH
Analysis Method : TPHG0999.MTH
Sample Amount : 0
ISTD Amount :

Sig. 1 in D:\HPCHEM\2\DATA\29092901\006F0101.D

Ret Time	Area	Type	Width	Ref#	ug/l	Name
8.518	1573	VV	0.086	1	0.143	TFT-surrogate low due to dilution
16.799	6497906	MM	0.628	1	963.998	gasoline envelop

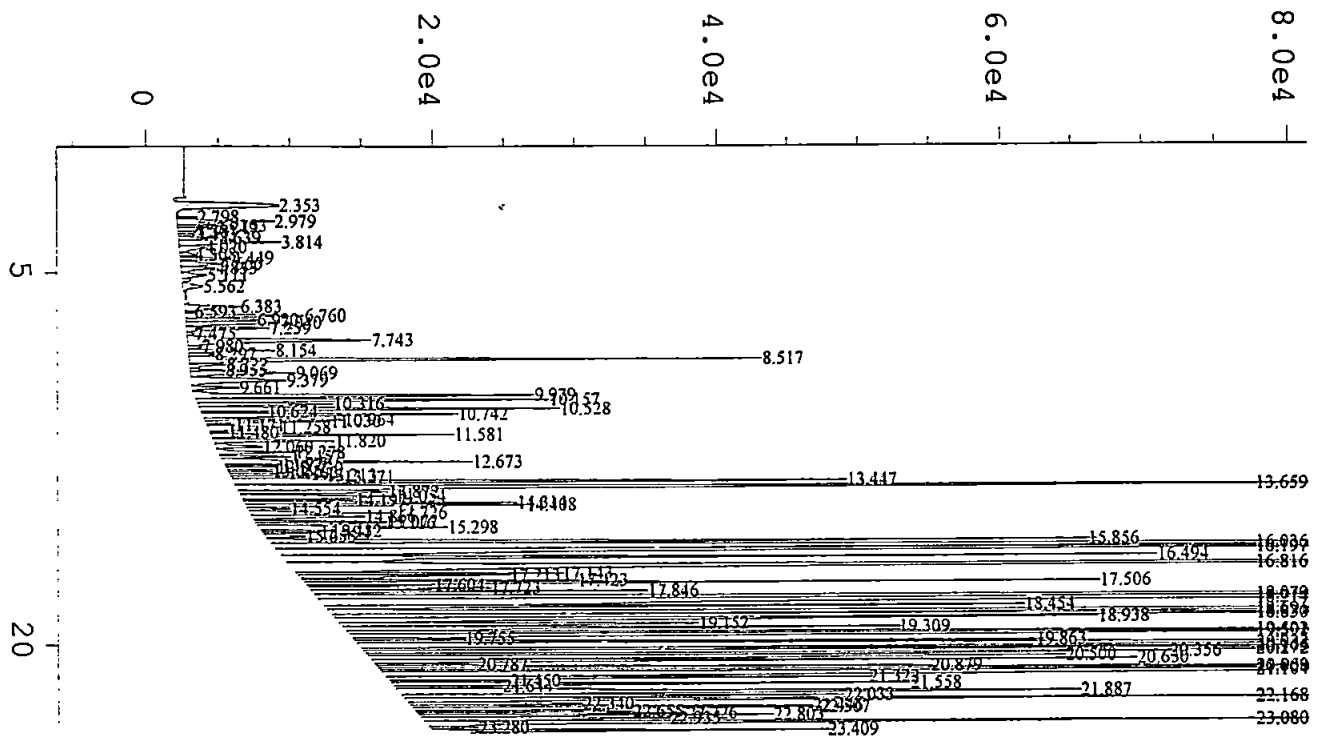
User Modified

Gas $963.998\ \mu g/L \times \frac{5\ mL}{0.001} \times \frac{0.01\ L}{5.41\ g} = 8900\ mg/kg$

weathered gasoline

JEWEL DATE 9-29-99

9-29-99



External Standard Report

Data File Name	: D:\HPCHEM\2\DATA\29092801\022R0301.D		
Operator	: LAH	Page Number	: 1
Instrument	: GAS/BTEX	Vial Number	: 22
Sample Name	: 909092-6 50UL	Injection Number	: 1
Run Time Bar Code:		Sequence Line	: 3
Acquired on	: 28 Sep 99 10:46 PM	Instrument Method	: TPHG0999.MTH
Report Created on	: 29 Sep 99 09:55 AM	Analysis Method	: BTEX2899.MTH
Last Recalib on	: 18 AUG 99 01:03 PM	Sample Amount	: 0
Multiplier	: 1	ISTD Amount	:

Sig. 2 in D:\HPCHEM\2\DATA\29092801\022R0301.D

Ret Time	Area	Type	Width	Ref#	ug/l	Name
6.760	48757	VV	0.088	1	0.249	Benzene
8.517	208568	VV	0.077	1	3.899	TFT surrogate kc = 7.798 ÷ 10 x 100 = 78.0
10.528	146169	VV	0.081	1	0.734	Toluene
13.447	250303	VV	0.089	1	1.888	Ethylbenzene
13.659	603121	VV	0.068	1	2.885	M+P-Xylene
14.314	83572	VV	0.063	1	0.462	O-Xylene

B.T. < 0.2 mg/kg

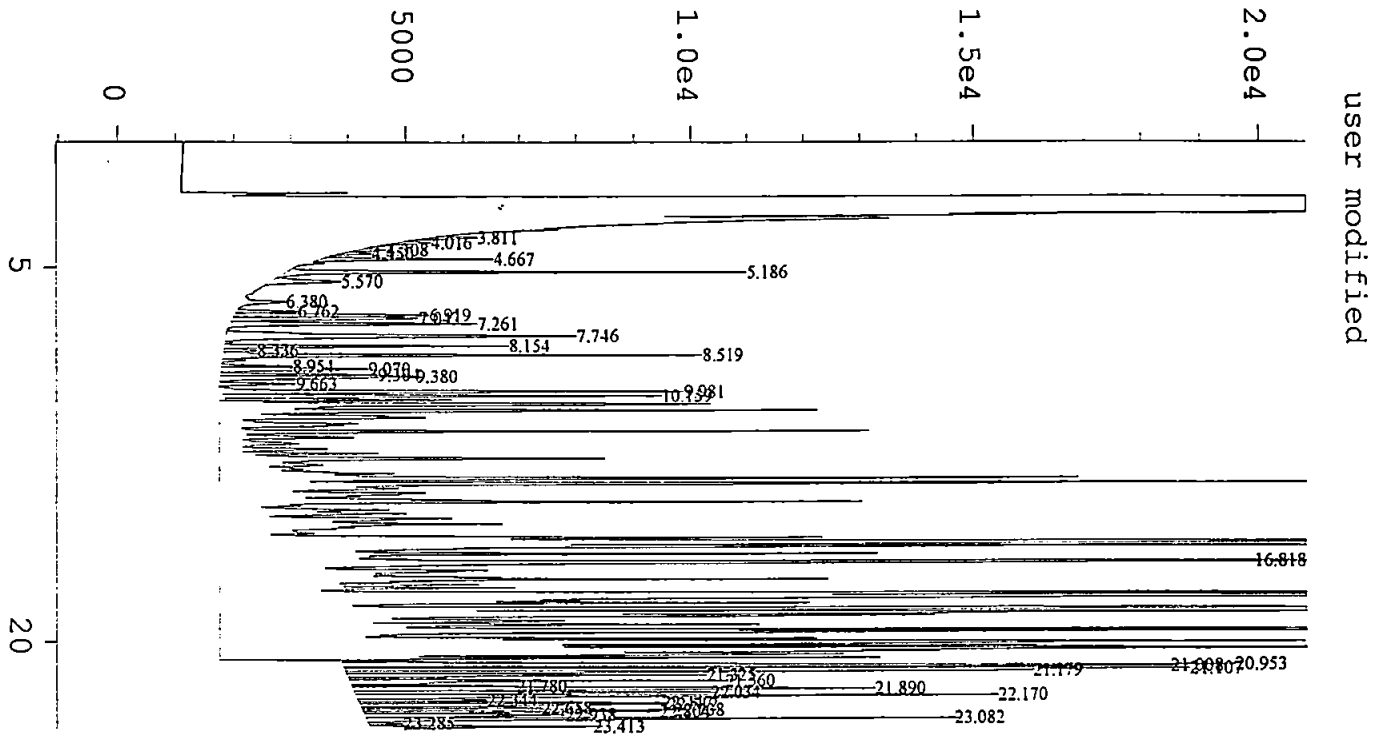
Dilution = 5.02

C = 1888 µg/L x 5mL / 0.05mL x 0.05L / 5.02 = 0.4 mg/kg

X < 0.2 mg/kg

JEWEL DATE 9/29/99

G 2999



==========

External Standard Report

==========

Data File Name	: D:\HPCHEM\2\DATA\29092801\022F0301.D		
Operator	: LAH	Page Number	: 1
Instrument	: GAS/BTEX	Vial Number	: 22
Sample Name	: 909092-6 50UL	Injection Number	: 1
Run Time Bar Code:		Sequence Line	: 3
Acquired on	: 28 Sep 99 10:46 PM	Instrument Method:	TPHG0999.MTH
Report Created on:	29 Sep 99 08:46 AM	Analysis Method	: TPHG0999.MTH
Last Recalib on	: 14 SEP 99 09:24 AM	Sample Amount	: 0
Multiplier	: 1	ISTD Amount	:

Sig. 1 in D:\HPCHEM\2\DATA\29092801\022F0301.D

Ret Time	Area	Type	Width	Ref#	ug/l	Name
8.519	41892	VV	0.075	1	3.801	TFT-surrogate x2= 7.602 ÷10 x100= 76 %
16.818	3477013	MM	0.997	1	504.943	gasoline envelop

User Modified

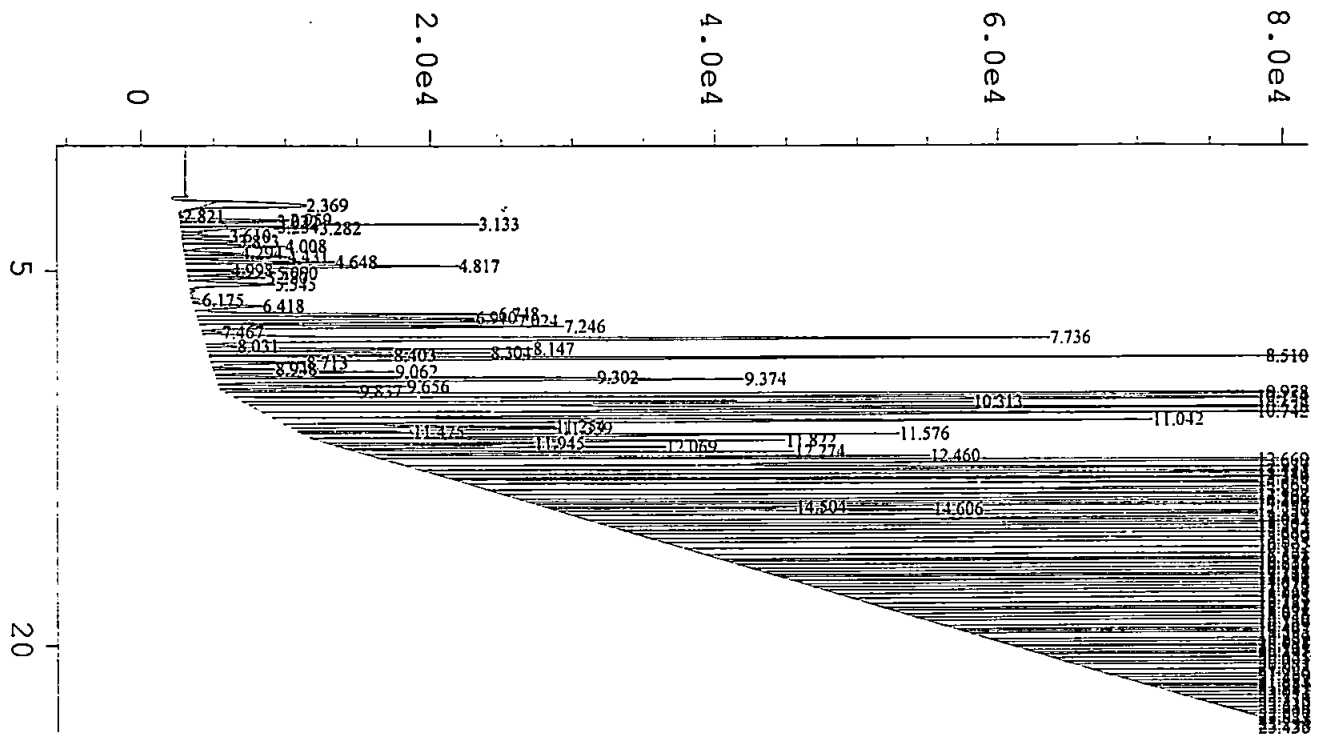
==========

Gas = 504.943 ug/L x 5 mL / 0.5 mL x 0.01 L / 5.02 g = 100 mg/kg

IEWED
DATE

9-29-99

9-29-99



External Standard Report

Data File Name : D:\HPCHEM\2\DATA\29092801\023R0301.D
Operator : LAH
Instrument : GAS/BTEX
Sample Name : 909092-7 100UL
Run Time Bar Code:
Acquired on : 28 Sep 99 11:18 PM
Report Created on: 29 Sep 99 10:15 AM
Last Recalib on : 18 AUG 99 01:03 PM
Multiplier : 1

Page Number : 1
Vial Number : 23
Injection Number : 1
Sequence Line : 3
Instrument Method: TPHG0999.MTH
Analysis Method : BTEX2899.MTH
Sample Amount : 0
ISTD Amount :

Sig. 2 in D:\HPCHEM\2\DATA\29092801\023R0301.D

Ret Time	Area	Type	Width	Ref#	ug/l	Name
6.748	114611	VV	0.081	1	0.586	Benzene
8.510	420141	VV	0.078	1	8.394	TFT surrogate
10.528	825816	VV	0.081	1	6.432	Toluene
13.459	986433	VV	0.086	1	9.260	Ethylbenzene
13.665	1941141	VV	0.082	1	13.955	M+P-Xylene
14.323	375974	VV	0.062	1	2.755	O-Xylene

B = 0.1 mg/kg

T = 6.432 µg/L x 5mL / 0.1mL x 0.01L / 0.39g = 0.5 mg/kg

E = 0.7 mg/kg

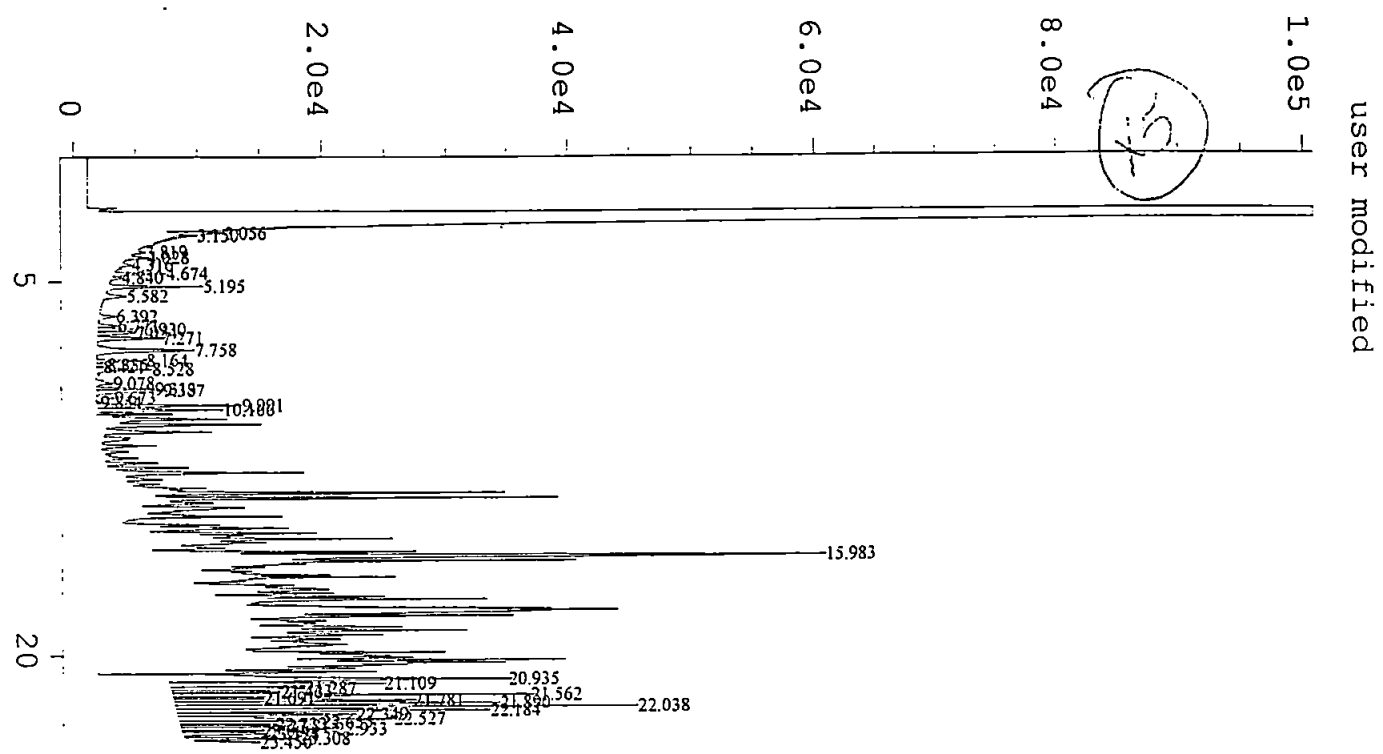
X = 1.5 mg/kg

VIEWED & DATE 9/29/99

DIN OUT = 6.5%

Plexum for Gas

9-29-99LH



==========

External Standard Report

==========

Data File Name	: D:\HPCHEM\2\DATA\29092901\005F0101.D		
Operator	: LAH	Page Number	: 1
Instrument	: GAS/BTEX	Vial Number	: 5
Sample Name	: 909092-7 25UL	Injection Number	: 1
Run Time Bar Code:		Sequence Line	: 1
Acquired on	: 29 Sep 99 10:49 AM	Instrument Method	: TPHG0999.MT
Report Created on	: 29 Sep 99 11:16 AM	Analysis Method	: TPHG0999.MT
Last Recalib on	: 14 SEP 99 09:24 AM	Sample Amount	: 0
Multiplier	: 1	ISTD Amount	:

Sig. 1 in D:\HPCHEM\2\DATA\29092901\005F0101.D

Ret Time	Area	Type	Width	Ref#	ug/l	Name
8.528	23403	VV	0.077	1	2.124	TFT-surrogate
15.983	7574205	MM	2.133	1	1127.553	gasoline envelop

User Modified

==========

Gas $1127.553 \mu g/L \times \frac{5mL}{0.025mL} \times \frac{0.01L}{0.5g} = 350 mg/kg$ gasoline

VIEWED & DATE 9-29-99

9-29-99 LH