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INTERIM CLEANUP REPORT ☒
SITE CHARACTERIZATION ☐
FINAL CLEANUP REPORT ☐
OTHER ☐
AFFECTED MEDIA: SOIL ☒
OTHER ☒
INSPECTOR (INIT.) RMF DATE 11-28-94

Report of Geoenvironmental Services
Supplemental Subsurface Explorations
and Remedial Excavation Monitoring
Decommissioned Service Station
60090619, 2200 Elm Street
Bellingham, Washington

February 10, 1993

For
Chevron U.S.A. Products Company

February 10, 1993

Geotechnical,
Geoenvironmental and
Geologic Services

Chevron U.S.A. Products Company
20500 Richmond Beach Drive Northwest
Seattle, Washington 98177

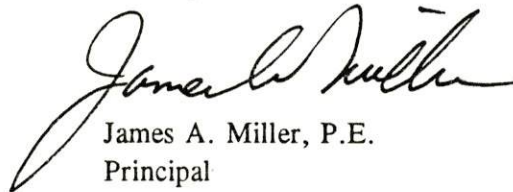
Attention: Mr. Keith Kringlen

We are submitting two copies of our "Report of Geoenvironmental Services" for supplemental subsurface explorations and remedial excavation monitoring at Chevron Service Station 60090619 in Bellingham, Washington. Our services were authorized by Chevron on May 20, 1992 and were performed under the terms of blanket contract number P16CNW00699X, Release No. 4571170, Change Orders 2 and 3.

We appreciate the opportunity to be of service to Chevron U.S.A. Please call if you have questions regarding this report.

Yours very truly,

GeoEngineers, Inc.


James A. Miller, P.E.
Principal

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EXECUTIVE SUMMARY

Subsurface explorations in 1991 detected hydrocarbons in soil samples from some portions of the subject site at concentrations greater than cleanup levels. A VES was constructed at the site in mid-1991 to remediate the subsurface hydrocarbons. GeoEngineers excavated test pits in September 1992 at the approximate locations where hydrocarbon concentrations exceeding cleanup levels had been detected in 1991. Soil samples were obtained from the test pits for chemical analysis to evaluate if hydrocarbon concentrations had decreased to less than cleanup levels during the period of VES operation.

Test pit samples indicated successful treatment of soils beneath portions of the site. However, hydrocarbon concentrations exceeding soil cleanup levels were detected in soil samples obtained from the southern corner of the site. Remedial excavation was performed to remove this soil. Chemical analysis of soil samples obtained from the final limits of the remedial excavation indicate that soil containing hydrocarbons exceeding the MTCA Method A cleanup levels was successfully removed, with the exception of soil at two locations along the southeast boundary of the site.

Approximately 1,150 cubic yards of excavated soil (stockpile volume) was stockpiled on site for testing and/or aeration. Hydrocarbon concentrations less than MTCA (Model Toxics Control Act) Method A cleanup levels were reported for soil from portions of the stockpiled soil. Soil with acceptable hydrocarbon concentrations was placed back in the remedial excavation.

Approximately 900 cubic yards of soil containing hydrocarbon concentrations exceeding MTCA Method A cleanup levels currently are stockpiled on site.

**REPORT OF GEOENVIRONMENTAL SERVICES
SUPPLEMENTAL SUBSURFACE EXPLORATIONS
AND REMEDIAL EXCAVATION MONITORING
DECOMMISSIONED SERVICE STATION 60090619
2200 ELM STREET
BELLINGHAM, WASHINGTON
FOR
CHEVRON U.S.A. PRODUCTS COMPANY**

INTRODUCTION

This report presents the results of our geoenvironmental monitoring services during supplemental subsurface explorations and remedial excavation at the site of decommissioned Chevron Service Station 60090619, located at 2200 Elm Street in Bellingham, Washington. The Ecology (Washington State Department of Ecology) UST (underground storage tank) site number for this property is 005060. The site location relative to surrounding physical features is shown in Figure 1. A general site plan is presented in Figure 2.

GeoEngineers conducted several phases of subsurface hydrocarbon studies at the site between November 2, 1990 and April 11, 1991. These studies included monitoring the removal of nine USTs and associated facilities at the site, monitoring the drilling and construction of 19 monitoring wells (MW-1 through MW-19), and collecting soil samples from the borings and ground water samples from the monitoring wells for chemical analysis of hydrocarbons.

Our subsurface studies detected hydrocarbons at concentrations exceeding MTCA (Model Toxics Control Act) Method A cleanup levels in soil and ground water samples obtained from portions of the site. The results of these studies are presented in our reports dated January 23, March 14 and May 21, 1991.

A VES (vapor extraction system) was installed at the site to facilitate the degradation and volatilization of subsurface hydrocarbons. Monitoring wells MW-1, MW-9, MW-10, MW-11, MW-12 and MW-15 were used as vapor extraction wells. Additionally, lateral vapor extraction piping was constructed in the site's former gasoline UST excavation and former used-oil UST excavation. The VES was activated on May 3, 1991. Hydrocarbon vapor extraction rates were estimated to be less than 1 pound per week after one year of VES operation. VES operation was discontinued on September 13, 1992 because the vapor extraction rates were relatively low and ground water quality generally was in compliance with MTCA Method A cleanup levels. Concentrations of hydrocarbons in ground water samples obtained from the site in February and May 1992 were less than MTCA Method A cleanup levels in all wells but MW-9 and MW-11. Summaries of our remedial action monitoring services that occurred between May 3, 1991 and February 26, 1992 are presented in our reports dated October 9 and 15, 1991 and February 27, March 23 and September 22, 1992.

SCOPE

Chevron authorized a supplemental subsurface hydrocarbon study in the immediate vicinity of MW-9 and MW-11 based on the ground water monitoring results, and in locations where previous studies detected hydrocarbon concentrations exceeding MTCA Method A cleanup levels. The purpose of our services was to evaluate the extent of soil containing hydrocarbon concentrations exceeding cleanup levels at the site after operation of the VES and to monitor remedial excavation of these soils. GeoEngineers' scope of services completed for this project is as follows:

1. Observe and document the excavation of 10 test pits where the results of previous studies indicated hydrocarbon concentrations exceeding MTCA Method A cleanup levels.
2. Obtain soil samples at approximate 1-foot intervals from the test pits for field screening for evidence of hydrocarbons.
3. Submit selected test pit soil samples for one or more of the following chemical analyses: hydrocarbon identification by Ecology Method WTPH-HCID, gasoline-range hydrocarbons by Ecology Method WTPH-G, diesel-range hydrocarbons by Ecology Method WTPH-D, oil-range hydrocarbons by Ecology Method 418.1 Modified, and volatile aromatic hydrocarbons (BETX [benzene, ethylbenzene, toluene, total xylenes]) by EPA Method 8020.
4. Observe and document the remedial excavation of soil containing hydrocarbon concentrations exceeding MTCA Method A cleanup levels based on chemical analytical results and/or field screening evidence.
5. Observe and document the removal of monitoring wells MW-9, MW-10, MW-11 and MW-13 during the remedial excavation activities.
6. Obtain soil samples from the final limits of the remedial excavation, resulting soil stockpiles and aerated soil stockpiles for field screening and for one or more of the chemical analyses listed in scope item 3.
7. Evaluate the field and laboratory data with regard to existing regulatory concerns.

SOIL CLEANUP CRITERIA

Ecology has indicated that it is appropriate to use the MTCA Method A soil cleanup levels (WAC 173-340-740) at most service stations sites where the cleanup action may be routine or involve relatively few hazardous substances. The MTCA Method A cleanup levels that can be applied to this site are included in Tables 1 through 4.

MONITORING ACTIVITIES

TEST PIT EXCAVATIONS

Sleister (A.L. Sleister and Sons Construction Inc.) was contracted by Chevron to excavate the test pits. Ten test pits (TP-1 through TP-10) were excavated at the site between September 15 and 17, 1992 at the approximate locations shown in Figure 2. A GeoEngineers geologist who

is registered with Ecology to perform site assessments at UST sites documented the soil conditions encountered in the test pits and obtained soil samples for field screening and chemical analysis.

The test pits were completed to depths ranging from approximately 8 to 12 feet beneath the ground surface. The test pits encountered silt, sand and/or gravel fill to depths ranging from approximately 3 to 10 feet beneath the ground surface. Native soil beneath the fill included layers and lenses of silt, sand and gravel. Ground water seepage was observed in TP-1, TP-7, TP-9 and TP-10 at depths ranging from approximately 8.5 to 11 feet beneath the ground surface.

Soil samples were obtained at 1-foot depth intervals from the test pits for field screening. Soil samples were selected for chemical analysis based on field screening results and/or chemical analytical results for soil samples that were obtained from the immediate vicinity of the test pits during previous studies. A description of soil sampling methods and the test pit logs are presented in Appendix A.

Thirteen discrete soil samples obtained from TP-1 through TP-8 were submitted for chemical analysis. No samples from TP-9 and TP-10 were submitted for chemical analysis because field screening indicated that hydrocarbon concentrations in soil at these locations exceeded cleanup levels. A summary of field screening and chemical analytical results for soil samples obtained from TP-1 through TP-8 is presented in Table 1. Gasoline-range hydrocarbon concentrations detected in the test pit soil samples and gasoline-range hydrocarbon concentrations detected at the test pit locations during previous studies are presented in Figure 2. Laboratory reports are presented in Appendix B.

The test pits were backfilled with excavated soil after soil sampling was completed, with the exception of TP-1, TP-9 and TP-10. Soil excavated from these test pits contained field screening evidence of hydrocarbons and was stockpiled on site.

REMEDIAL EXCAVATION

Sleister excavated approximately 1,150 cubic yards (stockpile volume) of soil from the southern portion of the site between September 22 and 24 and between November 12 and 25, 1992. The depths of the final remedial excavation ranged from approximately 4.5 to 14 feet beneath the ground surface. Soil encountered in the excavation generally consisted of silt and gravel fill overlying native sand and gravel layers. Ground water seepage was encountered in the remedial excavation at a depth of approximately 9 feet beneath the ground surface. We also observed the removal of monitoring wells MW-9, MW-10, MW-11 and MW-13 during remedial excavation activities. The approximate final limits of the remedial excavation are shown in Figure 3.

The excavated soil was stockpiled on site. Stockpiles were placed on plastic sheeting, bermed with straw bales and covered with plastic sheeting.

A 2-inch-diameter steel pipe, approximately 40 feet long, was removed from the northeastern portion of the excavation on November 13. The pipe appeared to be an old product line. The pipe was approximately 3 feet beneath the ground surface. The approximate location of the pipe is shown in Figure 3.

A 4-inch-diameter section of clay pipe, approximately 40 feet long, was removed from the eastern portion of the excavation on November 25. The pipe appeared to be a drain line associated with the previous gasoline station that occupied the site. The pipe was located approximately 2.0 feet below the ground surface. Soil staining indicative of heavy petroleum hydrocarbons was detected beneath the pipe where it exits the southeastern boundary of the site. The approximate location of the clay pipe is shown in Figure 3.

Twenty-nine discrete soil samples (920922-G1 through 921125-G29) were obtained from the limits of the remedial excavation at depths ranging from 2.0 to 14.0 feet beneath the ground surface for chemical analysis. The approximate locations of soil samples obtained from the final limits of the excavation are shown in Figure 3. Sample locations for 920924-G11, 920924-G12 and 921113-G17 are not shown on Figure 3. These samples were obtained from areas where additional excavation was performed on the basis of field screening and/or chemical analytical results for the three samples. A summary of field screening and chemical analytical results for samples obtained from the remedial excavation is presented in Table 2.

SOIL STOCKPILES

Approximately 450 cubic yards (stockpile volume) of soil were excavated and stockpiled on site between September 22 and 24. An estimated 150 cubic yards (stockpile volume) of this excavated soil was overburden that did not contain field screening evidence of hydrocarbons. Four discrete soil samples (920923-SS1 through -SS4) were obtained from the overburden soil stockpile for chemical analysis. Additionally, six discrete soil samples (920924-SS2-1 through -6) were obtained from approximately 300 cubic yards of the stockpiled soil containing gasoline-related hydrocarbons. Field screening and chemical analytical results for the soil stockpile samples are presented in Table 3. Laboratory reports are presented in Appendix B.

Chemical analysis of soil samples obtained from the overburden stockpile did not detect hydrocarbons with the exception of toluene which was detected in one soil sample at a concentration less than the cleanup level. The approximately 300 cubic yards of soil containing hydrocarbons were aerated by turning the stockpile repeatedly with a front-end loader and excavator on October 27, 1992. Five discrete soil samples (921027-AS1 through -AS5) were obtained from the aerated stockpile for chemical analysis. Field screening and chemical analytical results for the aerated soil stockpile are summarized in Table 4. Laboratory reports are presented in Appendix B. Approximately 100 cubic yards of the aerated soil stockpile contained hydrocarbon concentrations less than cleanup levels based on chemical analysis. This soil was returned to the excavation as backfill along with the 150 cubic yards of overburden.

An additional 680 cubic yards (stockpile volume) of soil containing gasoline-related hydrocarbons were excavated between November 12 and 25. Approximately 20 cubic yards

(stockpile volume) of soil containing heavier petroleum hydrocarbons were excavated on November 25 from the vicinity of the clay pipe and stockpiled separately. Six discrete soil samples (921116-1 through -6) were obtained from the 680-cubic-yard stockpile and one discrete soil sample (921125-7) was obtained from the 20-cubic-yard stockpile for chemical analysis. Field screening and chemical analytical results for these samples are summarized in Table 3. Laboratory reports are presented in Appendix B.

A total of approximately 900 cubic yards (stockpile volume) of soil is currently stockpiled on site.

CONCLUSIONS

Field screening and chemical analytical results indicate that the VES was successful in reducing gasoline-related hydrocarbon concentrations to less than cleanup levels in soil at the locations of TP-2, TP-4, TP-5, TP-7 and TP-8, as shown in Figure 2. Field screening and chemical analytical results also indicate that soil containing residual gasoline-related hydrocarbons exceeding cleanup levels was successfully removed from the remedial excavation in the southern portion of the site.

Chemical analytical results indicate that soil containing gasoline-related hydrocarbon concentrations greater than the cleanup level remains at two locations (sample locations 920922-G2 and 921125-G26) along the southeast boundary of the site. The chemical analytical results for sample 921125-G26 also indicate that heavier petroleum hydrocarbons are present at concentrations exceeding cleanup levels in soil beneath a buried clay pipe at the southeastern boundary of the site. Approximately 880 cubic yards of soil containing concentrations of gasoline-related hydrocarbons exceeding the cleanup level are stockpiled on site. Additionally, approximately 20 cubic yards (stockpile volume) of soil containing heavier petroleum hydrocarbon concentrations exceeding cleanup levels are stockpiled on site.

LIMITATIONS

We have prepared this report for use by Chevron U.S.A. Products Company. This report may be made available to other parties with an active interest in the site, as approved by Chevron, and to regulatory agencies. This report is not intended for use by others, and the information contained herein is not applicable to other sites.

This report is based on our field observations and chemical analysis of 59 soil samples obtained from the site between September and November 1992. It is always possible that hydrocarbons may be present in areas of the site that were not excavated or sampled.

Within the limitations of scope, schedule and budget, our services have been executed in accordance with generally accepted practices in this area at the time this report was prepared. No other conditions, express or implied, should be understood.

We look forward to being of continued service to Chevron U.S.A. Please call if you have questions regarding this submittal.

Respectfully submitted,

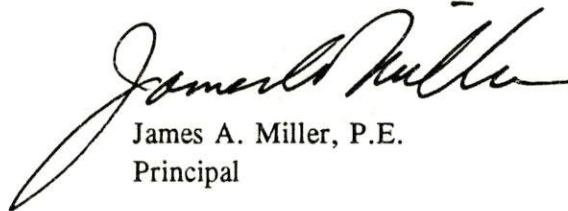
GeoEngineers, Inc.



David D. King
Staff Geologist



Kurt R. Fraese
Project Manager



James A. Miller, P.E.
Principal

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TABLE 1
SUMMARY OF SOIL ANALYTICAL DATA¹
TEST PIT EXCAVATIONS

Sample Number ²	Date Sampled	Depth of Sample (feet)	Field Screening Results ³		Volatile Aromatic Hydrocarbons ⁴ (EPA Method 8020) (mg/kg)				Gasoline-range Hydrocarbons (Ecology Method WTPH-G) (mg/kg)	Diesel-Range Hydrocarbons (Ecology Method WTPH-D) (mg/kg)	Oil-range Hydrocarbons (Ecology Method WTPH-418.1M) (mg/kg)
			Headspace Vapors (ppm)	Sheen	B	E	T	X			
920915-TP1	09/15/92	11.5	160	S	ND	ND	ND	0.029	19	--	--
920915-TP2	09/15/92	8.5	<100	S	ND	ND	ND	ND	ND	--	--
920915-TP3	09/15/92	4.0	<100	S	ND	ND	ND	ND	ND	--	--
920915-TP3-2	09/15/92	8.0	1,100	NS	ND	0.11	ND	0.30	190	--	--
920915-TP3-3	09/15/92	9.0	<100	S	ND	ND	ND	ND	ND	--	--
920916-TP4	09/16/92	8.0	600	S	ND	0.15	ND	0.26	63	--	--
920916-TP5	09/16/92	8.0	<100	S	ND	ND	ND	ND	ND	--	--
920916-TP6	09/16/92	4.0	<100	S	ND	0.033	.038	0.064	12	--	--
920916-TP6-2	09/16/92	8.0	240	S	ND	0.18	ND	0.78	130	--	--
920916-TP6-3	09/16/92	8.5	<100	NS	ND	ND	ND	ND	ND	--	--
920916-TP7	09/16/92	9.0	<100	S	ND	ND	ND	ND	ND	--	--
920916-TP8	09/16/92	6.0	<100	S	ND	ND	ND	ND	5.8	--	--
920916-TP8-2	09/16/92	8.0	<100	S	ND	ND	ND	ND	ND	ND	ND
MTCA Method A Cleanup Levels					0.5	20	40	20	100	200	200

Notes:

¹Chemical analyses were conducted by Analytical Technologies, Inc. Laboratory reports are presented in Appendix B.

²Approximate test pit locations are shown in Figure 2.

³Field screening methods are described in Appendix A. Combustible headspace vapors are measured with a Bacharach TLV Sniffer calibrated to hexane.

NS = no sheen, S = sheen

⁴B = benzene, E = ethylbenzene, T = toluene, X = total xylenes.

ppm = parts per million; mg/kg = milligrams per kilogram; "--" = not tested; ND = not detected; detection limits are presented in laboratory reports in Appendix B.

TABLE 2 (Page 1 of 2)
SUMMARY OF SOIL ANALYTICAL DATA¹
REMEDIAL EXCAVATION

Sample Number ²	Date Sampled	General Location	Depth of Sample (feet)	Field Screening Results ³		Volatile Aromatic Hydrocarbons ⁴ (EPA Method 8020) (mg/kg)				Gasoline-range Hydrocarbons (Ecology Method WTPH-G) (mg/kg)	Oil-range Hydrocarbons (Ecology Method WTPH-418.1M) (mg/kg)
				Headspace Vapors (ppm)	Sheen	B	E	T	X		
920922-G1	09/22/92	South wall	11.5	380	S	ND	ND	ND	0.037	ND	--
920922-G2	09/22/92	Southeast wall	11.5	4,000	S	ND	0.72	0.56	1.5	140	--
920922-G3	09/22/92	Southwest wall	11.5	<100	S	ND	ND	ND	0.048	ND	--
920922-G4	09/22/92	Base	14.5	0	NS	ND	ND	ND	ND	ND	--
920923-G5	09/23/92	West wall	9.5	2,000	S	ND	ND	ND	ND	ND	--
920923-G6	09/23/92	Base	14.0	<100	S	ND	ND	ND	ND	ND	--
920923-G7	09/23/92	Southeast wall	9.5	<100	S	ND	ND	ND	ND	ND	--
920923-G8	09/23/92	West wall	10.0	400	S	ND	ND	ND	ND	ND	--
920924-G9	09/24/92	Base	11.0	<100	NS	ND	ND	ND	ND	ND	--
920924-G10	09/24/92	Southeast wall	10.0	<100	S	ND	ND	ND	ND	ND	--
920924-G11	09/24/92	North wall	10.0	>10,000	S	ND	1.4	ND	3.3	650	--
920924-G12	09/24/92	North wall	9.5	<100	S	ND	ND	ND	ND	ND	--
921112-G13	11/12/92	Base	9.5	<100	NS	ND	ND	ND	ND	ND	--
921112-G14	11/12/92	West wall	4.0	<100	S	ND	ND	ND	ND	ND	--
921112-G15	11/12/92	Base	9.0	<100	NS	ND	ND	ND	ND	ND	--
921112-G16	11/12/92	North wall	7.0	<100	S	ND	ND	ND	ND	ND	--
921113-G17	11/13/92	North wall	6.0	<100	S	ND	ND	ND	3.1	20	--
921113-G18	11/13/92	Base	10.0	<100	NS	ND	ND	0.033	ND	ND	--
921113-G19	11/13/92	East wall	9.5	<100	S	ND	ND	0.032	ND	ND	--

Notes appear on page 2 of 2.

TABLE 2 (Page 2 of 2)

Sample Number ²	Date Sampled	General Location	Depth of Sample (feet)	Field Screening Results ³		Volatile Aromatic Hydrocarbons ⁴ (EPA Method 8020) (mg/kg)				Gasoline-range Hydrocarbons (Ecology Method WTPH-G) (mg/kg)	Oil-range Hydrocarbons (Ecology Method WTPH-418.1M) (mg/kg)
				Headspace Vapors (ppm)	Sheen						
						B	E	T	X		
921116-G25	11/16/92	North wall	10.0	<100	S	ND	ND	ND	ND	ND	--
921125-G26 ⁵	11/25/92	Northeast wall	2.0	200	S	0.042	1.1	0.13	3.3	110	6,000
921125-G27	11/25/92	Base	4.5	<100	NS	ND	ND	ND	ND	ND	--
921125-G28	11/25/92	Northeast wall	7.5	<100	NS	ND	ND	ND	ND	ND	--
921125-G29	11/25/92	North wall	6.0	<100	S	ND	ND	ND	ND	ND	--
MTCA Method A Cleanup Levels						0.5	20	40	20	100	200

Notes:

¹Chemical analyses were conducted by Analytical Technologies, Inc. Laboratory reports are presented in Appendix B.

²Approximate sample locations are shown in Figure 3.

³Field screening methods are described in Appendix A. Combustible headspace vapors were measured with a Bacharach TLV Sniffer calibrated to hexane.

NS = no sheen, S = sheen.

⁴B = benzene, E = ethylbenzene, T = toluene, X = total xylenes.

⁵Oil-range hydrocarbons were qualitatively identified in this sample using Ecology Method TPH-HCID.

ppm = parts per million; mg/kg = milligrams per kilogram; ND = not detected; detection limits are presented in laboratory reports in Appendix B.

Shading indicates that further excavation was completed in the area from which the sample was obtained to remove soil containing hydrocarbon concentrations greater than MTCA

Method A cleanup levels. Sample location not shown in Figure 3.

TABLE 3
SUMMARY OF SOIL ANALYTICAL DATA¹
STOCKPILE SAMPLES

Sample Number ²	Date Sampled	Stockpile Volume (cubic yards)	Field Screening Results ²		Volatile Aromatic Hydrocarbons ³ (EPA Method 8020) (mg/kg)				Gasoline-range Hydrocarbons (Ecology Method WTPH-G) (mg/kg)	Oil-range Hydrocarbons (Ecology Method WTPH-418.1M) (mg/kg)
			Headspace Vapors (ppm)	Sheen						
					B	E	T	X		
920923-SS1	09/23/92	150 ⁴	<100	NS	ND	ND	ND	ND	ND	--
920923-SS2	09/23/92		<100	S	ND	ND	0.036	ND	ND	--
920923-SS3	09/23/92		<100	S	ND	ND	ND	ND	ND	--
920923-SS4	09/23/92		<100	S	ND	ND	ND	ND	ND	--
920924-SS2-1	09/24/92	300	8,000	S	ND	0.14	0.031	0.31	72	--
920924-SS2-2	09/24/92		> 10,000	S	ND	0.074	ND	0.15	45	--
920924-SS2-3	09/24/92		600	S	ND	ND	ND	0.038	19	--
920924-SS2-4	09/24/92		600	S	ND	ND	ND	ND	6	--
920924-SS2-5	09/24/92		5,000	S	ND	0.28	0.15	0.89	210	--
920924-SS2-6	09/24/92		8,700	S	ND	1.2	0.35	5.4	260	--
921116-1	11/16/92	680	<100	S	ND	0.051	ND	0.23	28	--
921116-2	11/16/92		<100	S	ND	ND	ND	ND	160	--
921116-3	11/16/92		<100	S	ND	0.048	ND	0.062	120	--
921116-4	11/16/92		<100	S	ND	ND	ND	0.033	92	--
921116-5	11/16/92		<100	S	ND	ND	ND	ND	16	--
921116-6	11/16/92		<100	S	ND	ND	ND	ND	16	--
921125-7 ⁵	11/25/92	20	<100	S	ND	0.051	ND	0.46	83	7,100
MTCA Method A Cleanup Levels					0.5	20	40	20	100	200

Notes:

¹Chemical analyses were conducted by Analytical Technologies, Inc. Laboratory reports are presented in Appendix B.

²Field screening methods are described in Appendix A. Combustible headspace vapors were measured with a Bacharach TLV Sniffer calibrated to hexane.

NS = no sheen, S = sheen.

³B = benzene, E = ethylbenzene, T = toluene, X = total xylenes.

⁴Soil used to backfill excavation on October 27, 1992.

⁵Oil-range hydrocarbons were qualitatively identified in this sample using Washington TPH-HCID (hydrocarbon identification) by Ecology-specified methodology.

ppm = parts per million; mg/kg = milligrams per kilogram; ND = not detected; detection limits are presented in laboratory reports in Appendix B.

TABLE 4
SUMMARY OF SOIL ANALYTICAL DATA¹
AERATED STOCKPILE SAMPLES

Sample Number ²	Date Sampled	Stockpile Volume (cubic yards)	Field Screening Results ²		Volatile Aromatic Hydrocarbons ³ (EPA Method 8020) (mg/kg)				Gasoline-range Hydrocarbons Ecology Method WTPH-G) (mg/kg)
			Headspace Vapors (ppm)	Sheen	B	E	T	X	
921027-AS1	10/27/92	100 ⁴	<100	S	ND	ND	ND	ND	ND
921027-AS2	10/27/92		<100	S	ND	ND	ND	ND	ND
921027-AS3D	10/27/92	200	2,000	S	--	--	--	--	230
921027-AS4D	10/27/92		6,000	S	--	--	--	--	1,000
921027-AS5	10/27/92		400	S	--	--	--	--	120
MTCA Method A Cleanup Levels					0.5	20	40	20	100

Notes:

¹Chemical analyses were conducted by Analytical Technologies, Inc. Laboratory reports are presented in Appendix B.

²Field screening methods are described in Appendix A. Combustible headspace vapors were measured with a Bacharach TLV Sniffer calibrated to hexane.

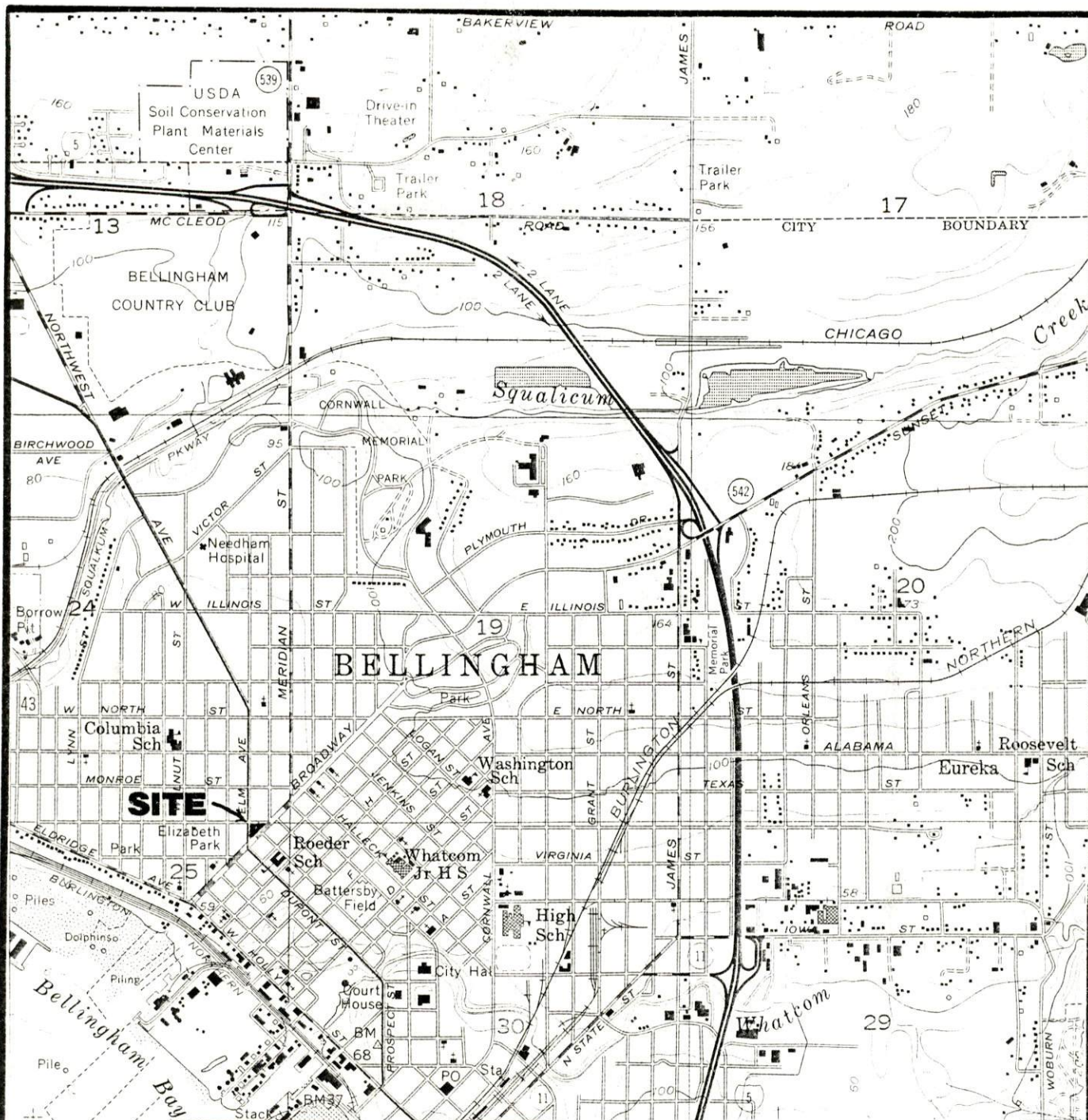
NS = no sheen, S = Sheen.

³B = benzene, E = ethylbenzene, T = toluene, X = total xylenes.

⁴Soil used to backfill excavation on November 11, 1992.

ppm = parts per million; mg/kg = milligrams per kilogram; ND = not detected; detection limits are presented in laboratory reports in Appendix B.

"--" = not tested



0 2000 4000
SCALE IN FEET



REFERENCE: USGS 7.5' TOPOGRAPHIC QUADRANGLE MAP
ENTITLED "BELLINGHAM NORTH" DATED 1973.

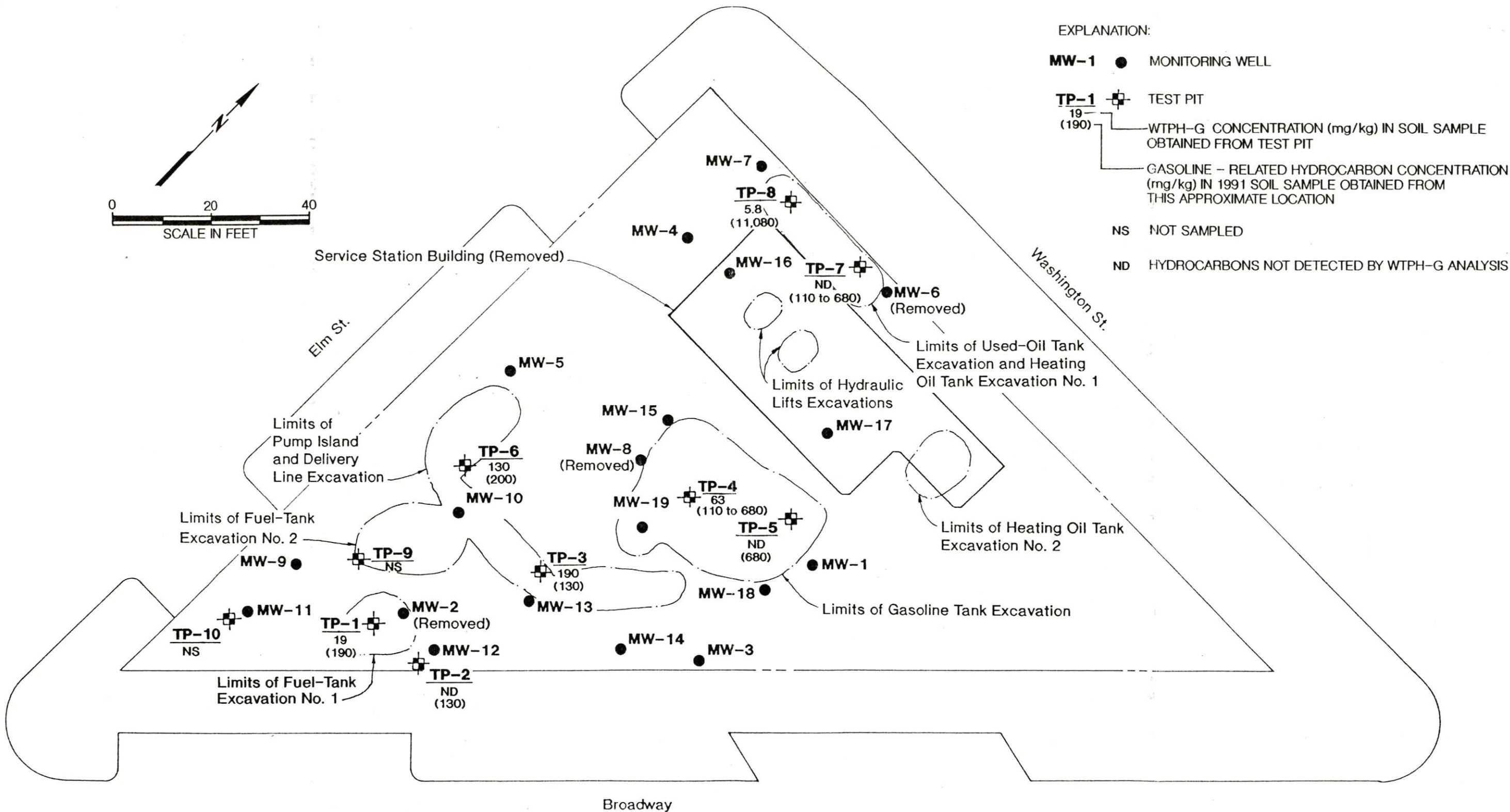
Geo  Engineers

SITE LOCATION MAP
Decommissioned Service Station 60090619
Broadway & Elm Streets
Bellingham, Washington

FIGURE
1

0372 - D80-B04 EJM:RRR 11-21-90
Rev. 2-13-92 KRF:KKT

372-80-804 KRF:BDH 11.2.90 (8)
Rev. DOK:ANG 12.14.92



Notes: 1. MW-2, MW-6 and MW-8 were removed during underground storage tank removal in January 1991.

2. The locations of all features shown are approximate.

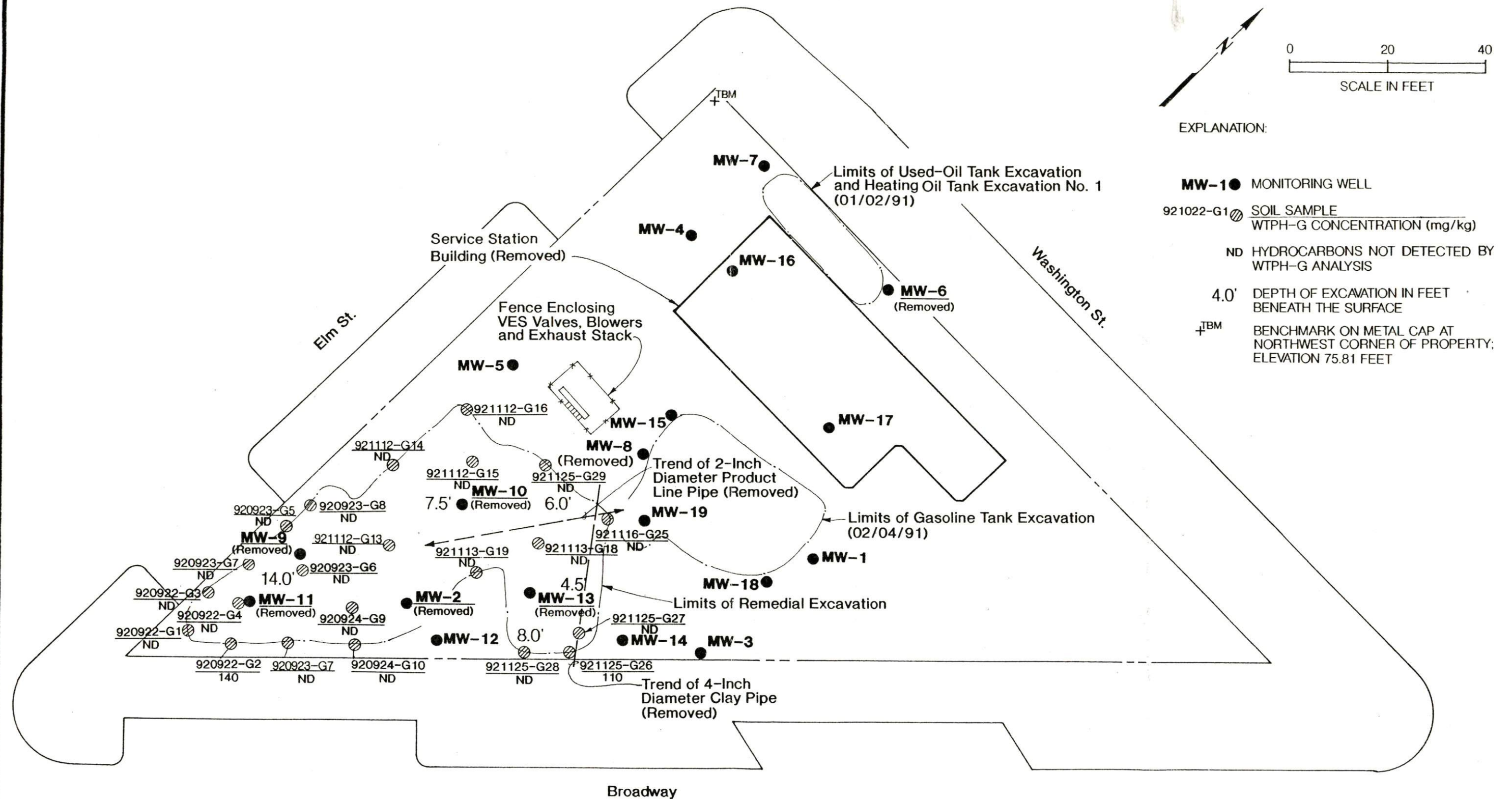
REFERENCE: DRAWING ENTITLED "GROUND PLAN, DEALER OPERATED SS 0619, BROADWAY & ELM, BELLINGHAM, WASHINGTON," BY STANDARD OIL CO. OF CALIFORNIA, DATED 03/12/68.

Geo  Engineers

TEST PIT LOCATIONS
Decommissioned Service Station 60090619
Broadway & Elm Streets
Bellingham, Washington

FIGURE
2

Rev. DDK:ZJD 12/21/92
372-80-804 KRF:BDH 11.2.90 (B)



EXPLANATION:

- MW-1** ● MONITORING WELL
- 921022-G1 ● SOIL SAMPLE
WTPH-G CONCENTRATION (mg/kg)
- ND HYDROCARBONS NOT DETECTED BY
WTPH-G ANALYSIS
- 4.0' DEPTH OF EXCAVATION IN FEET
BENEATH THE SURFACE
- +TBM BENCHMARK ON METAL CAP AT
NORTHWEST CORNER OF PROPERTY;
ELEVATION 75.81 FEET

- Notes: 1. MW-2, MW-6 and MW-8 were removed during underground storage tank removal in January 1991.
2. MW-9, MW-10, MW-11 and MW-13 were removed during the remedial excavation activities.
3. The locations of all features shown are approximate.

REFERENCE: DRAWING ENTITLED "GROUND PLAN, DEALER OPERATED
SS 0619, BROADWAY & ELM, BELLINGHAM, WASHINGTON,"
BY STANDARD OIL CO. OF CALIFORNIA, DATED 03/12/68.

Geo  Engineers

REMEDIAL EXCAVATION
Decommissioned Service Station 60090619
Broadway & Elm Streets
Bellingham, Washington

FIGURE
3

APPENDIX A

APPENDIX A

FIELD EXPLORATIONS

SOIL SAMPLING PROCEDURES

Sleister (A.L. Sleister and Sons Construction Inc.) performed test pit and remedial excavations between September and November 1992 using various backhoe trackhoe excavators. A geologist from our staff documented soil conditions encountered during test pit and remedial excavation monitoring activities and selected the soil sample locations. Soil encountered in the test pits was classified in accordance with ASTM D2488-90 as presented in Figure A-1. Test pit logs (TP-1 through TP-10) are included in Figures A-2 through A-5. Test pit soil samples selected for chemical analysis are indicated with "CA" on the test pit logs.

Discrete soil samples were obtained from the excavation. Discrete samples also were obtained from the resulting soil stockpiles. Soil samples either were obtained directly from the excavations and stockpiles using a stainless steel spoon, or were obtained with the aid of the contractor's excavation equipment. Samples retrieved with the contractor's equipment were obtained from the center of the excavator or backhoe bucket using a stainless steel spoon. The spoon was decontaminated before each sampling attempt with an Alconox solution wash and a distilled water rinse.

Each sample obtained from a test pit, excavation or stockpile was separated into two portions. The first portion was placed in a plastic sample bag for field screening. The second portion was transferred to a laboratory-prepared sample jar. The samples selected for chemical analysis were placed in a cooler with ice or blue ice and packing material for transportation to the testing laboratory. Chain-of-custody procedures were followed during the transportation of the samples to the laboratory.

FIELD SCREENING PROCEDURES

Soil samples obtained from the excavations, test pits and stockpiles were screened in the field for evidence of petroleum hydrocarbons using (1) visual examination, (2) water sheen screening and (3) headspace vapor screening using a Bacharach TLV Sniffer calibrated to hexane. Field screening results are used as a general guideline to delineate areas of soil possibly containing petroleum hydrocarbons. In addition, field screening results are used to aid in the selection of soil samples for chemical analysis. The results of headspace and sheen screening are included in Tables 1 through 4.

Visual screening consists of inspecting the soil for stains indicative of soil containing petroleum hydrocarbons. Visual screening is generally more effective when the hydrocarbons present are related to heavy petroleum hydrocarbons such as motor oil or when hydrocarbon concentrations are high.

Water sheen screening and headspace vapor screening are more sensitive methods that have been effective in detecting petroleum hydrocarbon concentrations less than regulatory cleanup guidelines. Water sheen screening involves placing soil in water and observing the water surface for signs of sheen. Sheen classifications are as follows:

No Sheen (NS)

No visible sheen on water surface

Sheen (S)

Visible sheen on water surface

Headspace vapor screening involves placing a soil sample in a plastic sample bag. Air is captured in the bag and the bag is shaken to expose the soil to the air trapped in the bag. The probe of a Bacharach TLV Sniffer is inserted into the sealed bag and the TLV Sniffer measures the concentration of combustible vapor in the sample headspace. The TLV Sniffer measure concentrations in ppm (parts per million) and is calibrated to hexane. The TLV Sniffer is designed to quantify combustible gas concentrations in the range between 100 and 10,000 ppm in this application.

Field screening results are site- and sample location-specific. The results vary with temperature, soil type, soil moisture content and type of hydrocarbon.

SOIL CLASSIFICATION SYSTEM

MAJOR DIVISIONS			GROUP SYMBOL	GROUP NAME
COARSE GRAINED SOILS MORE THAN 50% RETAINED ON NO. 200 SIEVE	GRAVEL MORE THAN 50% OF COARSE FRACTION RETAINED ON NO. 4 SIEVE	CLEAN GRAVEL	GW	WELL-GRADED GRAVEL, FINE TO COARSE GRAVEL
			GP	POORLY-GRADED GRAVEL
		GRAVEL WITH FINES	GM	SILTY GRAVEL
			GC	CLAYEY GRAVEL
	SAND MORE THAN 50% OF COARSE FRACTION PASSES NO. 4 SIEVE	CLEAN SAND	SW	WELL-GRADED SAND, FINE TO COARSE SAND
			SP	POORLY-GRADED SAND
		SAND WITH FINES	SM	SILTY SAND
			SC	CLAYEY SAND
FINE GRAINED SOILS MORE THAN 50% PASSES NO. 200 SIEVE	SILT AND CLAY LIQUID LIMIT LESS THAN 50	INORGANIC	ML	SILT
			CL	CLAY
		ORGANIC	OL	ORGANIC SILT, ORGANIC CLAY
			SILT AND CLAY LIQUID LIMIT 50 OR MORE	INORGANIC
	CH	CLAY OF HIGH PLASTICITY, FAT CLAY		
	ORGANIC	OH		ORGANIC CLAY, ORGANIC SILT
		HIGHLY ORGANIC SOILS		PT

NOTES:

1. Field classification is based on visual examination of soil in general accordance with ASTM D2488-90.
2. Soil classification using laboratory tests is based on ASTM D2487-90.
3. Descriptions of soil density or consistency are based on interpretation of blowcount data, visual appearance of soils, and/or test data.

SOIL MOISTURE MODIFIERS:

- Dry - Absence of moisture, dusty, dry to the touch
- Moist - Damp, but no visible water
- Wet - Visible free water or saturated, usually soil is obtained from below water table

Test Pit Number	Sample Depth (feet)	Field Screening Results		Classification Symbol	Soil Description
		Headspace Vapors (ppm)	Water Sheen		
TP-1	1.0	<100	S	ML GW	0.0 - 0.5 6 inches asphalt concrete 0.5 - 10.0 Brownish gray silt with occasional gravel (medium stiff, moist) (fill) 10.0 - 11.5 Brown to gray fine to coarse gravel with medium sand and a trace of silt (medium dense, wet) Test pit completed at 11.5 feet on 09/15/92 Ground water encountered at approximately 10 feet
	2.0	<100	S		
	3.0	<100	S		
	4.0	<100	S		
	5.0	<100	S		
	6.0	110	S		
	7.0	110	S		
	8.0	<100	S		
	9.0	<100	S		
	10.0	110	S		
	11.0	200	S		
	11.5 (CA)	160	S		
TP-2	1.0	<100	S	SP ML SP	0.0 - 0.5 6 inches asphalt concrete 0.5 - 3.5 Brown medium to coarse sand with gravel and a trace of silt (loose, moist) (fill) 3.5 - 9.0 Brownish gray silt (stiff, moist) 9.0 - 10.0 Gray fine sand with occasional gravel (medium dense, moist) Test pit completed at 10.0 feet on 09/15/92 No ground water encountered
	2.0	100	S		
	3.0	<100	S		
	4.0	110	S		
	5.0	<100	S		
	6.0	<100	S		
	7.0	140	NS		
	8.0	<100	S		
	8.5 (CA)	<100	S		
	9.0	210	S		
	10.0	<100	S		

Refer to Figure A-1 and Appendix A for explanation of symbols.

Test Pit Number	Sample Depth (feet)	Field Screening Results		Classification Symbol	Soil Description
		Headspace Vapors (ppm)	Water Sheen		
TP-3	1.0	<100	S	GP	0.0 - 3.0 Gray fine to coarse gravel with medium to coarse sand and silt (loose, moist) (fill)
	2.0	<100	S	ML	3.0 - 9.0 Brownish gray sandy silt (medium stiff, moist)
	3.0	140	S		Test pit completed at 9.0 feet on 09/15/92
	4.0 (CA)	<100	S		No ground water encountered
	5.0	<100	S		
	6.0	160	NS		
	7.0	540	NS		
	8.0 (CA)	1,100	NS		
	9.0 (CA)	<100	S		
TP-4	1.0	<100	S	SM	0.0 - 3.0 Tan silty fine to medium sand with occasional gravel (medium dense, moist) (fill)
	2.0	<100	S	GM	3.0 - 4.0 Sandy gravel with silt and occasional asphalt (fill)
	3.0	<100	S		4.0 - 8.0 Brownish gray silty fine gravel with sand and occasional cobbles (dense, moist) (fill)
	4.0	<100	S		Test pit completed at 8.0 feet on 09/16/92
	5.0	<100	S		No ground water encountered
	6.0	200	S		
	7.0	160	S		
	8.0 (CA)	600	S		
TP-5	1.0	<100	S	GP	0.0 - 4.0 Brown silty fine gravel with fine sand (medium dense, moist) (fill)
	2.0	<100	S	SP-SM	4.0 - 8.0 Brownish tan fine to medium sand with silt and occasional gravel (loose, moist) (fill)
	3.0	<100	S		Test pit completed at 8.0 feet on 09/16/92
	4.0	<100	S		No ground water encountered
	5.0	<100	S		
	6.0	<100	S		
	7.0	<100	S		
	8.0 (CA)	<100	S		

Refer to Figure A-1 and Appendix A for explanation of symbols.

Test Pit Number	Sample Depth (feet)	Field Screening Results		Classification Symbol	Soil Description
		Headspace Vapors (ppm)	Water Sheen		
TP-6	1.0	<100	S	GP-GM	0.0 - 2.0 Brown sandy gravel with silt (medium dense, moist) (fill)
	2.0	<100	S	ML	2.0 - 8.0 Brown silt with medium to coarse sand and gravel (loose, moist) (fill)
	3.0	<100	S	GM	8.0 - 8.5 Gray silty fine gravel with sand (dense, moist)
	4.0 (CA)	<100	S		Test pit completed at 8.5 feet on 09/16/92
	5.0	<100	S		No ground water encountered
	6.0	<100	S		
	7.0	<100	S		
	8.0 (CA)	240	S		
	8.5 (CA)	<100	NS		
TP-7	1.0	<100	NS	SM	0.0 - 6.5 Brown silty medium to coarse sand with gravel (loose to dense, moist) (fill)
	2.0	<100	S	SM	6.5 - 9.0 Brown silty fine to medium sand (loose, moist)
	3.0	<100	S	SP	9.0 - 10.0 Brown to tan medium to coarse sand with fine gravel and a trace of silt (loose, wet)
	4.0	<100	NS		Test pit completed at 10.0 feet on 09/16/92
	5.0	<100	NS		Ground water encountered at 9.0 feet
	6.0	<100	NS		
	7.0	<100	S		
	8.0	<100	S		
	9.0 (CA)	<100	S		
	10.0	<100	NS		
TP-8	1.0	<100	S	SM	0.0 - 7.5 Brownish gray silty fine to coarse sand with occasional gravel (loose to dense, moist)
	2.0	<100	S	SM	7.5 - 8.0 Gray silty sand silt with occasional gravel (dense, moist)
	3.0	<100	S		Test pit completed at 8.0 feet on 09/16/92
	4.0	<100	NS		No ground water encountered
	5.0	<100	S		
	6.0 (CA)	<100	S		
	7.0	<100	S		
	8.0 (CA)	<100	S		

Refer to Figure A-1 and Appendix A for explanation of symbols.

Test Pit Number	Sample Depth (feet)	Field Screening Results		Classification Symbol	Soil Description
		Headspace Vapors (ppm)	Water Sheen		
TP-9	1.0	<100	S	SP-SM	0.0 - 5.0 Brown medium to coarse sand with silt and occasional gravel (loose, moist) (fill)
	2.0	<100	S	SM	5.0 - 6.5 Brownish tan silty fine sand with occasional gravel (loose, moist) (fill)
	3.0	<100	S	ML	6.5 - 7.0 Gray sandy silt with occasional gravel (stiff, moist)
	4.0	<100	NS	SM	7.0 - 8.5 Tan silty medium to coarse sand with occasional gravel (dense, moist)
	5.0	<100	NS		8.5 - 9.0 Gray silty medium to coarse sand with occasional gravel (dense, wet)
	6.0	<100	S		Test pit completed at 9.0 feet on 09/16/92
	6.5	1,200	S		Ground water encountered at 8.5 feet
	7.0	<100	S		
	8.0	<100	S		
	9.0	<100	NS		
TP-10	1.0	<100	S		0.0 - 0.5 6 inches asphalt concrete
	2.0	<100	S	SM	0.5 - 3.0 Brownish gray silty sand with occasional gravel (soft, moist) (fill)
	3.0	<100	NS	ML	3.0 - 11.0 Brown silt with fine sand (medium stiff, moist)
	4.0	<100	NS	SP	11.0 - 11.5 Dark gray fine to medium sand with occasional fine gravel and a trace of silt (loose, wet)
	5.0	<100	NS		
	6.0	<100	NS	GM	11.5 - 12.0 Tan to brown silty coarse gravel with sand (medium dense, wet)
	6.5	<100	NS		Test pit completed at 12.0 feet on 09/17/92
	7.0	<100	NS		Ground water encountered at 11.0 feet
	8.0	<100	S		
	9.0	<100	NS		
	10.0	<100	S		
	10.5	<100	S		
	11.0	<100	S		
	11.5	>10,000	S		
	12.0	<100	S		

Refer to Figure A-1 and Appendix A for explanation of symbols.

APPENDIX B

APPENDIX B

CHEMICAL ANALYTICAL PROGRAM

ANALYTICAL METHODS

Chain-of-custody procedures were followed during transport of the soil samples to the analytical laboratory. The samples were held in cold storage pending extraction and/or analysis. Fifty-nine soil samples were analyzed by ATI (Analytical Technologies, Inc.) of Renton, Washington. The samples were analyzed using one or more of the following methods:

<u>Analyte</u>	<u>Technique/Equipment</u>	<u>Method</u>
Hydrocarbon Identification	Gas Chromatography/ Flame Ionization Detector	Ecology WTPH-HCID
Gasoline-range Hydrocarbons	Gas Chromatography/ Flame Ionization Detector	Ecology WTPH-G
Diesel-range Hydrocarbons	Gas Chromatography/ Flame Ionization Detector	Ecology WTPH-D
Aromatic Volatile Organic Compounds	Gas Chromatography/ Photoionization Detector	EPA 8020

Analytical results and laboratory QA/QC (quality assurance/quality control) records are included in this appendix. The analytical results are also summarized in the text and Tables 1 through 4 of this report.

ANALYTICAL DATA REVIEW

Data Quality Goals

ATI maintains an internal quality assurance program as documented in its laboratory quality assurance manual. ATI uses a combination of blanks, surrogate percent recovery, duplicates, matrix spike recovery and matrix spike duplicate recovery to evaluate the validity of analytical results. ATI also uses data quality goals for individual chemicals or groups of chemicals based on the long-term performance of the test methods. The data quality goals were supplied by the laboratory. Each group of samples was compared with the existing data quality goals for the laboratory and evaluated using data validation guidelines from the following documents: "Guidance Document for the Assessment of RCRA Environmental Data Quality," Draft dated 1988; "National Functional Guidelines for Organic Data Review," Draft dated 1991; and "Laboratory Data Validation Functional Guidelines for Evaluating Inorganics Analyses," dated 1988. The data quality review is presented below.

Data Quality Review

Surrogates. Surrogates were added to all soil samples prior to extraction and analysis for organic compounds to monitor sample handling procedures, matrix effects and purging efficiency. All surrogate recoveries were within the recommended control limits.

Matrix Spike/Matrix Spike Duplicates (MS/MSD). Matrix spikes and matrix spike duplicates were analyzed during most of the organic tests to monitor matrix effects. When MS/MSD recoveries were not available, the laboratory provided blank spikes (BS). Any MS/MSD or BS recoveries that were outside the control limits are summarized below.

Duplicates/Matrix Spikes. Duplicates and matrix spikes were analyzed during the organic tests to monitor matrix effects and method reproducibility. Any spike recoveries or relative percent differences (RPDs) that were outside the control limits are summarized below.

Holding Times. All soil samples were extracted and analyzed within the recommended holding times except for two samples. These exceptions are summarized below.

Blanks. Laboratory blanks were analyzed for analytes that may have been introduced during sample analysis. Analytes were not detected in the laboratory method blanks.

Data Quality Exceptions

The following is the list of nonconformances noted during the data quality review:

<u>Analyte/Sample Number</u>	<u>Data Quality Problem</u>	<u>Evaluation</u>
8020 920923-SS2 920923-SS3	Analyzed 5 days past the recommended holding time.	Detection limits or concentration presented for these samples may be biased low and should be quantified as estimated.
8020 920923-G5 920923-G6 920923-G7 920923-G8 920923-SS1 920923-SS2 920923-SS3 920923-SS4	Benzene and ethylbenzene in the MS and MSD were below control limits.	Matrix interference was confirmed to be the result of the presence of high concentrations of the compound of interest on a nonproject sample. BS and BSD met QA/QC criteria. The MS and MSD were reextracted and analyzed. All QC met criteria.

<u>Analyte/Sample Number</u>	<u>Data Quality Problem</u>	<u>Evaluation</u>
8020	Total xylenes in the MSD	Matrix interference was
920923-G5	was below control limits.	confirmed to be the result of
920923-G6		the presence of high
920923-G7		concentrations of the
920923-G8		compound of interest on a
920923-SS1		nonproject sample. The
920923-SS2		amount spiked was
920923-SS3		insufficient to be quantified
920923-SS4		against the background
		xylenes already in the soil
		sample. The BS and BSD
		met QC criteria.

SUMMARY

The analytical results from this project were reviewed for conformance with the data quality goals. Limited data quality problems were encountered in the BETX analyses for this project listed above.

Holding time was exceeded during two BETX analyses. The results for these analyses may be biased low. WTPH-G analyses for the two samples indicated that gasoline-range hydrocarbon concentrations were much less than the cleanup level. BETX concentrations typically have not exceeded cleanup levels in soil samples obtained from this site if corresponding WTPH-G concentrations are less than cleanup levels. Therefore, it is likely that original concentrations of BETX in these two samples did not exceed cleanup levels.

Other problems included matrix spike recoveries and RPDs outside of control limits or nonproject samples. The results of benzene and ethylbenzene in the MS and MSD for samples 920923-G5 through -G8 and 920923-SS1 through -SS4 were below the established control limits in the MSD; however, the BS and BSD met QC criteria. The sample MS and MSD were reextracted and analyzed on October 8, 1992 and all QC criteria were met. The total xylenes results in the MS and MSD for samples 920923-G5 through -G8 and 920923-SS1 through -SS4 were below the established control limits and were confirmed to be the result of matrix interference. Acceptable method performance was demonstrated through satisfactory blank spike results.

It is our opinion that the quality of chemical analytical data used to form conclusions in this report is acceptable based on our review of the ATI results and associated quality control parameters.



Analytical **Technologies, Inc.**

560 Naches Avenue, S.W., Suite 101, Renton, WA 98055 (206) 228-8335

ATI I.D. # 9209-142

September 30, 1992

GeoEngineers

GeoEngineers, Inc.
8410 154th Avenue
Redmond, WA 98052

OCT 01 1992

Routing

File

Attention : Kurt Fraese

Project Number : 0372-080-R04

Project Name : Chevron - Bellingham

On September 16, 1992, Analytical Technologies, Inc., received five soil samples for analysis. The samples were analyzed with EPA methodology or equivalent methods as specified in the attached analytical schedule. The results, sample cross reference, and quality control data are enclosed.


Donna M. McKinney
Senior Project Manager


Frederick W. Grothkopp
Laboratory Manager

FWG/hal/hbb



ATI I.D. # 9209-142

SAMPLE CROSS REFERENCE SHEET

CLIENT : GEOENGINEERS, INC.
PROJECT # : 0372-080-R04
PROJECT NAME : CHEVRON - BELLINGHAM

ATI #	CLIENT DESCRIPTION	DATE SAMPLED	MATRIX
9209-142-1	920915-TP1	09/15/92	SOIL
9209-142-2	920915-TP2	09/15/92	SOIL
9209-142-3	920915-TP3	09/15/92	SOIL
9209-142-4	920915-TP3-2	09/15/92	SOIL
9209-142-5	920915-TP3-3	09/15/92	SOIL

----- TOTALS -----

MATRIX	# SAMPLES
SOIL	5

ATI STANDARD DISPOSAL PRACTICE

The samples from this project will be disposed of in thirty (30) days from the date of the report. If an extended storage period is required, please contact our sample control department before the scheduled disposal date.

ATI I.D. # 9209-142

QUALITY CONTROL
INFORMATION

CLIENT : GEOENGINEERS, INC.
PROJECT # : 0372-080-R04
PROJECT NAME : CHEVRON - BELLINGHAM

BETX

DETECTION LIMITS

	WATER	SOIL
Benzene	0.0005 mg/L	0.025 mg/Kg
Toluene	0.0005 mg/L	0.025 mg/Kg
Ethyl Benzene	0.0005 mg/L	0.025 mg/Kg
Xylenes	0.0005 mg/L	0.025 mg/Kg

CONTROL LIMITS

	WATER	RPD	SOIL	RPD
BLANK SPIKE				
Benzene	82-114	20	65-111	20
Toluene	81-116	20	70-119	20
Xylenes	75-120	20	72-119	20
MATRIX SPIKE				
Benzene	75-112	20	50-97	20
Toluene	71-122	20	53-105	20
Xylenes	70-117	20	60-105	20

8015 MODIFIED

DETECTION LIMITS

QUANTITATION RANGE	WATER	SOIL
C7 - C12	1 mg/L	5 mg/Kg
C12 - C24	1 mg/L	25 mg/Kg

CONTROL LIMITS

	WATER	RPD	SOIL	RPD
BLANK SPIKE				
Fuel Hydrocarbons	57-111	20	76-132	20
MATRIX SPIKE				
Fuel Hydrocarbons	63-118	20	58-141	20



ATI I.D. # 9209-142

ANALYTICAL SCHEDULE

CLIENT : GEOENGINEERS, INC.
PROJECT # : 0372-080-R04
PROJECT NAME : CHEVRON - BELLINGHAM

ANALYSIS	TECHNIQUE	REFERENCE	LAB
BETX	GC/PID	EPA 8020	R
TOTAL PETROLEUM HYDROCARBONS	GC/FID	WA DOE WTPH-G	R
MOISTURE	GRAVIMETRIC	CLP SOW ILMO1.0	R

R = ATI - Renton
SD = ATI - San Diego
PHX = ATI - Phoenix
PNR = ATI - Pensacola
FC = ATI - Fort Collins
SUB = Subcontract

ATI I.D. # 9209-142

VOLATILE ORGANIC COMPOUNDS
DATA SUMMARY

CLIENT : GEOENGINEERS, INC.
PROJECT # : 0372-080-R04
PROJECT NAME : CHEVRON - BELLINGHAM
CLIENT I.D. : REAGENT BLANK
SAMPLE MATRIX : SOIL
EPA METHOD : 8020 (BETX)
RESULTS ARE CORRECTED FOR MOISTURE CONTENT

DATE SAMPLED : N/A
DATE RECEIVED : N/A
DATE EXTRACTED : 09/23/92
DATE ANALYZED : 09/23/92
UNITS : mg/Kg
DILUTION FACTOR : 1

COMPOUND	MDL	RESULT
BENZENE	0.025	ND
ETHYLBENZENE	0.025	ND
TOLUENE	0.025	ND
TOTAL XYLENES	0.025	ND

SURROGATE PERCENT RECOVERY

BROMOFLUOROBENZENE 94

ATI I.D. # 9209-142-1

VOLATILE ORGANIC COMPOUNDS
DATA SUMMARY

CLIENT	: GEOENGINEERS, INC.	DATE SAMPLED	: 09/15/92
PROJECT #	: 0372-080-R04	DATE RECEIVED	: 09/16/92
PROJECT NAME	: CHEVRON - BELLINGHAM	DATE EXTRACTED	: 09/23/92
CLIENT I.D.	: 920915-TP1	DATE ANALYZED	: 09/24/92
SAMPLE MATRIX	: SOIL	UNITS	: mg/Kg
EPA METHOD	: 8020 (BETX)	DILUTION FACTOR	: 1

RESULTS ARE CORRECTED FOR MOISTURE CONTENT

COMPOUND	MDL	RESULT
BENZENE	0.028	ND
ETHYLBENZENE	0.028	ND
TOLUENE	0.028	ND
TOTAL XYLENES	0.028	0.029

SURROGATE PERCENT RECOVERY

BROMOFLUOROBENZENE	90
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ATI I.D. # 9209-142-2

VOLATILE ORGANIC COMPOUNDS
DATA SUMMARY

CLIENT	: GEOENGINEERS, INC.	DATE SAMPLED	: 09/15/92
PROJECT #	: 0372-080-R04	DATE RECEIVED	: 09/16/92
PROJECT NAME	: CHEVRON - BELLINGHAM	DATE EXTRACTED	: 09/23/92
CLIENT I.D.	: 920915-TP2	DATE ANALYZED	: 09/24/92
SAMPLE MATRIX	: SOIL	UNITS	: mg/Kg
EPA METHOD	: 8020 (BETX)	DILUTION FACTOR	: 1
RESULTS ARE CORRECTED FOR MOISTURE CONTENT			

COMPOUND	MDL	RESULT
BENZENE	0.028	ND
ETHYLBENZENE	0.028	ND
TOLUENE	0.028	ND
TOTAL XYLENES	0.028	ND

SURROGATE PERCENT RECOVERY

BROMOFLUOROBENZENE	86
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ATI I.D. # 9209-142-3

VOLATILE ORGANIC COMPOUNDS
DATA SUMMARY

CLIENT : GEOENGINEERS, INC.
PROJECT # : 0372-080-R04
PROJECT NAME : CHEVRON - BELLINGHAM
CLIENT I.D. : 920915-TP3
SAMPLE MATRIX : SOIL
EPA METHOD : 8020 (BETX)
RESULTS ARE CORRECTED FOR MOISTURE CONTENT

DATE SAMPLED : 09/15/92
DATE RECEIVED : 09/16/92
DATE EXTRACTED : 09/23/92
DATE ANALYZED : 09/24/92
UNITS : mg/Kg
DILUTION FACTOR : 1

COMPOUND	MDL	RESULT
BENZENE	0.030	ND
ETHYLBENZENE	0.030	ND
TOLUENE	0.030	ND
TOTAL XYLENES	0.030	ND

SURROGATE PERCENT RECOVERY

BROMOFLUOROBENZENE 85

ATI I.D. # 9209-142-4

VOLATILE ORGANIC COMPOUNDS
DATA SUMMARY

CLIENT : GEOENGINEERS, INC.
PROJECT # : 0372-080-R04
PROJECT NAME : CHEVRON - BELLINGHAM
CLIENT I.D. : 920915-TP3-2
SAMPLE MATRIX : SOIL
EPA METHOD : 8020 (BETX)
RESULTS ARE CORRECTED FOR MOISTURE CONTENT

DATE SAMPLED : 09/15/92
DATE RECEIVED : 09/16/92
DATE EXTRACTED : 09/23/92
DATE ANALYZED : 09/24/92
UNITS : mg/Kg
DILUTION FACTOR : 1

COMPOUND	MDL	RESULT
BENZENE	0.032	ND
ETHYLBENZENE	0.032	0.11
TOLUENE	0.032	ND
TOTAL XYLENES	0.032	0.30

SURROGATE PERCENT RECOVERY

BROMOFLUOROBENZENE 93



ATI I.D. # 9209-142-5

VOLATILE ORGANIC COMPOUNDS
DATA SUMMARY

CLIENT : GEOENGINEERS, INC.
PROJECT # : 0372-080-R04
PROJECT NAME : CHEVRON - BELLINGHAM
CLIENT I.D. : 920915-TP3-3
SAMPLE MATRIX : SOIL
EPA METHOD : 8020 (BETX)
RESULTS ARE CORRECTED FOR MOISTURE CONTENT

DATE SAMPLED : 09/15/92
DATE RECEIVED : 09/16/92
DATE EXTRACTED : 09/23/92
DATE ANALYZED : 09/24/92
UNITS : mg/Kg
DILUTION FACTOR : 1

COMPOUND	MDL	RESULT
BENZENE	0.028	ND
ETHYLBENZENE	0.028	ND
TOLUENE	0.028	ND
TOTAL XYLENES	0.028	ND

SURROGATE PERCENT RECOVERY

BROMOFLUOROBENZENE	83
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ATI I.D. # 9209-142

VOLATILE ORGANIC COMPOUNDS
QUALITY CONTROL DATA

CLIENT : GEOENGINEERS, INC.
PROJECT # : 0372-080-R04
PROJECT NAME : CHEVRON - BELLINGHAM
EPA METHOD : 8020 (BETX)

SAMPLE I.D. : 9209-142-5
DATE EXTRACTED : 09/23/92
DATE ANALYZED : 09/24/92
MATRIX : SOIL
UNITS : mg/Kg

COMPOUND	SAMPLE RESULT	SPIKE ADDED	SPIKED SAMPLE	% REC	DUP SPIKED SAMPLE	DUP % REC	RPD
BENZENE	ND	1.00	0.748	75	0.800	80	7
TOLUENE	ND	1.00	0.808	81	0.855	86	6
TOTAL XYLENES	ND	2.00	1.61	81	1.67	84	4

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative \% Difference)} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 100$$



ATI I.D. # 9209-142

VOLATILE ORGANIC COMPOUNDS
QUALITY CONTROL DATA

CLIENT : GEOENGINEERS, INC.
PROJECT # : 0372-080-R04
PROJECT NAME : CHEVRON - BELLINGHAM
EPA METHOD : 8020 (BETX)

SAMPLE I.D. : BLANK SPIKE
DATE EXTRACTED : 09/23/92
DATE ANALYZED : 09/23/92
MATRIX : SOIL
UNITS : mg/Kg

COMPOUND	SAMPLE RESULT	SPIKE ADDED	SPIKED SAMPLE	% REC	DUP SPIKED SAMPLE	DUP % REC	RPD
BENZENE	ND	1.00	0.922	92	0.895	90	3
TOLUENE	ND	1.00	0.980	98	0.945	95	4
TOTAL XYLENES	ND	2.00	1.91	96	1.89	95	1

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative \% Difference)} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 100$$



ATI I.D. # 9209-142

TOTAL PETROLEUM HYDROCARBON ANALYSIS
DATA SUMMARY

CLIENT	: GEOENGINEERS, INC.	DATE SAMPLED	: N/A
PROJECT #	: 0372-080-R04	DATE RECEIVED	: N/A
PROJECT NAME	: CHEVRON - BELLINGHAM	DATE EXTRACTED	: 09/23/92
CLIENT I.D.	: REAGENT BLANK	DATE ANALYZED	: 09/23/93
SAMPLE MATRIX	: SOIL	UNITS	: mg/Kg
METHOD	: WA DOE WTPH-G	DILUTION FACTOR	: 1

RESULTS ARE CORRECTED FOR MOISTURE CONTENT

COMPOUND	MDL	RESULT
FUEL HYDROCARBONS	5	ND
HYDROCARBON RANGE		TOLUENE TO DODECANE
HYDROCARBON QUANTITATION USING		GASOLINE

SURROGATE PERCENT RECOVERY

TRIFLUOROTOLUENE	100
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ATI I.D. # 9209-142-1

TOTAL PETROLEUM HYDROCARBON ANALYSIS
DATA SUMMARY

CLIENT	: GEOENGINEERS, INC.	DATE SAMPLED	: 09/15/92
PROJECT #	: 0372-080-R04	DATE RECEIVED	: 09/16/92
PROJECT NAME	: CHEVRON - BELLINGHAM	DATE EXTRACTED	: 09/23/92
CLIENT I.D.	: 920915-TP1	DATE ANALYZED	: 09/24/93
SAMPLE MATRIX	: SOIL	UNITS	: mg/Kg
METHOD	: WA DOE WTPH-G	DILUTION FACTOR	: 1

RESULTS ARE CORRECTED FOR MOISTURE CONTENT

COMPOUND	MDL	RESULT
FUEL HYDROCARBONS	6	19
HYDROCARBON RANGE		TOLUENE TO DODECANE
HYDROCARBON QUANTITATION USING		GASOLINE

SURROGATE PERCENT RECOVERY

TRIFLUOROTOLUENE	78
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ATI I.D. # 9209-142-2

TOTAL PETROLEUM HYDROCARBON ANALYSIS
DATA SUMMARY

CLIENT : GEOENGINEERS, INC.
PROJECT # : 0372-080-R04
PROJECT NAME : CHEVRON - BELLINGHAM
CLIENT I.D. : 920915-TP2
SAMPLE MATRIX : SOIL
METHOD : WA DOE WTPH-G
RESULTS ARE CORRECTED FOR MOISTURE CONTENT

DATE SAMPLED : 09/15/92
DATE RECEIVED : 09/16/92
DATE EXTRACTED : 09/23/92
DATE ANALYZED : 09/24/93
UNITS : mg/Kg
DILUTION FACTOR : 1

COMPOUND

MDL

RESULT

FUEL HYDROCARBONS
HYDROCARBON RANGE
HYDROCARBON QUANTITATION USING

6

ND
TOLUENE TO DODECANE
GASOLINE

SURROGATE PERCENT RECOVERY

TRIFLUOROTOLUENE

76

ATI I.D. # 9209-142-3

TOTAL PETROLEUM HYDROCARBON ANALYSIS
DATA SUMMARY

CLIENT	: GEOENGINEERS, INC.	DATE SAMPLED	: 09/15/92
PROJECT #	: 0372-080-R04	DATE RECEIVED	: 09/16/92
PROJECT NAME	: CHEVRON - BELLINGHAM	DATE EXTRACTED	: 09/23/92
CLIENT I.D.	: 920915-TP3	DATE ANALYZED	: 09/24/93
SAMPLE MATRIX	: SOIL	UNITS	: mg/Kg
METHOD	: WA DOE WTPH-G	DILUTION FACTOR	: 1
RESULTS ARE CORRECTED FOR MOISTURE CONTENT			

COMPOUND	MDL	RESULT
FUEL HYDROCARBONS	6	ND
HYDROCARBON RANGE		TOLUENE TO DODECANE
HYDROCARBON QUANTITATION USING		GASOLINE

SURROGATE PERCENT RECOVERY

TRIFLUOROTOLUENE	87
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ATI I.D. # 9209-142-4

TOTAL PETROLEUM HYDROCARBON ANALYSIS
DATA SUMMARY

CLIENT	: GEOENGINEERS, INC.	DATE SAMPLED	: 09/15/92
PROJECT #	: 0372-080-R04	DATE RECEIVED	: 09/16/92
PROJECT NAME	: CHEVRON - BELLINGHAM	DATE EXTRACTED	: 09/23/92
CLIENT I.D.	: 920915-TP3-2	DATE ANALYZED	: 09/24/93
SAMPLE MATRIX	: SOIL	UNITS	: mg/Kg
METHOD	: WA DOE WTPH-G	DILUTION FACTOR	: 1

RESULTS ARE CORRECTED FOR MOISTURE CONTENT

COMPOUND	MDL	RESULT
FUEL HYDROCARBONS	6	190
HYDROCARBON RANGE		TOLUENE TO DODECANE
HYDROCARBON QUANTITATION USING		GASOLINE

SURROGATE PERCENT RECOVERY

TRIFLUOROTOLUENE	88
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ATI I.D. # 9209-142-5

TOTAL PETROLEUM HYDROCARBON ANALYSIS
DATA SUMMARY

CLIENT	: GEOENGINEERS, INC.	DATE SAMPLED	: 09/15/92
PROJECT #	: 0372-080-R04	DATE RECEIVED	: 09/16/92
PROJECT NAME	: CHEVRON - BELLINGHAM	DATE EXTRACTED	: 09/23/92
CLIENT I.D.	: 920915-TP3-3	DATE ANALYZED	: 09/24/93
SAMPLE MATRIX	: SOIL	UNITS	: mg/Kg
METHOD	: WA DOE WTPH-G	DILUTION FACTOR	: 1

RESULTS ARE CORRECTED FOR MOISTURE CONTENT

COMPOUND	MDL	RESULT
FUEL HYDROCARBONS	6	ND
HYDROCARBON RANGE		TOLUENE TO DODECANE
HYDROCARBON QUANTITATION USING		GASOLINE

SURROGATE PERCENT RECOVERY

TRIFLUOROTOLUENE	83
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ATI I.D. # 9209-142

TOTAL PETROLEUM HYDROCARBON ANALYSIS
QUALITY CONTROL DATA

CLIENT : GEOENGINEERS, INC.	SAMPLE I.D. # : 9209-142-5
PROJECT # : 0372-080-R04	DATE EXTRACTED : 09/23/92
PROJECT NAME : CHEVRON - BELLINGHAM	DATE ANALYZED : 09/24/92
METHOD : WA DOE WTPH-G	UNITS : mg/Kg
SAMPLE MATRIX : SOIL	

COMPOUND	SAMPLE RESULT	SAMPLE DUP. RESULT	RPD	SPIKE ADDED	SPIKED RESULT	% REC.	DUP. SPIKED RESULT	DUP. % REC.	RPD
PETROLEUM HYDROCARBONS (GASOLINE)	ND	ND	NC	100	94.4	94	92.3	92	2

NC = Not Calculable.

$$\% \text{ Recovery} = \frac{(\text{Spiked Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative \% Difference)} = \frac{|(\text{Spike Result} - \text{Dup. Spike Result})|}{\text{Average Result}} \times 100$$



ATI I.D. # 9209-142

TOTAL PETROLEUM HYDROCARBON ANALYSIS
QUALITY CONTROL DATA

CLIENT	: GEOENGINEERS, INC.	SAMPLE I.D. #	: BLANK SPIKE
PROJECT #	: 0372-080-R04	DATE EXTRACTED	: 09/23/92
PROJECT NAME	: CHEVRON - BELLINGHAM	DATE ANALYZED	: 09/24/92
METHOD	: WA DOE WTPH-G	UNITS	: mg/Kg
SAMPLE MATRIX	: SOIL		

COMPOUND	SAMPLE RESULT	SPIKE ADDED	SPIKED RESULT	% REC.	DUP. SPIKED RESULT	DUP. % REC.	RPD
PETROLEUM HYDROCARBONS (GASOLINE)	ND	100	105	105	105	105	0

$$\% \text{ Recovery} = \frac{(\text{Spiked Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative \% Difference)} = \frac{|(\text{Spike Result} - \text{Dup. Spike Result})|}{\text{Average Result}} \times 100$$

ATI I.D. # 9209-142

GENERAL CHEMISTRY ANALYSIS

CLIENT : GEOENGINEERS, INC.
PROJECT # : 0372-080-R04
PROJECT NAME : CHEVRON - BELLINGHAM

MATRIX : SOIL

PARAMETERDATE ANALYZED

MOISTURE

09/23/92



ATI I.D. # 9209-142

GENERAL CHEMISTRY ANALYSIS
DATA SUMMARY

CLIENT : GEOENGINEERS, INC.
PROJECT # : 0372-080-R04
PROJECT NAME : CHEVRON - BELLINGHAM

MATRIX : SOIL

UNITS : %

ATI I.D. #	CLIENT I.D.	MDL	MOISTURE RESULT
9209-142-1	920915-TP1	0.5	12
9209-142-2	920915-TP2	0.5	10
9209-142-3	920915-TP3	0.5	18
9209-142-4	920915-TP3-2	0.5	22
9209-142-5	920915-TP3-3	0.5	11

ATI I.D. # 9209-142

GENERAL CHEMISTRY ANALYSIS
QUALITY CONTROL DATA

CLIENT : GEOENGINEERS, INC.
PROJECT # : 0372-080-R04
PROJECT NAME : CHEVRON - BELLINGHAM

MATRIX : SOIL

UNITS : %

PARAMETER	ATI I.D.	SAMPLE RESULT	DUP RESULT	RPD	SPIKED RESULT	SPIKE ADDED	% REC
MOISTURE	9209-211-2	19	18	5	N/A	N/A	N/A
MOISTURE	9209-234-4	16	16	0	N/A	N/A	N/A

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative \% Difference)} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 100$$

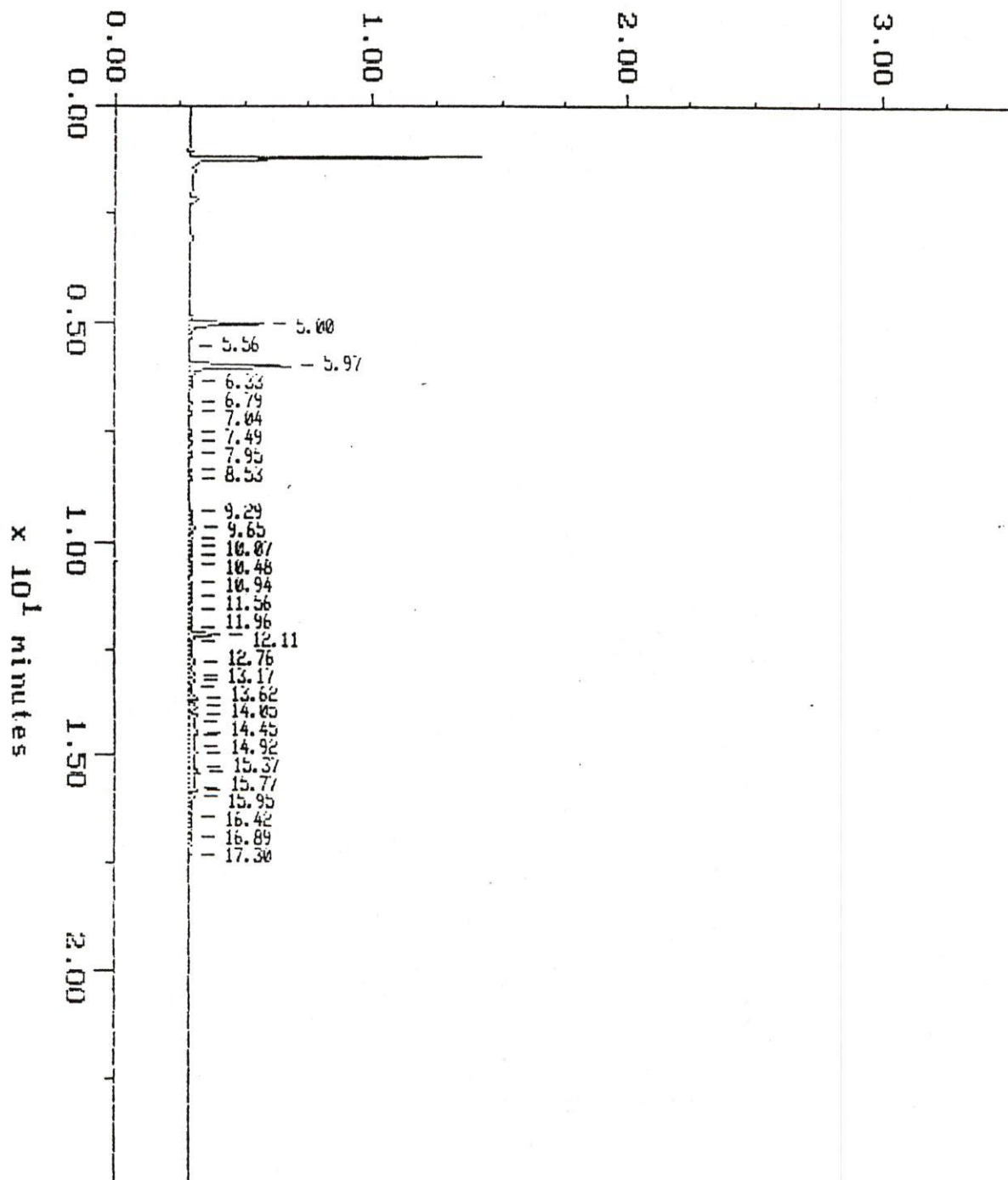
WTPHG

Sample: 9209-142-1
Acquired: 24-SEP-92 2:49

Channel: FID
Method: H:\BRU2\MAXDATA\BALZAC\0923BZ92

Filename: 0923BZ32
Operator: BOB

$\times 10^{-1}$ volts



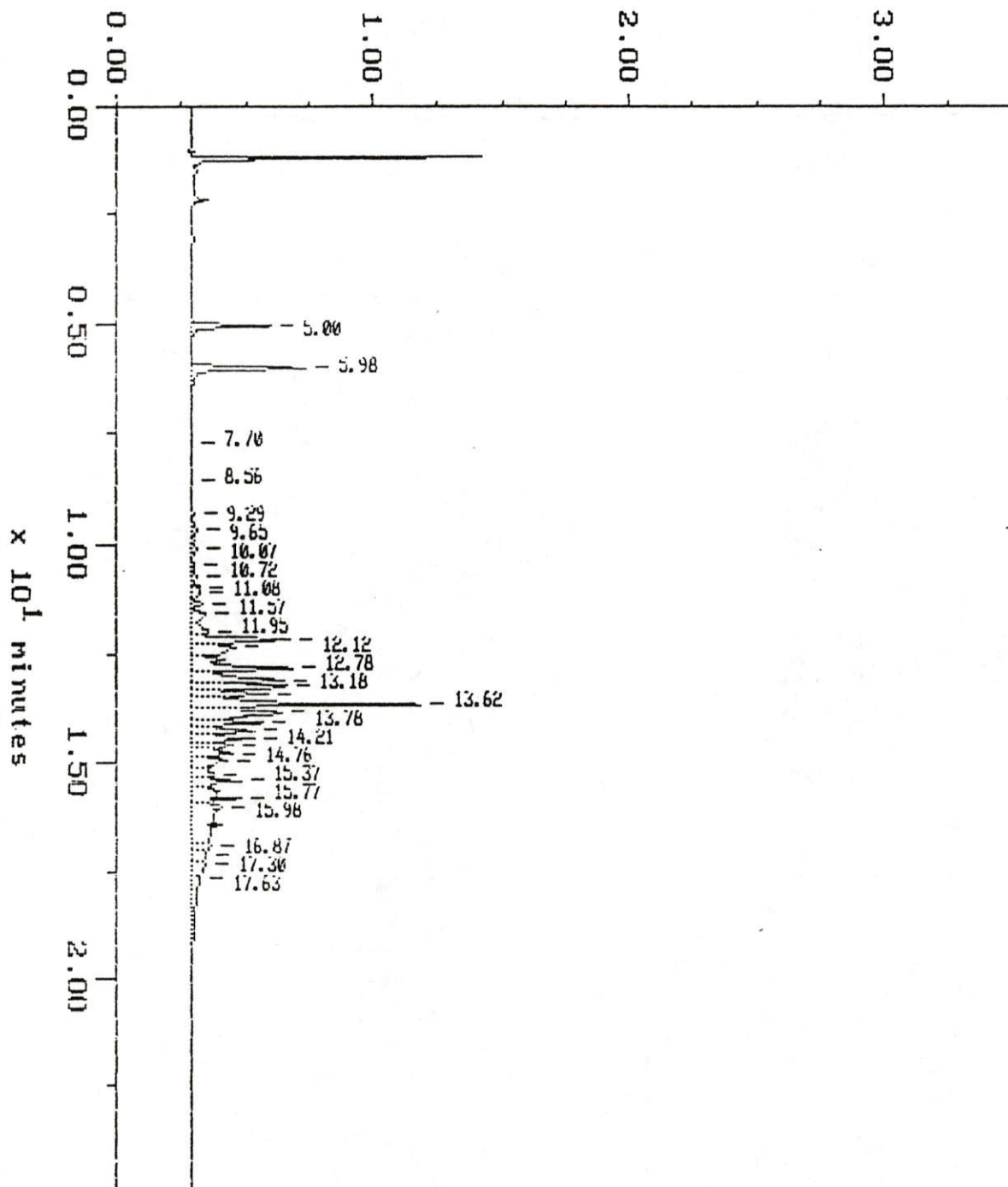
WTPH 6

Sample: 9209-142-4
Acquired: 24-SEP-92 4:12

Channel: FID
Method: H:\BRU2\MAXDATA\BALZAC\09238Z92

Filename: 09238Z35
Operator: BOB

$\times 10^{-1}$ volts

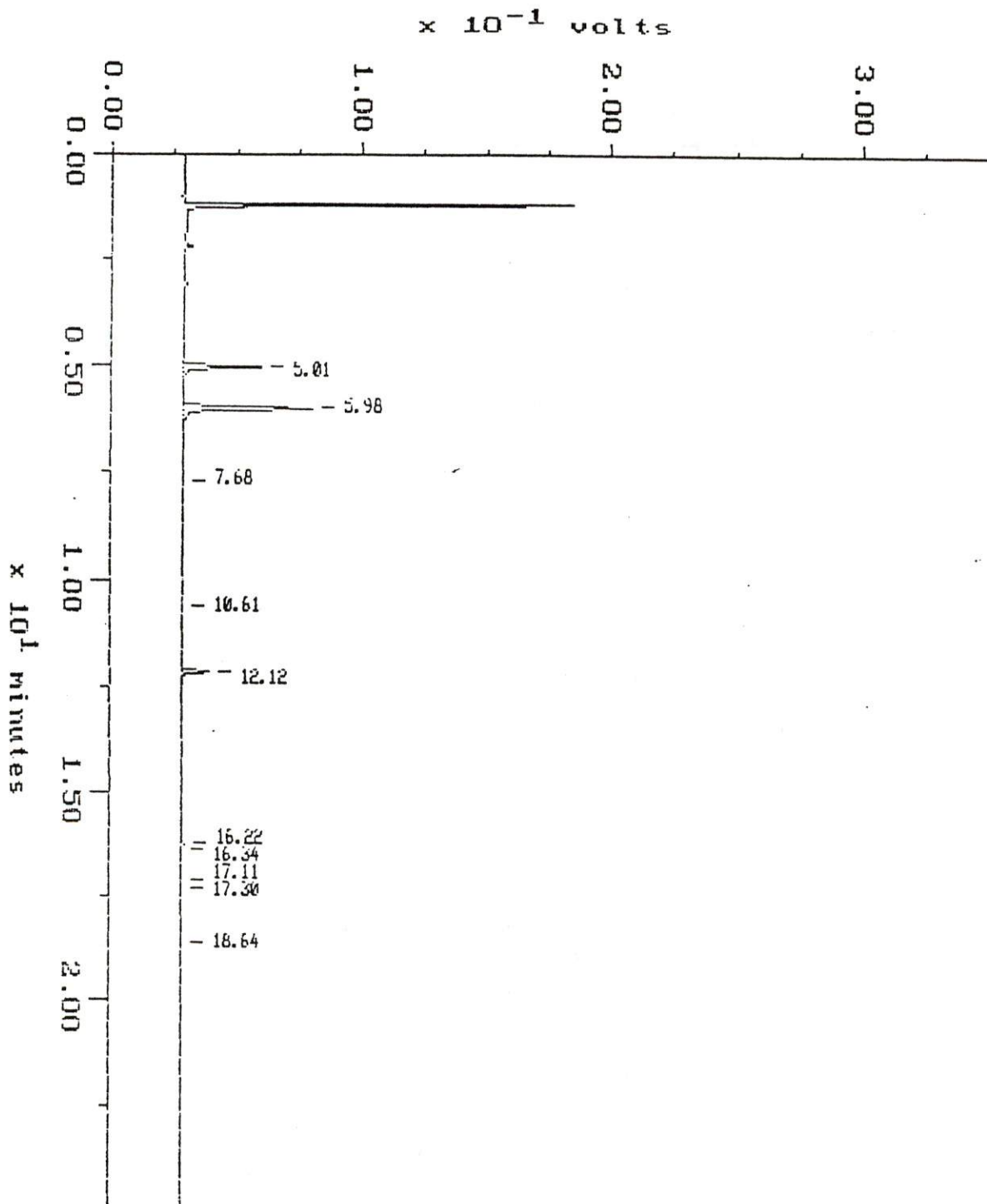


W+PHG Method Blank

Sample: SR8 9/23
Acquired: 23-SEP-92 19:23

Channel: FID
Method: H:\BRU2\MAXDATA\BALZAC\09238792

Filename: 09238716
Operator: BOB



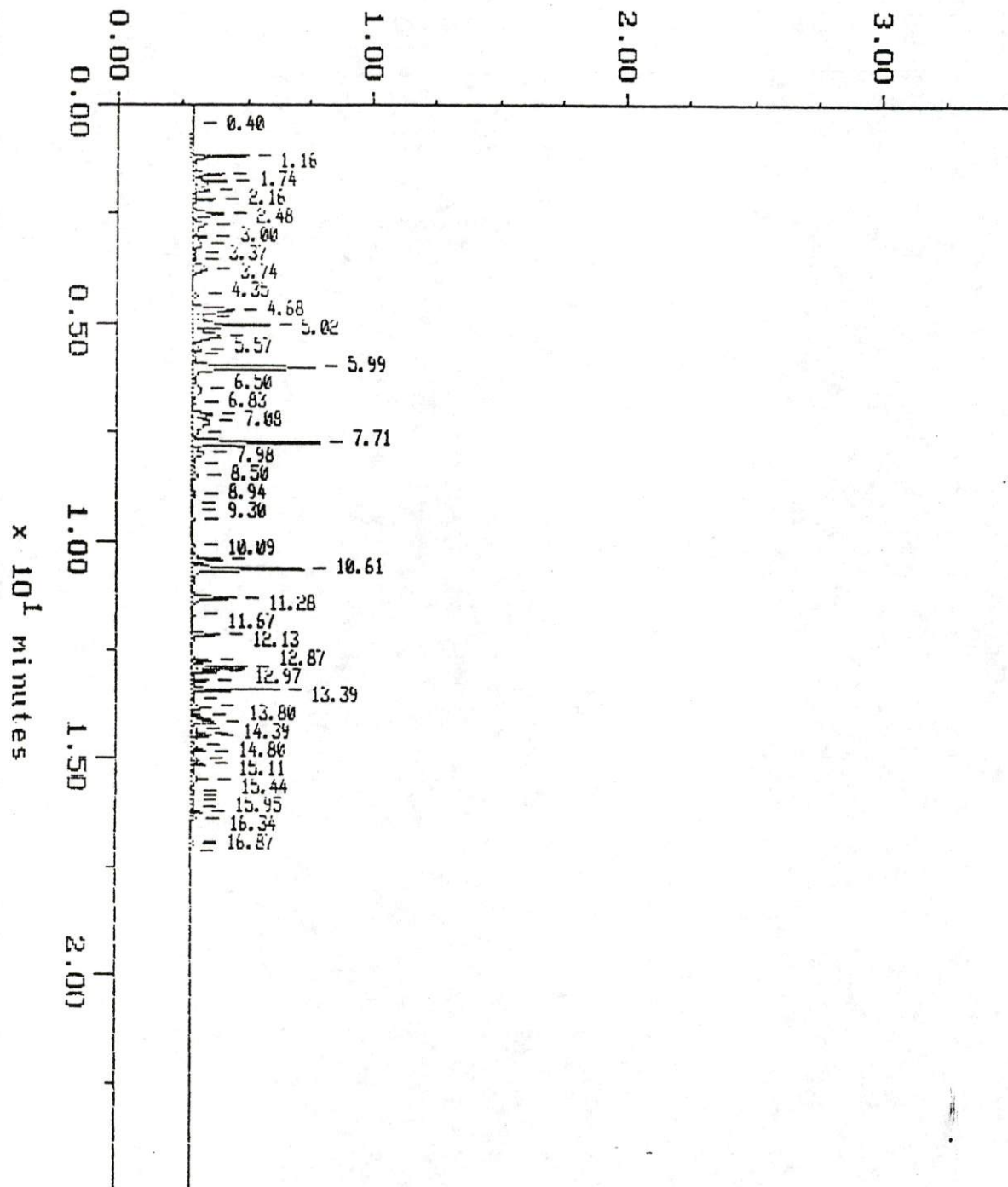
WTPHG C.C.

Sample: STD-C 9/23
Acquired: 23-SEP-92 12:02

Channel: FID
Method: H:\BRO2\MAXDATA\BALZAC\0923BZ92

Filename: 0923BZ03
Operator: BUB

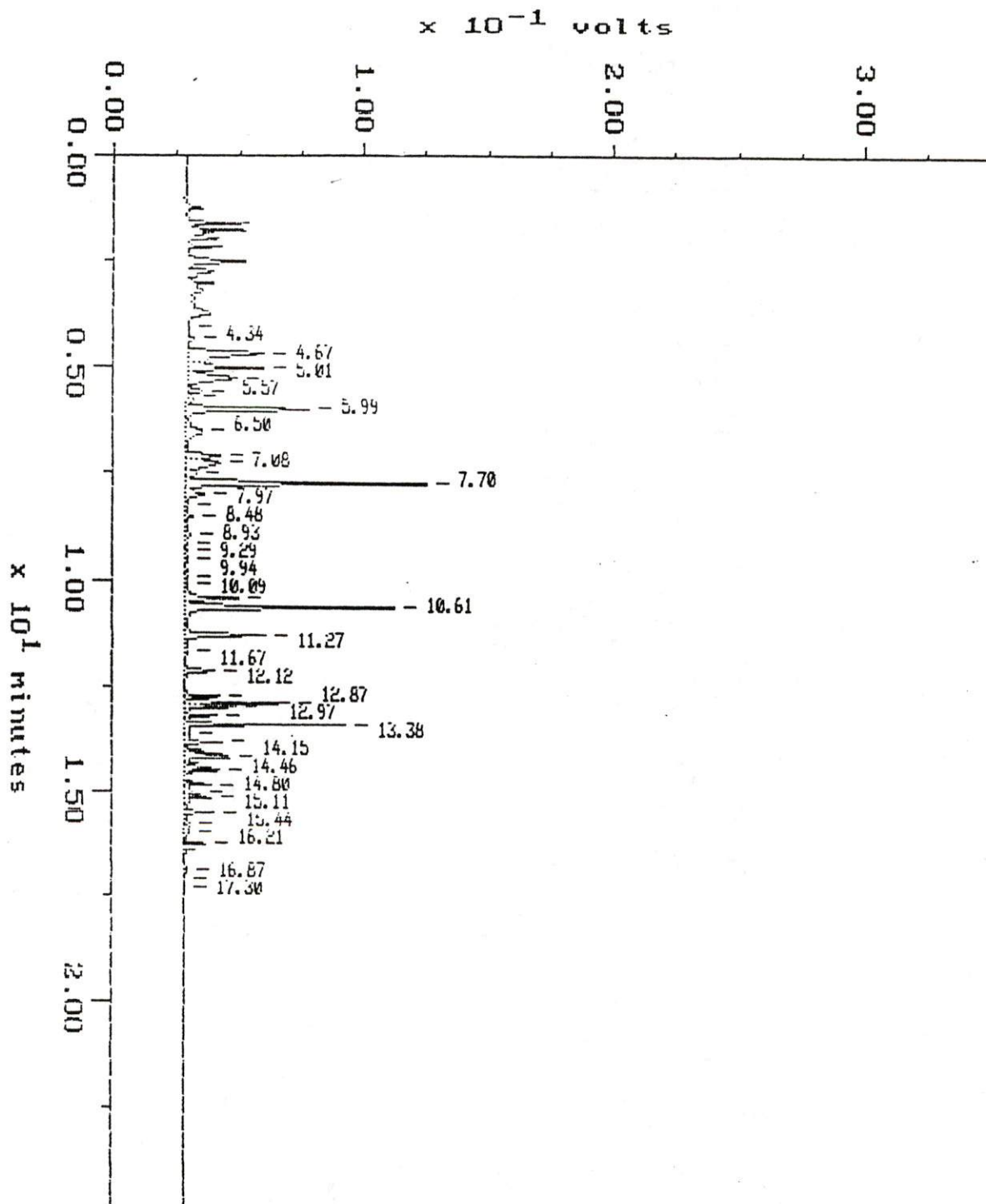
$\times 10^{-1}$ volts



w t p l t 6 c.c.

Sample: CC 2 PPM Channel: FID
Acquired: 24-SEP-92 8:56 Method: H:\BR02\MAXDATA\BALZAC\0923BZ92

Filename: 0923BZ37
Operator: BOB

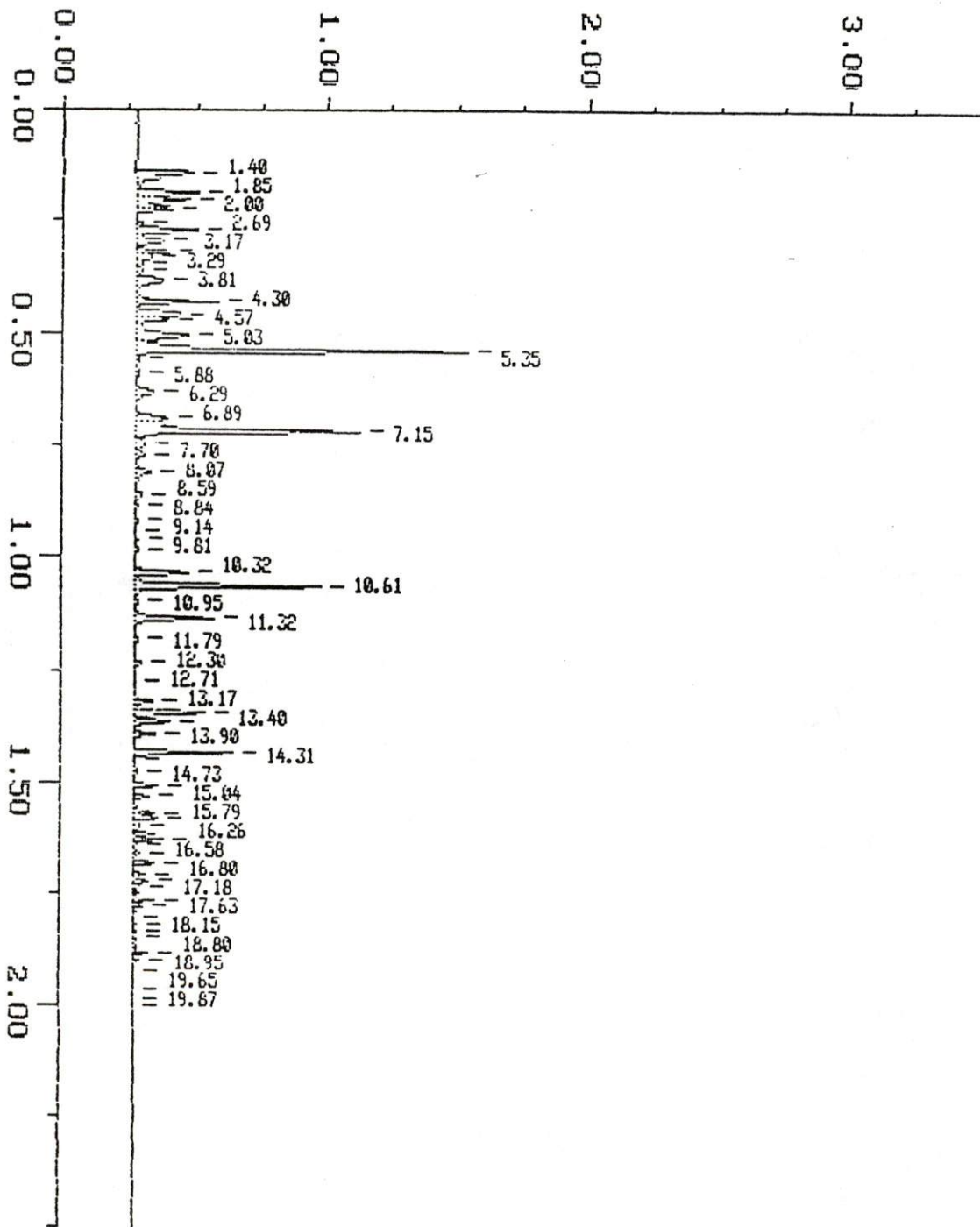


WTPHG C.C.

Sample: STD-C Channel: PRISCILLA
Acquired: 23-SEP-92 12:22 Method: H:\BRO2\MAXDATA\ELVIS-PA\092392EP
Comments: ATI FUELS: A MISSION OF EXCELLENCE IN ANALYTICAL CHROMATOGRAPHY.

Filename: 0923EP02
Operator: ATI

$\times 10^{-1}$ volts

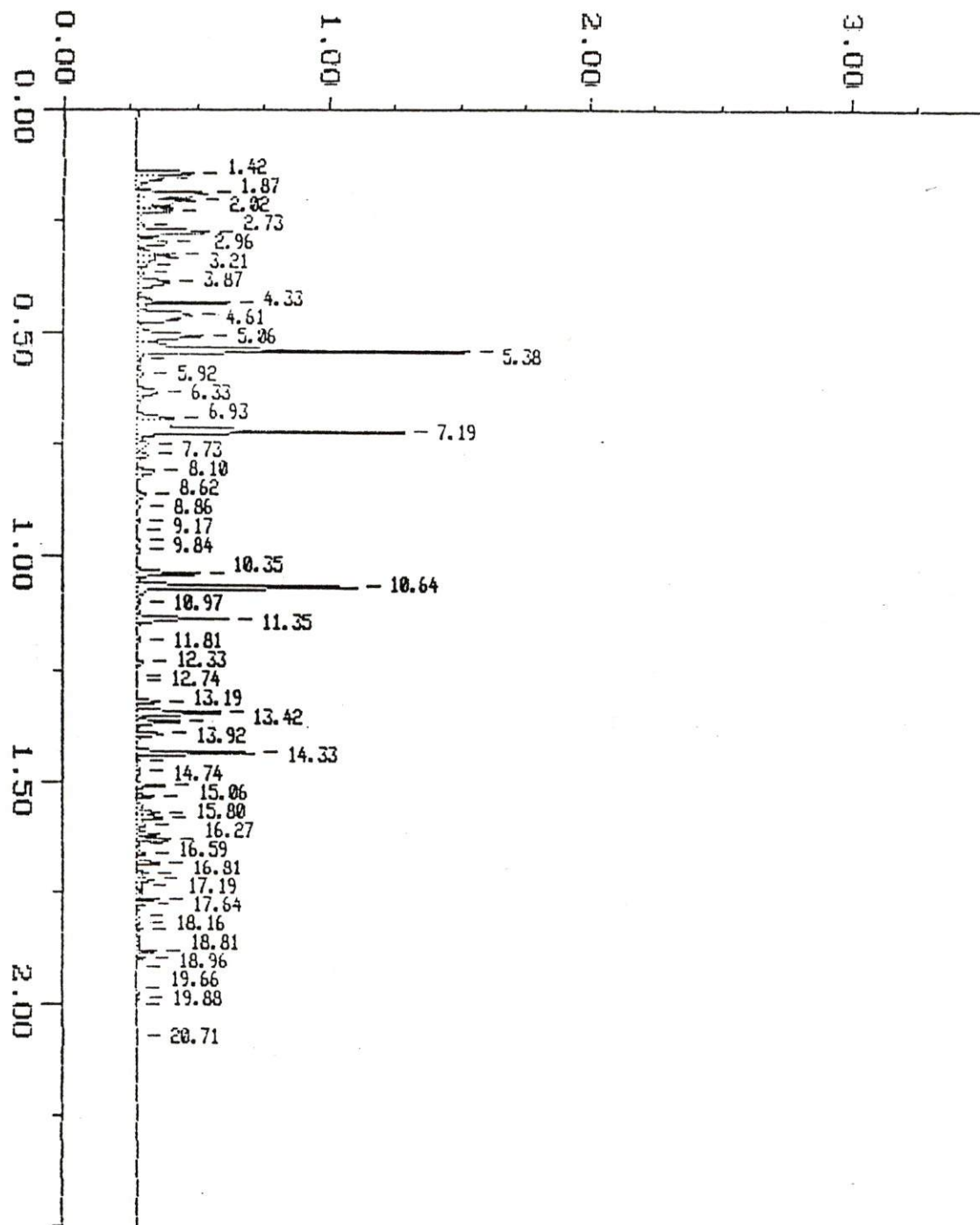


WTPHG C.C.

Sample: STD-C 9/23 Channel: PRISCILLA
Acquired: 24-SEP-92 8:35 Method: H:\BRO2\MAXDATA\ELVIS-P\092392EP
Comments: ATI FUELS: A MISSION OF EXCELLENCE IN ANALYTICAL CHROMATOGRAPHY.

Filename: 0923EP16
Operator: ATI

$\times 10^{-1}$ volts



Chain of Custody

LABORATORY NUMBER: 9209-142

DATE 9/15/92 PAGE 1 OF 1

PROJECT MANAGER: <u>Kurt Frasse</u>					ANALYSIS REQUEST																											
COMPANY: <u>GEO Engineers, Inc.</u>					8010	8020	8020	8240	8270	8310	8080	8080	8140	8150	WDOE	418.1	413.2	8015	TOC	TOX	%	EP	Priority	8080	8240	8270	8150	Metals	WTPH-6	BETX	NUMBER	
ADDRESS: <u>2410 154th Ave SE</u>					Halogenated	Aromatic	BETX ONLY	GCMS Volatiles	GCMS BNA	HPLC PNA	Pesticides & PCB's	PCB's ONLY	Phosphate Pesticides	Herbicides	PAH/HH (WAC 173)	(TPH)	Grease & Oil	(Modified)	9060	9020	Moisture	TOX Metals (8) EP EXT	Pollutant Metals (13)	Pesticide (4)	ZH-EXT	Herbicides (2)	(8)					
PHONE: <u>861 6000</u> SAMPLED BY: <u>DAVE KING</u>																																
SAMPLE DISPOSAL INSTRUCTIONS																																
☒ ATI Disposal @ \$5.00 each ☐ Return																																
SAMPLE ID	DATE	TIME	MATRIX	LAB ID																												
920915-TPI	9/15/92	1115	S	1																												
920915-TP2		1250		2																												
920915-TP3		1540		3																												
920915-TP3-2		1610		4																												
920915-TP3-3		1615		5																												

PROJECT INFORMATION		SAMPLE RECEIPT		RELINQUISHED BY: 1.		RELINQUISHED BY: 2.		RELINQUISHED BY: 3.	
PROJECT NUMBER: <u>372-080-14</u>		TOTAL NUMBER OF CONTAINERS <u>5</u>		Signature: <u>DAVID KING</u> Time: <u>1838</u>		Signature: _____ Time: _____		Signature: _____ Time: _____	
PROJECT NAME: <u>Cherian Bellingham</u>		COC SEALS/INTACT? Y/N/NA <u>Y/N</u>		Printed Name: _____ Date: _____		Printed Name: _____ Date: _____		Printed Name: _____ Date: _____	
PURCHASE ORDER NUMBER: _____		RECEIVED GOOD COND/COLD <u>Y/N</u>		DAVID KING 9/15/92		Company: <u>GEO Engineers</u>		Company: _____	
ONGOING PROJECT? YES ☒ NO ☐		RECEIVED VIA: <u>Courier</u>		Company: <u>GEO Engineers</u>		Company: _____		Company: _____	
PRIOR AUTHORIZATION IS REQUIRED FOR RUSH PROJECTS									
TAT: (NORMAL) ☐ 2WKS ☒ (RUSH) ☒ 24HR ☐ 48 HRS ☐ 72 HRS ☐ 1 WK				RECEIVED BY: 1. Signature: <u>Karin R. West</u> Time: <u>1322</u>		RECEIVED BY: 2. Signature: _____ Time: _____		RECEIVED BY: (LAB) 3. Signature: _____ Time: _____	
GREATER THAN 24 HR. NOTICE? YES ☐ NO ☐ (LAB USE ONLY)				Printed Name: <u>Karin R. West</u> Date: <u>9/15/92</u>		Printed Name: _____ Date: _____		Printed Name: _____ Date: _____	
SPECIAL INSTRUCTIONS: <u>No more than 1 week turn around time for WTPH-6.</u>				Company: <u>ATI-WA</u>		Company: _____		Analytical Technologies, Inc.	



Analytical **Technologies, Inc.**

560 Naches Avenue, S.W., Suite 101, Renton, WA 98055 (206) 228-8335

ATI I.D. # 9209-154

September 28, 1992

GeoEngineers

GeoEngineers, Inc.
8410 154th Ave. N.E.
Redmond, WA 98052

SEP 29 1992

Routing

File

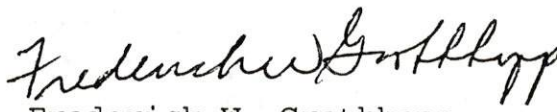
Attention : Kurt Fraese

Project Number : 0372-080-R04

Project Name : Chevron - Bellingham

On September 17, 1992, Analytical Technologies, Inc., received eight soil samples for analysis. The samples were analyzed with EPA methodology or equivalent methods as specified in the attached analytical schedule. The results, sample cross reference, and quality control data are enclosed.


Donna M. McKinney
Senior Project Manager


Frederick W. Grothkopp
Laboratory Manager

FWG/hal/elf

ATI I.D. # 9209-154

SAMPLE CROSS REFERENCE SHEET

CLIENT : GEOENGINEERS, INC.
PROJECT # : 0372-080-R04
PROJECT NAME : CHEVRON - BELLINGHAM

ATI #	CLIENT DESCRIPTION	DATE SAMPLED	MATRIX
9209-154-1	920916-TP-4	09/16/92	SOIL
9209-154-2	920916-TP-5	09/16/92	SOIL
9209-154-3	920916-TP6	09/16/92	SOIL
9209-154-4	920916-TP6-2	09/16/92	SOIL
9209-154-5	920916-TP6-3	09/16/92	SOIL
9209-154-6	920916-TP7	09/16/92	SOIL
9209-154-7	920916-TP8	09/16/92	SOIL
9209-154-8	920916-TP8-2	09/16/92	SOIL

----- TOTALS -----

MATRIX	# SAMPLES
SOIL	8

ATI STANDARD DISPOSAL PRACTICE

The samples from this project will be disposed of in thirty (30) days from the date of the report. If an extended storage period is required, please contact our sample control department before the scheduled disposal date.

ATI I.D. # 9209-154

ANALYTICAL SCHEDULE

CLIENT : GEOENGINEERS, INC.
PROJECT # : 0372-080-R04
PROJECT NAME : CHEVRON - BELLINGHAM

ANALYSIS	TECHNIQUE	REFERENCE	LAB
BETX	GC/PID	EPA 8020	PTL
TOTAL PETROLEUM HYDROCARBONS	GC/FID	WA DOE WTPH-G	PTL
TOTAL PETROLEUM HYDROCARBONS	GC/FID	WA DOE WTPH-D	PTL
PETROLEUM HYDROCARBONS	IR	WA DOE WTPH-418.1 MODIFIED	PTL
MOISTURE	GRAVIMETRIC	CLP SOW ILMO1.0	R

R = ATI - Renton
SD = ATI - San Diego
PHX = ATI - Phoenix
PTL = ATI - Portland
PNR = ATI - Pensacola
FC = ATI - Fort Collins
SUB = Subcontract

ATI I.D. # 9209-154

QUALITY CONTROL INFORMATION

CLIENT : GEOENGINEERS, INC.
PROJECT # : 0372-080-R04
PROJECT NAME : CHEVRON - BELLINGHAM

BETX

DETECTION LIMITS

	WATER	SOIL
Benzene	0.0005 mg/L	0.025 mg/Kg
Toluene	0.0005 mg/L	0.025 mg/Kg
Ethyl Benzene	0.0005 mg/L	0.025 mg/Kg
Xylenes	0.0005 mg/L	0.025 mg/Kg

CONTROL LIMITS

BLANK SPIKE	WATER	RPD	SOIL	RPD
Benzene	80-120	20	60-110	20
Toluene	80-120	20	70-120	20
Ethylbenzene	80-120	20	70-120	20
Xylenes	80-120	20	70-120	20
MATRIX SPIKE	WATER	RPD	SOIL	RPD
Benzene	75-118	20	55-110	20
Toluene	71-122	20	80-112	20
Ethylbenzene	70-120	20	55-110	20
Xylenes	70-117	20	60-110	20

WA DOE WTPH-G

DETECTION LIMITS

	SOIL
Gasoline	5 mg/Kg

CONTROL LIMITS

BLANK SPIKE	SOIL	RPD
Gasoline	80-120	20
MATRIX SPIKE	SOIL	RPD
Gasoline	60-120	20

CONTINUED ON NEXT PAGE



ATI I.D. # 9209-154

QUALITY CONTROL
INFORMATION
CONTINUED

CLIENT : GEOENGINEERS, INC.
PROJECT # : 0372-080-R04
PROJECT NAME : CHEVRON - BELLINGHAM

WA DOE WTPH-D

DETECTION LIMITS

Diesel

SOIL
25 mg/Kg

CONTROL LIMITS

BLANK SPIKE
DieselSOIL RPD
70-130 20MATRIX SPIKE
DieselSOIL RPD
70-130 20

EPA 418.1 and WTPH 418.1 Modified

DETECTION LIMITS

COMPOUND
Petroleum HydrocarbonWATER
1 mg/LSOIL
5 mg/Kg

CONTROL LIMITS

BLANK SPIKE
Petroleum HydrocarbonsWATER RPD
70-120 20SOIL RPD
70-130 20MATRIX SPIKE
Fuel HydrocarbonsWATER RPD
60-120 20SOIL RPD
60-140 20

ATTI I.D. # 9209-154

VOLATILE ORGANIC COMPOUNDS
DATA SUMMARY

CLIENT : GEOENGINEERS, INC.
PROJECT # : 0372-080-R04
PROJECT NAME : CHEVRON - BELLINGHAM
CLIENT I.D. : REAGENT BLANK
SAMPLE MATRIX : SOIL
EPA METHOD : 8020 (BETX)
RESULTS ARE CORRECTED FOR MOISTURE CONTENT

DATE SAMPLED : N/A
DATE RECEIVED : N/A
DATE EXTRACTED : 09/21/92
DATE ANALYZED : 09/21/92
UNITS : mg/Kg
DILUTION FACTOR : 1

COMPOUND	MDL	RESULT
BENZENE	0.025	ND
ETHYLBENZENE	0.025	ND
TOLUENE	0.025	ND
TOTAL XYLENES	0.025	ND

SURROGATE PERCENT RECOVERY

TRIFLUOROTOLUENE 113

ATI I.D. # 9209-154-1

VOLATILE ORGANIC COMPOUNDS
DATA SUMMARY

CLIENT	: GEOENGINEERS, INC.	DATE SAMPLED	: 09/16/92
PROJECT #	: 0372-080-R04	DATE RECEIVED	: 09/17/92
PROJECT NAME	: CHEVRON - BELLINGHAM	DATE EXTRACTED	: 09/21/92
CLIENT I.D.	: 920916-TP-4	DATE ANALYZED	: 09/21/92
SAMPLE MATRIX	: SOIL	UNITS	: mg/Kg
EPA METHOD	: 8020 (BETX)	DILUTION FACTOR	: 1

RESULTS ARE CORRECTED FOR MOISTURE CONTENT

COMPOUND	MDL	RESULT
BENZENE	0.028	ND
ETHYLBENZENE	0.028	0.15
TOLUENE	0.028	ND
TOTAL XYLENES	0.028	0.26

SURROGATE PERCENT RECOVERY

TRIFLUOROTOLUENE	100
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ATI I.D. # 9209-154-2

VOLATILE ORGANIC COMPOUNDS
DATA SUMMARY

CLIENT	: GEOENGINEERS, INC.	DATE SAMPLED	: 09/16/92
PROJECT #	: 0372-080-R04	DATE RECEIVED	: 09/17/92
PROJECT NAME	: CHEVRON - BELLINGHAM	DATE EXTRACTED	: 09/21/92
CLIENT I.D.	: 920916-TP-5	DATE ANALYZED	: 09/21/92
SAMPLE MATRIX	: SOIL	UNITS	: mg/Kg
EPA METHOD	: 8020 (BETX)	DILUTION FACTOR	: 1

RESULTS ARE CORRECTED FOR MOISTURE CONTENT

COMPOUND	MDL	RESULT
BENZENE	0.028	ND
ETHYLBENZENE	0.028	ND
TOLUENE	0.028	ND
TOTAL XYLENES	0.028	ND

SURROGATE PERCENT RECOVERY

TRIFLUOROTOLUENE	99
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ATI I.D. # 9209-154-3

VOLATILE ORGANIC COMPOUNDS
DATA SUMMARY

CLIENT : GEOENGINEERS, INC.
PROJECT # : 0372-080-R04
PROJECT NAME : CHEVRON - BELLINGHAM
CLIENT I.D. : 920916-TP6
SAMPLE MATRIX : SOIL
EPA METHOD : 8020 (BETX)
RESULTS ARE CORRECTED FOR MOISTURE CONTENT

DATE SAMPLED : 09/16/92
DATE RECEIVED : 09/17/92
DATE EXTRACTED : 09/21/92
DATE ANALYZED : 09/21/92
UNITS : mg/Kg
DILUTION FACTOR : 1

COMPOUND	MDL	RESULT
BENZENE	0.028	ND
ETHYLBENZENE	0.028	0.033
TOLUENE	0.028	0.038
TOTAL XYLENES	0.028	0.064

SURROGATE PERCENT RECOVERY

TRIFLUOROTOLUENE	99
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ATI I.D. # 9209-154-4

VOLATILE ORGANIC COMPOUNDS
DATA SUMMARY

CLIENT : GEOENGINEERS, INC.
PROJECT # : 0372-080-R04
PROJECT NAME : CHEVRON - BELLINGHAM
CLIENT I.D. : 920916-TP6-2
SAMPLE MATRIX : SOIL
EPA METHOD : 8020 (BETX)
RESULTS ARE CORRECTED FOR MOISTURE CONTENT

DATE SAMPLED : 09/16/92
DATE RECEIVED : 09/17/92
DATE EXTRACTED : 09/21/92
DATE ANALYZED : 09/21/92
UNITS : mg/Kg
DILUTION FACTOR : 1

COMPOUND	MDL	RESULT
BENZENE	0.030	ND
ETHYLBENZENE	0.030	0.18
TOLUENE	0.030	ND
TOTAL XYLENES	0.030	0.78

SURROGATE PERCENT RECOVERY

RIFLUOROTOLUENE 98

ATI I.D. # 9209-154-5

VOLATILE ORGANIC COMPOUNDS
DATA SUMMARY

CLIENT : GEOENGINEERS, INC.
PROJECT # : 0372-080-R04
PROJECT NAME : CHEVRON - BELLINGHAM
CLIENT I.D. : 920916-TP6-3
SAMPLE MATRIX : SOIL
EPA METHOD : 8020 (BETX)
RESULTS ARE CORRECTED FOR MOISTURE CONTENT

DATE SAMPLED : 09/16/92
DATE RECEIVED : 09/17/92
DATE EXTRACTED : 09/21/92
DATE ANALYZED : 09/21/92
UNITS : mg/Kg
DILUTION FACTOR : 1

COMPOUND	MDL	RESULT
BENZENE	0.034	ND
ETHYLBENZENE	0.034	ND
TOLUENE	0.034	ND
TOTAL XYLENES	0.034	ND

SURROGATE PERCENT RECOVERY

TRIFLUOROTOLUENE	95
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ATI I.D. # 9209-154-6

VOLATILE ORGANIC COMPOUNDS
DATA SUMMARY

CLIENT : GEOENGINEERS, INC.
PROJECT # : 0372-080-R04
PROJECT NAME : CHEVRON - BELLINGHAM
CLIENT I.D. : 920916-TP7
SAMPLE MATRIX : SOIL
EPA METHOD : 8020 (BETX)
RESULTS ARE CORRECTED FOR MOISTURE CONTENT

DATE SAMPLED : 09/16/92
DATE RECEIVED : 09/17/92
DATE EXTRACTED : 09/21/92
DATE ANALYZED : 09/21/92
UNITS : mg/Kg
DILUTION FACTOR : 1

COMPOUND	MDL	RESULT
BENZENE	0.027	ND
ETHYLBENZENE	0.027	ND
TOLUENE	0.027	ND
TOTAL XYLENES	0.027	ND

SURROGATE PERCENT RECOVERY

TRIFLUOROTOLUENE 99

ATI I.D. # 9209-154-7

VOLATILE ORGANIC COMPOUNDS
DATA SUMMARY

CLIENT : GEOENGINEERS, INC.
PROJECT # : 0372-080-R04
PROJECT NAME : CHEVRON - BELLINGHAM
CLIENT I.D. : 920916-TP8
SAMPLE MATRIX : SOIL
EPA METHOD : 8020 (BETX)
RESULTS ARE CORRECTED FOR MOISTURE CONTENT

DATE SAMPLED : 09/16/92
DATE RECEIVED : 09/17/92
DATE EXTRACTED : 09/21/92
DATE ANALYZED : 09/21/92
UNITS : mg/Kg
DILUTION FACTOR : 1

COMPOUND	MDL	RESULT
BENZENE	0.028	ND
ETHYLBENZENE	0.028	ND
TOLUENE	0.028	ND
TOTAL XYLENES	0.028	ND

SURROGATE PERCENT RECOVERY

TRIFLUOROTOLUENE	99
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ATI I.D. # 9209-154-8

VOLATILE ORGANIC COMPOUNDS
DATA SUMMARY

CLIENT : GEOENGINEERS, INC.
PROJECT # : 0372-080-R04
PROJECT NAME : CHEVRON - BELLINGHAM
CLIENT I.D. : 920916-TP8-2
SAMPLE MATRIX : SOIL
EPA METHOD : 8020 (BETX)

DATE SAMPLED : 09/16/92
DATE RECEIVED : 09/17/92
DATE EXTRACTED : 09/21/92
DATE ANALYZED : 09/21/92
UNITS : mg/Kg
DILUTION FACTOR : 1

RESULTS ARE CORRECTED FOR MOISTURE CONTENT

COMPOUND	MDL	RESULT
BENZENE	0.028	ND
ETHYLBENZENE	0.028	ND
TOLUENE	0.028	ND
TOTAL XYLENES	0.028	ND

SURROGATE PERCENT RECOVERY

TRIFLUOROTOLUENE 99



ATI I.D. # 9209-154

VOLATILE ORGANIC COMPOUNDS
QUALITY CONTROL DATA

CLIENT : GEOENGINEERS, INC. SAMPLE I.D. : 9209-154-2
PROJECT # : 0372-080-R04 DATE EXTRACTED : 09/21/92
PROJECT NAME : CHEVRON - BELLINGHAM DATE ANALYZED : 09/21/92
EPA METHOD : 8020 (BETX) MATRIX : SOIL
RESULTS ARE CORRECTED FOR MOISTURE CONTENT UNITS : mg/Kg

COMPOUND	SAMPLE RESULT	SPIKE ADDED	SPIKED SAMPLE	% REC	DUP SPIKED SAMPLE	DUP % REC	RPD
BENZENE	ND	1.14	0.78	68	0.87	76	11
ETHYLBENZENE	ND	1.14	0.82	72	0.92	81	11
TOLUENE	ND	1.14	0.80	70	0.89	78	11
TOTAL XYLENES	ND	2.27	1.73	76	1.91	84	10

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative \% Difference)} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 100$$



ATI I.D. # 9209-154

VOLATILE ORGANIC COMPOUNDS
QUALITY CONTROL DATA

CLIENT : GEOENGINEERS, INC. SAMPLE I.D. : BLANK SPIKE
PROJECT # : 0372-080-R04 DATE EXTRACTED : 09/21/92
PROJECT NAME : CHEVRON - BELLINGHAM DATE ANALYZED : 09/21/92
EPA METHOD : 8020 (BETX) MATRIX : SOIL
RESULTS ARE CORRECTED FOR MOISTURE CONTENT UNITS : mg/Kg

COMPOUND	SAMPLE RESULT	SPIKE ADDED	SPIKED SAMPLE	% REC	DUP SPIKED SAMPLE	DUP % REC	RPD
BENZENE	ND	1.00	1.00	100	1.06	106	6
ETHYLBENZENE	ND	1.00	1.02	102	1.07	107	5
TOLUENE	ND	1.00	1.00	100	1.05	105	5
TOTAL XYLENES	ND	2.00	2.08	104	2.17	109	4

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative \% Difference)} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 100$$

ATI I.D. # 9209-154

TOTAL PETROLEUM HYDROCARBONS ANALYSIS
DATA SUMMARY

CLIENT : GEOENGINEERS, INC.
PROJECT # : 0372-080-R04
PROJECT NAME : CHEVRON - BELLINGHAM
CLIENT I.D. : REAGENT BLANK
SAMPLE MATRIX : SOIL
METHOD : WA DOE WTPH-G
RESULTS ARE CORRECTED FOR MOISTURE CONTENT

DATE SAMPLED : N/A
DATE RECEIVED : N/A
DATE EXTRACTED : 09/19/92
DATE ANALYZED : 09/20/92
UNITS : mg/Kg
DILUTION FACTOR : 1

COMPOUND	MDL	RESULT
FUEL HYDROCARBONS	5.0	ND
HYDROCARBON RANGE		TOLUENE TO DODECANE
HYDROCARBON QUANTITATION USING		GASOLINE

SURROGATE PERCENT RECOVERY

TRIFLUOROTOLUENE	94
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ATI I.D. # 9209-154-1

TOTAL PETROLEUM HYDROCARBONS ANALYSIS
DATA SUMMARY

CLIENT	: GEOENGINEERS, INC.	DATE SAMPLED	: 09/16/92
PROJECT #	: 0372-080-R04	DATE RECEIVED	: 09/17/92
PROJECT NAME	: CHEVRON - BELLINGHAM	DATE EXTRACTED	: 09/19/92
CLIENT I.D.	: 920916-TP-4	DATE ANALYZED	: 09/20/92
SAMPLE MATRIX	: SOIL	UNITS	: mg/Kg
METHOD	: WA DOE WTPH-G	DILUTION FACTOR	: 1

RESULTS ARE CORRECTED FOR MOISTURE CONTENT

COMPOUND	MDL	RESULT
FUEL HYDROCARBONS	5.7	63
HYDROCARBON RANGE		TOLUENE TO DODECANE
HYDROCARBON QUANTITATION USING		GASOLINE

SURROGATE PERCENT RECOVERY

TRIFLUOROTOLUENE	68
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ATI I.D. # 9209-154-2

TOTAL PETROLEUM HYDROCARBONS ANALYSIS
DATA SUMMARY

CLIENT	: GEOENGINEERS, INC.	DATE SAMPLED	: 09/16/92
PROJECT #	: 0372-080-R04	DATE RECEIVED	: 09/17/92
PROJECT NAME	: CHEVRON - BELLINGHAM	DATE EXTRACTED	: 09/19/92
CLIENT I.D.	: 920916-TP-5	DATE ANALYZED	: 09/20/92
SAMPLE MATRIX	: SOIL	UNITS	: mg/Kg
METHOD	: WA DOE WTPH-G	DILUTION FACTOR	: 1

RESULTS ARE CORRECTED FOR MOISTURE CONTENT

COMPOUND	MDL	RESULT
FUEL HYDROCARBONS	5.7	ND
HYDROCARBON RANGE		TOLUENE TO DODECANE
HYDROCARBON QUANTITATION USING		GASOLINE

SURROGATE PERCENT RECOVERY

TRIFLUOROTOLUENE	66
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ATI I.D. # 9209-154-3

TOTAL PETROLEUM HYDROCARBONS ANALYSIS
DATA SUMMARY

CLIENT	: GEOENGINEERS, INC.	DATE SAMPLED	: 09/16/92
PROJECT #	: 0372-080-R04	DATE RECEIVED	: 09/17/92
PROJECT NAME	: CHEVRON - BELLINGHAM	DATE EXTRACTED	: 09/19/92
CLIENT I.D.	: 920916-TP6	DATE ANALYZED	: 09/20/92
SAMPLE MATRIX	: SOIL	UNITS	: mg/Kg
METHOD	: WA DOE WTPH-G	DILUTION FACTOR	: 1

RESULTS ARE CORRECTED FOR MOISTURE CONTENT

COMPOUND	MDL	RESULT
FUEL HYDROCARBONS	5.6	12
HYDROCARBON RANGE		TOLUENE TO DODECANE
HYDROCARBON QUANTITATION USING		GASOLINE

SURROGATE PERCENT RECOVERY

TRIFLUOROTOLUENE	67
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ATI I.D. # 9209-154-4

TOTAL PETROLEUM HYDROCARBONS ANALYSIS
DATA SUMMARY

CLIENT	: GEOENGINEERS, INC.	DATE SAMPLED	: 09/16/92
PROJECT #	: 0372-080-R04	DATE RECEIVED	: 09/17/92
PROJECT NAME	: CHEVRON - BELLINGHAM	DATE EXTRACTED	: 09/19/92
CLIENT I.D.	: 920916-TP6-2	DATE ANALYZED	: 09/20/92
SAMPLE MATRIX	: SOIL	UNITS	: mg/Kg
METHOD	: WA DOE WTPH-G	DILUTION FACTOR	: 1

RESULTS ARE CORRECTED FOR MOISTURE CONTENT

COMPOUND	MDL	RESULT
FUEL HYDROCARBONS	6.0	130
HYDROCARBON RANGE		TOLUENE TO DODECANE
HYDROCARBON QUANTITATION USING		GASOLINE

SURROGATE PERCENT RECOVERY

TRIFLUOROTOLUENE	67
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ATI I.D. # 9209-154-5

TOTAL PETROLEUM HYDROCARBONS ANALYSIS
DATA SUMMARY

CLIENT : GEOENGINEERS, INC.
PROJECT # : 0372-080-R04
PROJECT NAME : CHEVRON - BELLINGHAM
CLIENT I.D. : 920916-TP6-3
SAMPLE MATRIX : SOIL
METHOD : WA DOE WTPH-G
RESULTS ARE CORRECTED FOR MOISTURE CONTENT

DATE SAMPLED : 09/16/92
DATE RECEIVED : 09/17/92
DATE EXTRACTED : 09/19/92
DATE ANALYZED : 09/20/92
UNITS : mg/Kg
DILUTION FACTOR : 1

COMPOUND

MDL

RESULT

FUEL HYDROCARBONS
HYDROCARBON RANGE
HYDROCARBON QUANTITATION USING

6.8

ND
TOLUENE TO DODECANE
GASOLINE

SURROGATE PERCENT RECOVERY

TRIFLUOROTOLUENE

65

ATI I.D. # 9209-154-6

TOTAL PETROLEUM HYDROCARBONS ANALYSIS
DATA SUMMARY

CLIENT : GEOENGINEERS, INC.
PROJECT # : 0372-080-R04
PROJECT NAME : CHEVRON - BELLINGHAM
CLIENT I.D. : 920916-TP7
SAMPLE MATRIX : SOIL
METHOD : WA DOE WTPH-G
RESULTS ARE CORRECTED FOR MOISTURE CONTENT

DATE SAMPLED : 09/16/92
DATE RECEIVED : 09/17/92
DATE EXTRACTED : 09/19/92
DATE ANALYZED : 09/20/92
UNITS : mg/Kg
DILUTION FACTOR : 1

COMPOUND

MDL

RESULT

FUEL HYDROCARBONS
HYDROCARBON RANGE
HYDROCARBON QUANTITATION USING

5.4

ND
TOLUENE TO DODECANE
GASOLINE

SURROGATE PERCENT RECOVERY

TRIFLUOROTOLUENE

66

ATI I.D. # 9209-154-7

TOTAL PETROLEUM HYDROCARBONS ANALYSIS
DATA SUMMARY

CLIENT : GEOENGINEERS, INC.
PROJECT # : 0372-080-R04
PROJECT NAME : CHEVRON - BELLINGHAM
CLIENT I.D. : 920916-TP8
SAMPLE MATRIX : SOIL
METHOD : WA DOE WTPH-G

DATE SAMPLED : 09/16/92
DATE RECEIVED : 09/17/92
DATE EXTRACTED : 09/19/92
DATE ANALYZED : 09/20/92
UNITS : mg/Kg
DILUTION FACTOR : 1

RESULTS ARE CORRECTED FOR MOISTURE CONTENT

COMPOUND	MDL	RESULT
FUEL HYDROCARBONS	5.6	5.8
HYDROCARBON RANGE		TOLUENE TO DODECANE
HYDROCARBON QUANTITATION USING		GASOLINE

SURROGATE PERCENT RECOVERY

TRIFLUOROTOLUENE	65
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ATI I.D. # 9209-154-8

TOTAL PETROLEUM HYDROCARBONS ANALYSIS
DATA SUMMARY

CLIENT : GEOENGINEERS, INC.
PROJECT # : 0372-080-R04
PROJECT NAME : CHEVRON - BELLINGHAM
CLIENT I.D. : 920916-TP8-2
SAMPLE MATRIX : SOIL
METHOD : WA DOE WTPH-G
RESULTS ARE CORRECTED FOR MOISTURE CONTENT

DATE SAMPLED : 09/16/92
DATE RECEIVED : 09/17/92
DATE EXTRACTED : 09/19/92
DATE ANALYZED : 09/20/92
UNITS : mg/Kg
DILUTION FACTOR : 1

COMPOUND	MDL	RESULT
FUEL HYDROCARBONS	5.6	ND
HYDROCARBON RANGE		TOLUENE TO DODECANE
HYDROCARBON QUANTITATION USING		GASOLINE

SURROGATE PERCENT RECOVERY

TRIFLUOROTOLUENE	71
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ATI I.D. # 9209-154

TOTAL PETROLEUM HYDROCARBONS ANALYSIS
QUALITY CONTROL DATA

CLIENT	: GEOENGINEERS, INC.	SAMPLE I.D. #	: 209554-1
PROJECT #	: 0372-080-R04	DATE EXTRACTED	: 09/19/92
PROJECT NAME	: CHEVRON - BELLINGHAM	DATE ANALYZED	: 09/20/92
METHOD	: WA DOE WTPH-G	UNITS	: mg/Kg
SAMPLE MATRIX	: SOIL		

COMPOUND	SAMPLE RESULT	SAMPLE DUP. RESULT	RPD	SPIKE ADDED	SPIKED RESULT	% REC.	DUP. SPIKED RESULT	DUP. % REC.	RPD
FUEL HYDROCARBONS (GASOLINE)	ND	ND	NC	N/A	N/A	N/A	N/A	N/A	N/A

NC = Not Calculable.

$$\% \text{ Recovery} = \frac{(\text{Spiked Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative \% Difference)} = \frac{|(\text{Spike Result} - \text{Dup. Spike Result})|}{\text{Average Result}} \times 100$$

ATI I.D. # 9209-154

TOTAL PETROLEUM HYDROCARBONS ANALYSIS
QUALITY CONTROL DATA

CLIENT : GEOENGINEERS, INC.	SAMPLE I.D. # : 9209-154-6
PROJECT # : 0372-080-R04	DATE EXTRACTED : 09/19/92
PROJECT NAME : CHEVRON - BELLINGHAM	DATE ANALYZED : 09/20/92
METHOD : WA DOE WTPH-G	UNITS : mg/Kg
SAMPLE MATRIX : SOIL	

COMPOUND	SAMPLE RESULT	SPIKE ADDED	SPIKED RESULT	% REC.	DUP. SPIKED RESULT	DUP. % REC.	RPD
FUEL HYDROCARBONS (GASOLINE)	ND	109	84	77	89	82	6

$$\% \text{ Recovery} = \frac{(\text{Spiked Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative \% Difference)} = \frac{|(\text{Spike Result} - \text{Dup. Spike Result})|}{\text{Average Result}} \times 100$$

ATI I.D. # 9209-154

TOTAL PETROLEUM HYDROCARBONS ANALYSIS
QUALITY CONTROL DATA

CLIENT : GEOENGINEERS, INC.
PROJECT # : 0372-080-R04
PROJECT NAME : CHEVRON - BELLINGHAM
METHOD : WA DOE WTPH-G
SAMPLE MATRIX : SOIL

SAMPLE I.D. # : BLANK SPIKE
DATE EXTRACTED : 09/19/92
DATE ANALYZED : 09/20/92
UNITS : mg/Kg

COMPOUND	SAMPLE RESULT	SPIKE ADDED	SPIKED RESULT	% REC.	DUP. SPIKED RESULT	DUP. % REC.	RPD
FUEL HYDROCARBONS (GASOLINE)	ND	100	105	105	104	104	1

$$\text{Recovery} = \frac{(\text{Spiked Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative \% Difference)} = \frac{|(\text{Spike Result} - \text{Dup. Spike Result})|}{\text{Average Result}} \times 100$$

ATI I.D. # 9209-154

CASE NARRATIVE

CLIENT : GEOENGINEERS, INC.
PROJECT # : 0372-080-R04
PROJECT NAME : CHEVRON - BELLINGHAM

CASE NARRATIVE: TOTAL PETROLEUM HYDROCARBONS (WA DOE WTPH-D) ANALYSIS

Twenty (20) grams of sample was extracted with methylene chloride by horn sonication in accordance with EPA method 3550. The final sample volume was 10.0 mls.

The extracts were analyzed using a gas chromatograph with an FID detector. The resulting chromatograms were quantitated between C12 and C24 using at least five point calibration curves.

The sample which was used for the matrix spike and matrix spike duplicate (MS/MSD) required a 200 fold dilution. The MS and MSD were spiked with diesel at 250 mg/Kg. The amount spiked was insufficient to be quantitated at this dilution. The blank spike and blank spike duplicate (BS/BSD) were analyzed and reported.

ATI I.D. # 9209-154

TOTAL PETROLEUM HYDROCARBONS ANALYSIS
DATA SUMMARY

CLIENT : GEOENGINEERS, INC.
PROJECT # : 0372-080-R04
PROJECT NAME : CHEVRON - BELLINGHAM
CLIENT I.D. : REAGENT BLANK
SAMPLE MATRIX : SOIL
METHOD : WA DOE WTPH-D
RESULTS ARE CORRECTED FOR MOISTURE CONTENT

DATE SAMPLED : N/A
DATE RECEIVED : N/A
DATE EXTRACTED : 09/19/92
DATE ANALYZED : 09/20/92
UNITS : mg/Kg
DILUTION FACTOR : 1

COMPOUND	MDL	RESULT
FUEL HYDROCARBONS	20	ND
HYDROCARBON RANGE		C12 - C24
HYDROCARBON QUANTITATION USING		DIESEL

SURROGATE PERCENT RECOVERY

O-TERPHENYL	107
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ATI I.D. # 9209-154-8

TOTAL PETROLEUM HYDROCARBONS ANALYSIS
DATA SUMMARY

CLIENT : GEOENGINEERS, INC.
PROJECT # : 0372-080-R04
PROJECT NAME : CHEVRON - BELLINGHAM
CLIENT I.D. : 920916-TP8-2
SAMPLE MATRIX : SOIL
METHOD : WA DOE WTPH-D
RESULTS ARE CORRECTED FOR MOISTURE CONTENT

DATE SAMPLED : 09/16/92
DATE RECEIVED : 09/17/92
DATE EXTRACTED : 09/19/92
DATE ANALYZED : 09/20/92
UNITS : mg/Kg
DILUTION FACTOR : 1

COMPOUND	MDL	RESULT
FUEL HYDROCARBONS	22	ND
HYDROCARBON RANGE		C12 - C24
HYDROCARBON QUANTITATION USING		DIESEL

SURROGATE PERCENT RECOVERY

O-TERPHENYL	108
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ATI I.D. # 9209-154

TOTAL PETROLEUM HYDROCARBONS ANALYSIS
QUALITY CONTROL DATA

CLIENT : GEOENGINEERS, INC.
PROJECT # : 0372-080-R04
PROJECT NAME : CHEVRON - BELLINGHAM
METHOD : WA DOE WTPH-D
SAMPLE MATRIX : SOIL

SAMPLE I.D. # : 209548-1
DATE EXTRACTED : 09/19/92
DATE ANALYZED : 09/20/92
UNITS : mg/Kg

COMPOUND	SAMPLE RESULT	DUP. RESULT	RPD	SPIKE ADDED	SPIKED RESULT	% REC.	DUP. SPIKED RESULT	DUP. % REC.	RPD
FUEL HYDROCARBONS (DIESEL)	67,000	70,000	4	N/A	N/A	N/A	N/A	N/A	N/A

$$\% \text{ Recovery} = \frac{(\text{Spiked Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative \% Difference)} = \frac{|(\text{Spike Result} - \text{Dup. Spike Result})|}{\text{Average Result}} \times 100$$

ATI I.D. # 9209-154

TOTAL PETROLEUM HYDROCARBONS ANALYSIS
QUALITY CONTROL DATA

CLIENT	: GEOENGINEERS, INC.	SAMPLE I.D. #	: BLANK SPIKE
PROJECT #	: 0372-080-R04	DATE EXTRACTED	: 09/19/92
PROJECT NAME	: CHEVRON - BELLINGHAM	DATE ANALYZED	: 09/20/92
METHOD	: WA DOE WTPH-D	UNITS	: mg/Kg
SAMPLE MATRIX	: SOIL		

COMPOUND	SAMPLE RESULT	SPIKE ADDED	SPIKED RESULT	% REC.	DUP. SPIKED RESULT	DUP. % REC.	RPD
FUEL HYDROCARBONS (DIESEL)	ND	250	231	92	251	100	8

$$\% \text{ Recovery} = \frac{(\text{Spiked Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative \% Difference)} = \frac{|(\text{Spike Result} - \text{Dup. Spike Result})|}{\text{Average Result}} \times 100$$

ATI I.D. # 9209-154

TOTAL PETROLEUM HYDROCARBONS
DATA SUMMARY

CLIENT : GEOENGINEERS, INC. DATE EXTRACTED : 09/20/92
PROJECT # : 0372-080-R04 DATE ANALYZED : 09/21/92
PROJECT NAME : CHEVRON - BELLINGHAM UNITS : mg/Kg
METHOD : WA DOE WTPH-418.1 MODIFIED SAMPLE MATRIX : SOIL
RESULTS ARE CORRECTED FOR MOISTURE CONTENT

ATI I.D. #	CLIENT I.D.	MDL	TOTAL PETROLEUM HYDROCARBONS
9209-154-8	920916-TP8-2	112	ND
REAGENT BLANK	-	100	ND

ATI I.D. # 9209-154

TOTAL PETROLEUM HYDROCARBONS
QUALITY CONTROL DATA

CLIENT : GEOENGINEERS, INC.	SAMPLE I.D. # : 9209-154-8
PROJECT # : 0372-080-R04	DATE EXTRACTED : 09/20/92
PROJECT NAME : CHEVRON - BELLINGHAM	DATE ANALYZED : 09/21/92
METHOD : WA DOE WTPH-418.1 MODIFIED UNITS	: mg/Kg
SAMPLE MATRIX : SOIL	

COMPOUND	SAMPLE RESULT	SAMPLE DUP. RESULT	RPD	SPIKE ADDED	SPIKED RESULT	% REC.	DUP. SPIKED RESULT	DUP. % REC.	RPD
3-COMPONENT OIL	ND	N/A	N/A	1,100	820	75	890	81	8

$$\% \text{ Recovery} = \frac{(\text{Spiked Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative \% Difference)} = \frac{|(\text{Spike Result} - \text{Dup. Spike Result})|}{\text{Average Result}} \times 100$$

ATI I.D. # 9209-154

TOTAL PETROLEUM HYDROCARBONS
QUALITY CONTROL DATA

CLIENT : GEOENGINEERS, INC.	SAMPLE I.D. # : BLANK SPIKE
PROJECT # : 0372-080-R04	DATE EXTRACTED : 09/20/92
PROJECT NAME : CHEVRON - BELLINGHAM	DATE ANALYZED : 09/21/92
METHOD : WA DOE WTPH-418.1 MODIFIED UNITS	: mg/Kg
SAMPLE MATRIX : SOIL	

COMPOUND	SAMPLE RESULT	SAMPLE DUP. RESULT	RPD	SPIKE ADDED	SPIKED RESULT	% REC.	DUP. SPIKED RESULT	DUP. % REC.	RPD
3-COMPONENT OIL	ND	N/A	N/A	1,000	950	95	950	95	0

$$\% \text{ Recovery} = \frac{(\text{Spiked Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative \% Difference)} = \frac{|(\text{Spike Result} - \text{Dup. Spike Result})|}{\text{Average Result}} \times 100$$

ATI I.D. # 9209-154

GENERAL CHEMISTRY ANALYSIS

CLIENT : GEOENGINEERS, INC.
PROJECT # : 0372-080-R04
PROJECT NAME : CHEVRON - BELLINGHAM

MATRIX : SOIL

PARAMETERDATE ANALYZED

MOISTURE

09/19/92



ATI I.D. # 9209-154

GENERAL CHEMISTRY ANALYSIS
DATA SUMMARY

CLIENT : GEOENGINEERS, INC.
PROJECT # : 0372-080-R04
PROJECT NAME : CHEVRON - BELLINGHAM

MATRIX : SOIL

UNITS : %

ATI I.D. #	CLIENT I.D.	MOISTURE MDL	RESULT
9209-154-1	920916-TP-4	0.5	12
9209-154-2	920916-TP-5	0.5	12
9209-154-3	920916-TP6	0.5	11
9209-154-4	920916-TP6-2	0.5	16
9209-154-5	920916-TP6-3	0.5	27
9209-154-6	920916-TP7	0.5	8
9209-154-7	920916-TP8	0.5	10
9209-154-8	920916-TP8-2	0.5	11



ATI I.D. # 9209-154

GENERAL CHEMISTRY ANALYSIS
QUALITY CONTROL DATA

CLIENT : GEOENGINEERS, INC.
PROJECT # : 0372-080-R04
PROJECT NAME : CHEVRON - BELLINGHAM

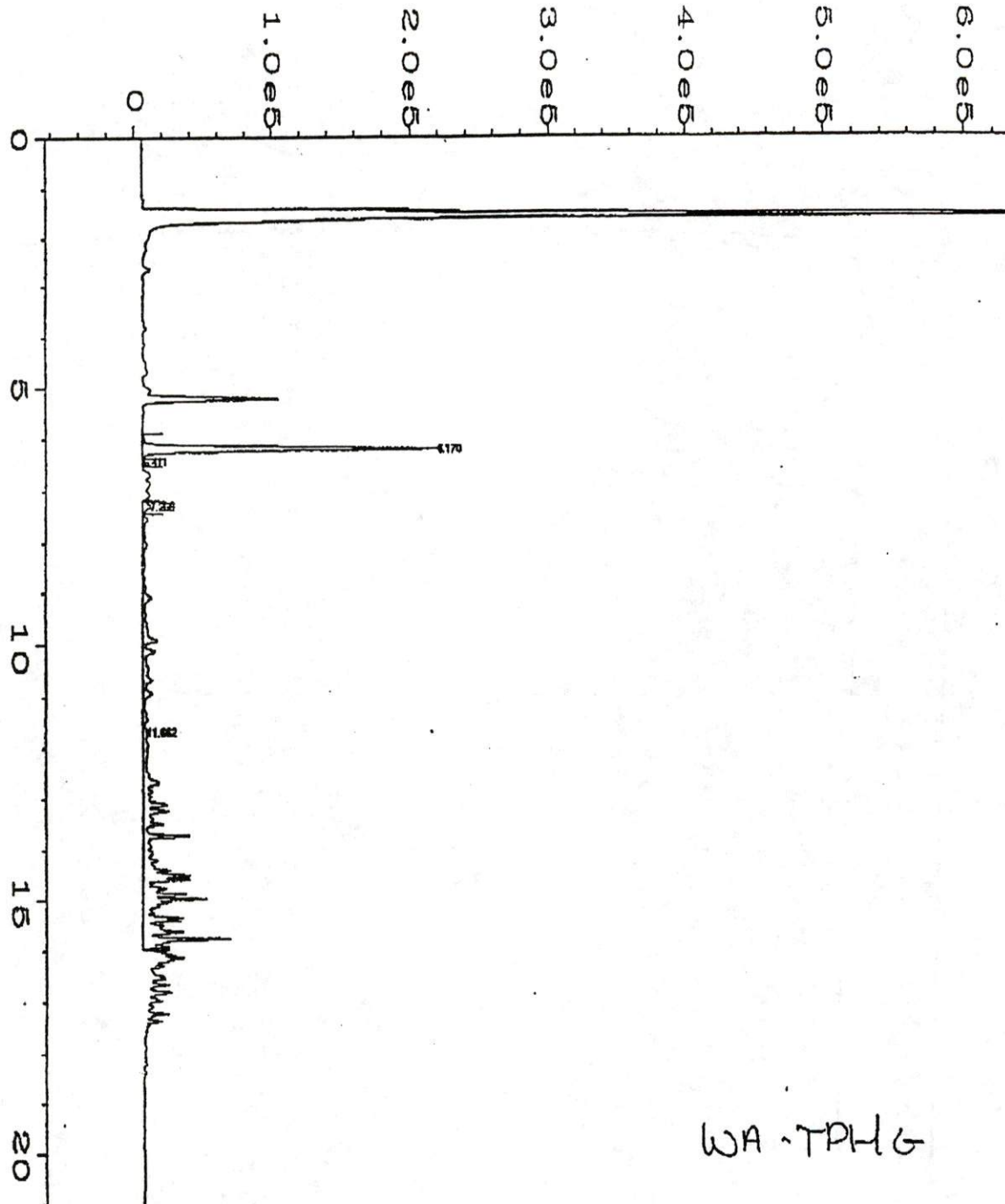
MATRIX : SOIL

UNITS : %

PARAMETER	ATI I.D.	SAMPLE RESULT	DUP RESULT	RPD	SPIKED RESULT	SPIKE ADDED	% REC
MOISTURE	209548-1	10	11	10	N/A	N/A	N/A
MOISTURE	9209-154-6	8	8	0	N/A	N/A	N/A

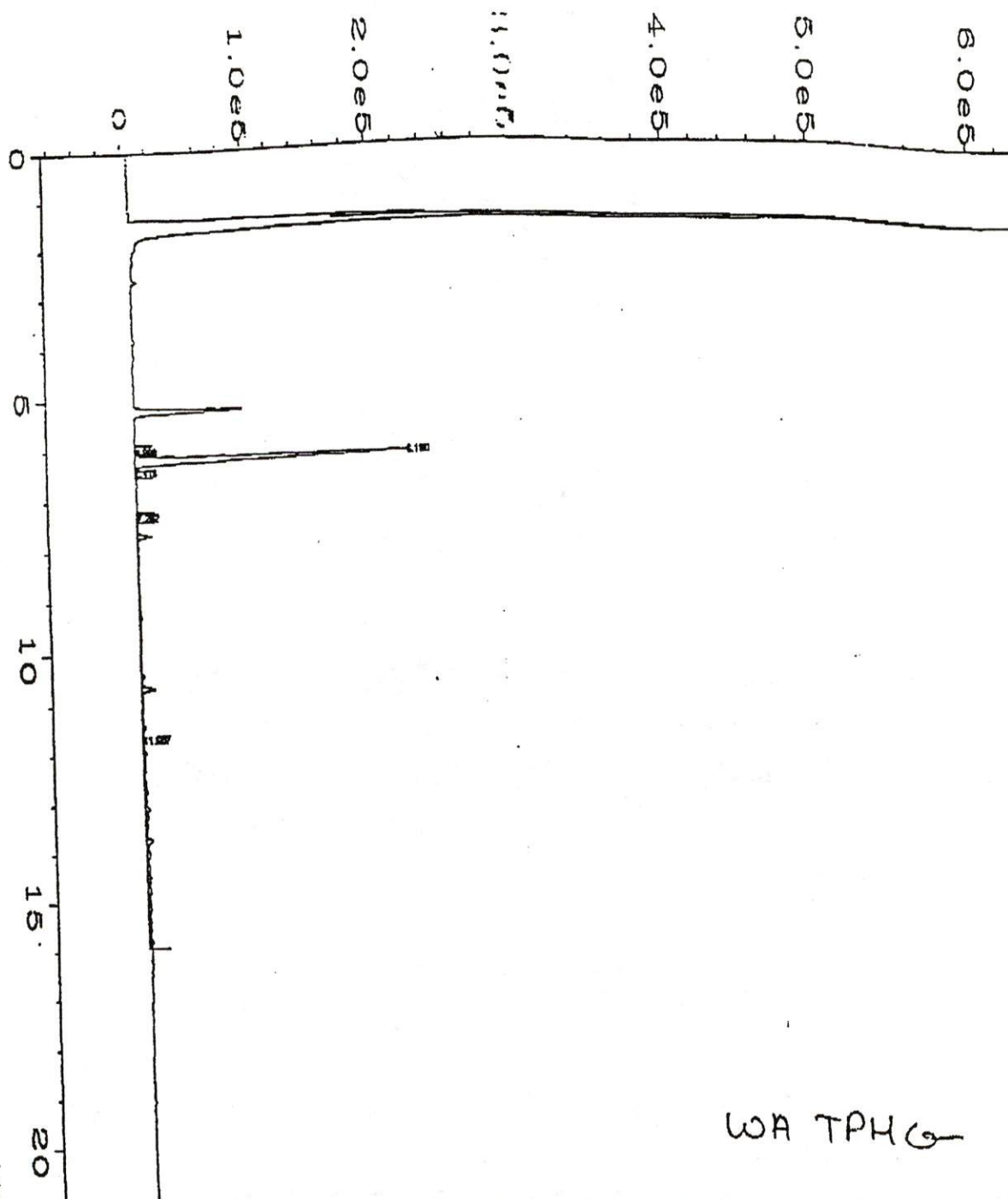
$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative \% Difference)} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 100$$

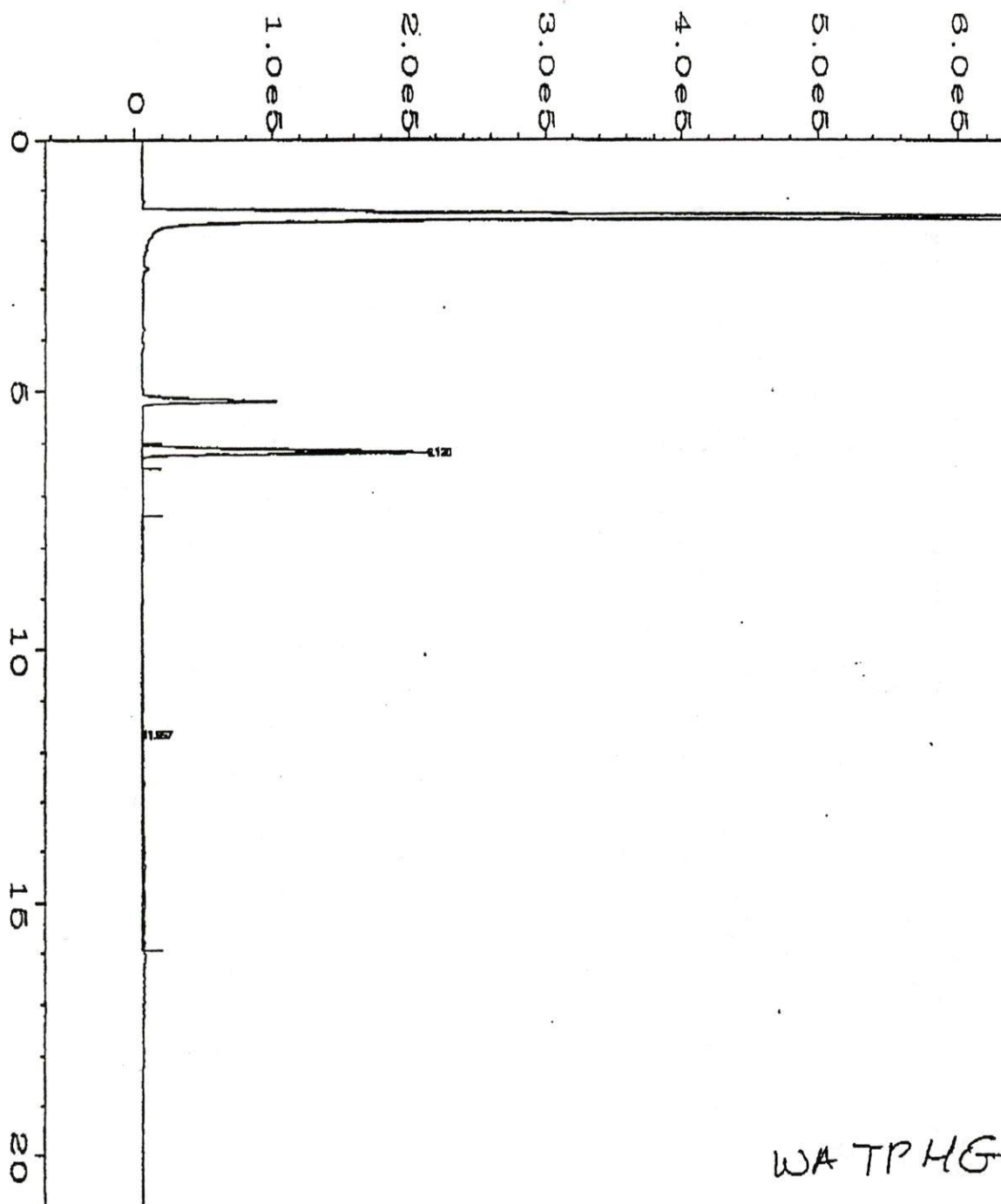


WA-TPH-G

Data File Name	: F:\DATA\FUELS\WATSON\D\920920\006R0101.D	Page Number	: 1
Operator	: FUELS !!!!!	Vial Number	: 6
Instrument	: WATSON	Injection Number	: 1
Sample Name	: 209549-1 920916-TP4	Sequence Line	: 1
Run Time Bar Code:		Instrument Method:	TPHG.MTH
Acquired on	: 20 Sep 92 12:03 PM	Analysis Method	: WTPHG.MTH
Report Created on:	: 20 Sep 92 02:03 PM	Sample Amount	: 0
Last Recalib on	: 09 SEP 92 01:12 PM	ISTD Amount	:
Multiplier	: 1		

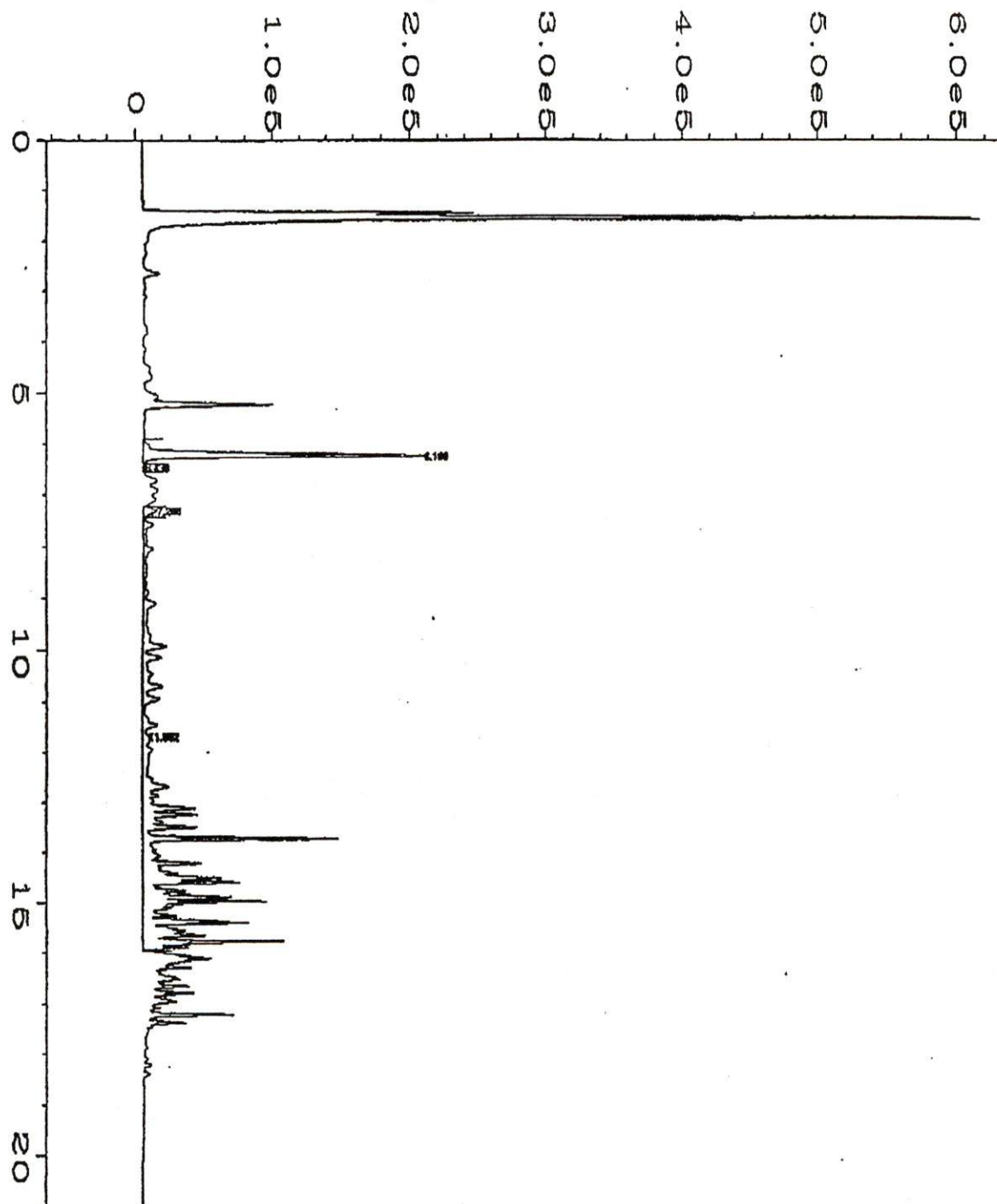


File Name	: F:\DATA\FUELS\WATSON\D\920920\008R0101.D	Page Number	: 1
Pr	: FUELS 11111	Vial Number	: 8
ment	: WATSON	Injection Number	: 1
Name	: 209549-3 920916-TP6	Sequence Line	: 1
File Bar Code	: 20 Sep 92 12:59 PM	Instrument Method	: TPHG.MTH
Ad on	: 20 Sep 92 02:06 PM	Analysis Method	: WTPHG.MTH
Created on	: 09 SEP 92 01:12 PM	Sample Amount	: 0
Calib on	: 1	ISTD Amount	: 1



WA TPHG

ata File Name	: F:\DATA\FUELS\WATSON\D\920920\012R0101.D	Page Number	: 1
perator	: FUELS !!!!!	Vial Number	: 12
Instrument	: WATSON	Injection Number	: 1
Sample Name	: 209549-7 920916-TP8	Sequence Line	: 1
Run Time Bar Code:		Instrument Method	: TPHG.MTH
Acquired on	: 20 Sep 92 02:49 PM	Analysis Method	: WTPHG.MTH
Report Created on:	: 20 Sep 92 04:22 PM	Sample Amount	: 0
Last Recalib on	: 09 SEP 92 01:12 PM	ISTD Amount	:
Multiplier	: 1		



Data File Name	: F:\DATA\FUELS\WATSON\D\920920\009R0101.D	Page Number	: 1
Operator	: FUELS !!!!!	Vial Number	: 9
Instrument	: WATSON	Injection Number	: 1
Sample Name	: 209549-4 920916-TPG-2	Sequence Line	: 1
Run Time Bar Code:		Instrument Method:	TPHG.MTH
Acquired on	: 20 Sep 92 01:27 PM	Analysis Method	: WTPHG.MTH
Report Created on:	20 Sep 92 02:07 PM	Sample Amount	: 0
Last Recalib on	: 09 SEP 92 01:12 PM	ISTD Amount	:
Multiplier	: 1		



560 Naches Avenue SW, Suite 101 Renton, WA 98055 (206)228-8335

DATE 9/16/98 PAGE 1 OF 1

Chain of Custody

LABORATORY NUMBER: 9209-150

[illegible]



560 Naches Avenue SW, Suite 101 Renton, WA 98055 (206)228-8335

TO PENSACOLA, FL

PTL

DATE 9/18/92 PAGE 1 OF 1
NUMBER: 205557 ATC 9/18/92
209549 9/20/92

Chain of Custody

LABORATORY NUMBER: 204557 209549 99141

[illegible]

PROJECT INFORMATION		SAMPLE RECEIPT		RELINQUISHED BY: 1.		RELINQUISHED BY: 2.		RELINQUISHED BY: 3.	
ATI PROJ #: 9209-154		TOTAL NUMBER OF CONTAINERS	1	Signature: Omer G. G. 16:00	Time:	Signature:	Time:	Signature:	Time:
ATI PROJ NAME: GBD		COC SEALS/INTACT? Y/N/NA	Y	Printed Name: S. McKee	Date: 9/18/92	Printed Name:	Date:	Printed Name:	Date:
CLIENT PROJ: 372-080-124		RECEIVED GOOD COND./COLD	Y	Company: AT&T		Company:		Company:	
chevron - B-ham		RECEIVED VIA: Fed X		RECEIVED BY: 1.		RECEIVED BY: 2.		RECEIVED BY: (LAB) 3.	
SPECIAL INSTRUCTIONS:				Signature: [Signature]	Time: 11:30	Signature:	Time:	Signature:	Time:
VERBALS DUE: 9/22				Printed Name: Alvin Kleinschmidt	Date: 9/18/92	Printed Name:	Date:	Printed Name:	Date:
HARDCOPY DUE: _____				Company: AT&T		Company:		Analytical Technologies, Inc.	
PRICE: _____ DISC: _____									
DIGESTION NEEDED?									



Analytical Technologies, Inc.

560 Naches Avenue SW, Suite 101 Renton, WA 98055 (206) 228-8335

TO PENSACOLA, FL

PTL

DATE 9/17/92 PAGE 1 OF 1

Chain of Custody

LABORATORY NUMBER: 209549

PROJECT MANAGER: Donna McKinney

ANALYTICAL TECHNOLOGIES, INC.
560 NACHES AVE SW, SUITE 101
RENTON, WA 98055
(206) 228-8335

SAMPLE DISPOSAL INSTRUCTIONS

☒ ATI Disposal

☐ Return

ANALYSIS REQUEST

SAMPLE ID	DATE	TIME	MATRIX	LAB ID	8240 GC/MS Volatiles	8270 GC/MS BNA's	8310 HPLC PNA's	8080 Pest/PCB's	PCB's only	8150 Herbicides	TOC 9060	TOX 9020	BOD	COD	CYANIDE	MBAS	NITRATE/NITRITE	PP METALS	EPTOX METALS	TCLP METALS	TCLP 8240 (ZHE)	TCLP 8270	TCLP 8150	TCLP 8080	PHENOLS, total	% MOISTURE	BETX	WA 418.1	WTPH-G/BETX	WTPH-D	NUMBER OF CONTAINERS
9209-156 -1	9/16/92		water	1																								X			1
9209-154 -1	9/16/92		soil	21																							X				1
-2				32																						X					1
-3				43																						X					1
-4				54																						X					1
-5				65																						X					1
-6				76																						X					1
-7				87																						X					1
-8	9/16/92		soil	98																						X					1

PROJECT INFORMATION

ATI PROJ #: 9209-156/372-080

ATI PROJ NAME: GEO

CLIENT PROJ: 15169-116 /ETE

chevron-B-ham.

SPECIAL INSTRUCTIONS:

VERBALS DUE: 154 9/24 9/21 noon

HARDCOPY DUE: _____

PRICE: _____ DISC: _____

DIGESTION NEEDED?

RECEIVED VIA FEDEX 9/18 1000 hrs

SAMPLE RECEIPT

TOTAL NUMBER OF CONTAINERS 97

COC SEALS/INTACT? Y/N/NA Y

RECEIVED GOOD COND./COLD Y

RECEIVED VIA: FEDEX

RELINQUISHED BY: 1.

Signature: _____ Time: _____

Printed Name: _____ Date: _____

Company: _____

RECEIVED BY: 1.

Signature: _____ Time: _____

Printed Name: _____ Date: _____

Company: _____

RELINQUISHED BY: 2.

Signature: _____ Time: _____

Printed Name: _____ Date: _____

Company: _____

RECEIVED BY: 2.

Signature: _____ Time: _____

Printed Name: _____ Date: _____

Company: _____

RELINQUISHED BY: 3.

Signature: _____ Time: _____

Printed Name: _____ Date: _____

Company: _____

RECEIVED BY: (LAB) 3.

Signature: _____ Time: _____

Printed Name: _____ Date: _____

Company: Analytical Technologies, Inc.



Analytical **Technologies, Inc.**

560 Naches Avenue, S.W., Suite 101, Renton, WA 98055 (206) 228-8335

ATI I.D. # 9209-241

October 9, 1992

GeoEngineers

GeoEngineers, Inc.
8410 154th Avenue N.E.
Redmond, WA 98052

OCT 13 1992

Routing

File

KRF



Attention : Kurt Fraese

Project Number : 372-080-R04

Project Name : Chevron/Bellingham

On September 23, 1992, Analytical Technologies, Inc., received four soil samples for analysis. The samples were analyzed with EPA methodology or equivalent methods as specified in the attached analytical schedule. The results, sample cross reference, and quality control data are enclosed.


Donna M. McKinney
Senior Project Manager


Frederick W. Grothkopp
Laboratory Manager

FWG/hal/hbb

ATI I.D. # 9209-241

SAMPLE CROSS REFERENCE SHEET

CLIENT : GEOENGINEERS, INC.
PROJECT # : 372-080-R04
PROJECT NAME : CHEVRON/BELLINGHAM

ATI #	CLIENT DESCRIPTION	DATE SAMPLED	MATRIX
9209-241-1	920922-G1	09/22/92	SOIL
9209-241-2	920922-G2	09/22/92	SOIL
9209-241-3	920922-G3	09/22/92	SOIL
9209-241-4	920922-G4	09/22/92	SOIL

----- TOTALS -----

MATRIX	# SAMPLES
SOIL	4

ATI STANDARD DISPOSAL PRACTICE

The samples from this project will be disposed of in thirty (30) days from the date of the report. If an extended storage period is required, please contact our sample control department before the scheduled disposal date.

ATI I.D. # 9209-241

ANALYTICAL SCHEDULE

CLIENT : GEOENGINEERS, INC.
PROJECT # : 372-080-R04
PROJECT NAME : CHEVRON/BELLINGHAM

ANALYSIS	TECHNIQUE	REFERENCE	LAB
BETX	GC/PID	EPA 8020	PTL
TOTAL PETROLEUM HYDROCARBONS	GC/FID	WA DOE WTPH-G	PTL
MOISTURE	GRAVIMETRIC	CLP SOW ILM01.0	PTL

R = ATI - Renton
SD = ATI - San Diego
PHX = ATI - Phoenix
PTL = ATI - Portland
PNR = ATI - Pensacola
FC = ATI - Fort Collins
SUB = Subcontract

ATI I.D. # 9209-241

VOLATILE ORGANIC COMPOUNDS
DATA SUMMARY

CLIENT	: GEOENGINEERS, INC.	DATE SAMPLED	: N/A
PROJECT #	: 372-080-R04	DATE RECEIVED	: N/A
PROJECT NAME	: CHEVRON/BELLINGHAM	DATE EXTRACTED	: 09/24/92
CLIENT I.D.	: REAGENT BLANK	DATE ANALYZED	: 10/01/92
SAMPLE MATRIX	: SOIL	UNITS	: mg/Kg
EPA METHOD	: 8020 (BETX)	DILUTION FACTOR	: 1
RESULTS ARE CORRECTED FOR MOISTURE CONTENT			

COMPOUND	MDL	RESULT
BENZENE	0.025	ND
ETHYLBENZENE	0.025	ND
TOLUENE	0.025	ND
TOTAL XYLENES	0.025	ND

SURROGATE PERCENT RECOVERY

TRIFLUOROTOLUENE	81
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ATI I.D. # 9209-241-1

VOLATILE ORGANIC COMPOUNDS
DATA SUMMARY

CLIENT	: GEOENGINEERS, INC.	DATE SAMPLED	: 09/22/92
PROJECT #	: 372-080-R04	DATE RECEIVED	: 09/23/92
PROJECT NAME	: CHEVRON/BELLINGHAM	DATE EXTRACTED	: 09/24/92
CLIENT I.D.	: 920922-G1	DATE ANALYZED	: 09/29/92
SAMPLE MATRIX	: SOIL	UNITS	: mg/Kg
EPA METHOD	: 8020 (BETX)	DILUTION FACTOR	: 1
RESULTS ARE CORRECTED FOR MOISTURE CONTENT			

COMPOUND	MDL	RESULT
BENZENE	0.031	ND
ETHYLBENZENE	0.031	ND
TOLUENE	0.031	ND
TOTAL XYLENES	0.031	0.037

SURROGATE PERCENT RECOVERY

TRIFLUOROTOLUENE	75
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ATI I.D. # 9209-241-2

VOLATILE ORGANIC COMPOUNDS
DATA SUMMARY

CLIENT : GEOENGINEERS, INC.
PROJECT # : 372-080-R04
PROJECT NAME : CHEVRON/BELLINGHAM
CLIENT I.D. : 920922-G2
SAMPLE MATRIX : SOIL
EPA METHOD : 8020 (BETX)
RESULTS ARE CORRECTED FOR MOISTURE CONTENT

DATE SAMPLED : 09/22/92
DATE RECEIVED : 09/23/92
DATE EXTRACTED : 09/24/92
DATE ANALYZED : 09/29/92
UNITS : mg/Kg
DILUTION FACTOR : 1

COMPOUND	MDL	RESULT
BENZENE	0.028	ND
ETHYLBENZENE	0.028	0.72
TOLUENE	0.028	0.56
TOTAL XYLENES	0.028	1.5

SURROGATE PERCENT RECOVERY

TRIFLUOROTOLUENE 85

ATI I.D. # 9209-241-3

VOLATILE ORGANIC COMPOUNDS
DATA SUMMARY

CLIENT	: GEOENGINEERS, INC.	DATE SAMPLED	: 09/22/92
PROJECT #	: 372-080-R04	DATE RECEIVED	: 09/23/92
PROJECT NAME	: CHEVRON/BELLINGHAM	DATE EXTRACTED	: 09/24/92
CLIENT I.D.	: 920922-G3	DATE ANALYZED	: 09/30/92
SAMPLE MATRIX	: SOIL	UNITS	: mg/Kg
EPA METHOD	: 8020 (BETX)	DILUTION FACTOR	: 1
RESULTS ARE CORRECTED FOR MOISTURE CONTENT			

COMPOUND	MDL	RESULT
BENZENE	0.032	ND
ETHYLBENZENE	0.032	ND
TOLUENE	0.032	ND
TOTAL XYLENES	0.032	0.048

SURROGATE PERCENT RECOVERY

TRIFLUOROTOLUENE	70
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ATI I.D. # 9209-241-4

VOLATILE ORGANIC COMPOUNDS
DATA SUMMARY

CLIENT	: GEOENGINEERS, INC.	DATE SAMPLED	: 09/22/92
PROJECT #	: 372-080-R04	DATE RECEIVED	: 09/23/92
PROJECT NAME	: CHEVRON/BELLINGHAM	DATE EXTRACTED	: 09/24/92
CLIENT I.D.	: 920922-G4	DATE ANALYZED	: 09/29/92
SAMPLE MATRIX	: SOIL	UNITS	: mg/Kg
EPA METHOD	: 8020 (BETX)	DILUTION FACTOR	: 1
RESULTS ARE CORRECTED FOR MOISTURE CONTENT			

COMPOUND	MDL	RESULT
BENZENE	0.035	ND
ETHYLBENZENE	0.035	ND
TOLUENE	0.035	ND
TOTAL XYLENES	0.035	ND

SURROGATE PERCENT RECOVERY

TRIFLUOROTOLUENE	72
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ATI I.D. # 9209-241

VOLATILE ORGANIC COMPOUNDS
QUALITY CONTROL DATA

CLIENT : GEOENGINEERS, INC.	SAMPLE I.D. : 9209-241-1
PROJECT # : 372-080-R04	DATE EXTRACTED : 09/24/92
PROJECT NAME : CHEVRON/BELLINGHAM	DATE ANALYZED : 09/29/92
EPA METHOD : 8020 (BETX)	MATRIX : SOIL
RESULTS ARE CORRECTED FOR MOISTURE CONTENT	UNITS : mg/Kg

COMPOUND	SAMPLE RESULT	SPIKE ADDED	SPIKED SAMPLE	% REC	DUP SPIKED SAMPLE	DUP % REC	RPD
BENZENE	ND	1.23	0.96	78	0.99	80	3
ETHYLBENZENE	ND	1.23	0.93	76	0.97	79	4
TOLUENE	ND	1.23	0.91	74	0.96	78	5
TOTAL XYLENES	0.037	2.47	1.95	77	2.02	80	4

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative \% Difference)} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 100$$

ATI I.D. # 9209-241

VOLATILE ORGANIC COMPOUNDS
QUALITY CONTROL DATA

CLIENT : GEOENGINEERS, INC.	SAMPLE I.D. : BLANK SPIKE
PROJECT # : 372-080-R04	DATE EXTRACTED : 09/24/92
PROJECT NAME : CHEVRON/BELLINGHAM	DATE ANALYZED : 10/01/92
EPA METHOD : 8020 (BETX)	MATRIX : SOIL
RESULTS ARE CORRECTED FOR MOISTURE CONTENT	UNITS : mg/Kg

COMPOUND	SAMPLE RESULT	SPIKE ADDED	SPIKED SAMPLE	% REC	DUP SPIKED SAMPLE	DUP % REC	RPD
BENZENE	ND	1.00	0.85	85	0.91	91	7
ETHYLBENZENE	ND	1.00	0.92	92	0.98	98	6
TOLUENE	ND	1.00	0.89	89	0.95	95	7
TOTAL XYLENES	ND	2.00	1.93	97	2.04	102	6

$$\text{Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative \% Difference)} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 100$$

ATI I.D. # 9209-241

TOTAL PETROLEUM HYDROCARBON ANALYSIS
DATA SUMMARY

CLIENT	: GEOENGINEERS, INC.	DATE SAMPLED	: N/A
PROJECT #	: 372-080-R04	DATE RECEIVED	: N/A
PROJECT NAME	: CHEVRON/BELLINGHAM	DATE EXTRACTED	: 09/24/92
CLIENT I.D.	: REAGENT BLANK	DATE ANALYZED	: 09/27/92
SAMPLE MATRIX	: SOIL	UNITS	: mg/Kg
METHOD	: WA DOE WTPH-G	DILUTION FACTOR	: 1
RESULTS ARE CORRECTED FOR MOISTURE CONTENT			

COMPOUND	MDL	RESULT
FUEL HYDROCARBONS	5.0	ND
HYDROCARBON RANGE		TOLUENE TO DODECANE
HYDROCARBON QUANTITATION USING		GASOLINE

SURROGATE PERCENT RECOVERY

TRIFLUOROTOLUENE	89
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ATI I.D. # 9209-241

TOTAL PETROLEUM HYDROCARBON ANALYSIS
DATA SUMMARY

CLIENT	: GEOENGINEERS, INC.	DATE SAMPLED	: N/A
PROJECT #	: 372-080-R04	DATE RECEIVED	: N/A
PROJECT NAME	: CHEVRON/BELLINGHAM	DATE EXTRACTED	: 10/02/92
CLIENT I.D.	: REAGENT BLANK	DATE ANALYZED	: 10/02/92
SAMPLE MATRIX	: SOIL	UNITS	: mg/Kg
METHOD	: WA DOE WTPH-G	DILUTION FACTOR	: 1
RESULTS ARE CORRECTED FOR MOISTURE CONTENT			

COMPOUND	MDL	RESULT
FUEL HYDROCARBONS	5.0	ND
HYDROCARBON RANGE		TOLUENE TO DODECANE
HYDROCARBON QUANTITATION USING		GASOLINE

SURROGATE PERCENT RECOVERY

TRIFLUOROTOLUENE	100
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ATI I.D. # 9209-241-1

TOTAL PETROLEUM HYDROCARBON ANALYSIS
DATA SUMMARY

CLIENT	: GEOENGINEERS, INC.	DATE SAMPLED	: 09/22/92
PROJECT #	: 372-080-R04	DATE RECEIVED	: 09/23/92
PROJECT NAME	: CHEVRON/BELLINGHAM	DATE EXTRACTED	: 09/24/92
CLIENT I.D.	: 920922-G1	DATE ANALYZED	: 09/27/92
SAMPLE MATRIX	: SOIL	UNITS	: mg/Kg
METHOD	: WA DOE WTPH-G	DILUTION FACTOR	: 1

RESULTS ARE CORRECTED FOR MOISTURE CONTENT

COMPOUND	MDL	RESULT
FUEL HYDROCARBONS	6.2	ND
HYDROCARBON RANGE		TOLUENE TO DODECANE
HYDROCARBON QUANTITATION USING		GASOLINE

SURROGATE PERCENT RECOVERY

TRIFLUOROTOLUENE	61
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ATI I.D. # 9209-241-2

TOTAL PETROLEUM HYDROCARBON ANALYSIS
DATA SUMMARY

CLIENT : GEOENGINEERS, INC.
PROJECT # : 372-080-R04
PROJECT NAME : CHEVRON/BELLINGHAM
CLIENT I.D. : 920922-G2
SAMPLE MATRIX : SOIL
METHOD : WA DOE WTPH-G
RESULTS ARE CORRECTED FOR MOISTURE CONTENT

DATE SAMPLED : 09/22/92
DATE RECEIVED : 09/23/92
DATE EXTRACTED : 09/24/92
DATE ANALYZED : 09/29/92
UNITS : mg/Kg
DILUTION FACTOR : 1

COMPOUND	MDL	RESULT
FUEL HYDROCARBONS	5.7	140
HYDROCARBON RANGE		TOLUENE TO DODECANE
HYDROCARBON QUANTITATION USING		GASOLINE

SURROGATE PERCENT RECOVERY

TRIFLUOROTOLUENE 77



ATI I.D. # 9209-241-3

TOTAL PETROLEUM HYDROCARBON ANALYSIS
DATA SUMMARY

CLIENT : GEOENGINEERS, INC.
PROJECT # : 372-080-R04
PROJECT NAME : CHEVRON/BELLINGHAM
CLIENT I.D. : 920922-G3
SAMPLE MATRIX : SOIL
METHOD : WA DOE WTPH-G
RESULTS ARE CORRECTED FOR MOISTURE CONTENT

DATE SAMPLED : 09/22/92
DATE RECEIVED : 09/23/92
DATE EXTRACTED : 10/02/92
DATE ANALYZED : 10/02/92
UNITS : mg/Kg
DILUTION FACTOR : 1

COMPOUND	MDL	RESULT
FUEL HYDROCARBONS	6.3	ND
HYDROCARBON RANGE		TOLUENE TO DODECANE
HYDROCARBON QUANTITATION USING		GASOLINE

SURROGATE PERCENT RECOVERY

TRIFLUOROTOLUENE 76

ATI I.D. # 9209-241-4

TOTAL PETROLEUM HYDROCARBON ANALYSIS
DATA SUMMARY

CLIENT	: GEOENGINEERS, INC.	DATE SAMPLED	: 09/22/92
PROJECT #	: 372-080-R04	DATE RECEIVED	: 09/23/92
PROJECT NAME	: CHEVRON/BELLINGHAM	DATE EXTRACTED	: 09/24/92
CLIENT I.D.	: 920922-G4	DATE ANALYZED	: 09/29/92
SAMPLE MATRIX	: SOIL	UNITS	: mg/Kg
METHOD	: WA DOE WTPH-G	DILUTION FACTOR	: 1
RESULTS ARE CORRECTED FOR MOISTURE CONTENT			

COMPOUND	MDL	RESULT
FUEL HYDROCARBONS	7.0	ND
HYDROCARBON RANGE		TOLUENE TO DODECANE
HYDROCARBON QUANTITATION USING		GASOLINE

SURROGATE PERCENT RECOVERY

TRIFLUOROTOLUENE	59
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ATI I.D. # 9209-241

TOTAL PETROLEUM HYDROCARBON ANALYSIS
QUALITY CONTROL DATA

CLIENT : GEOENGINEERS, INC.	SAMPLE I.D. # : 9209-241-2
PROJECT # : 372-080-R04	DATE EXTRACTED : 09/24/92
PROJECT NAME : CHEVRON/BELLINGHAM	DATE ANALYZED : 09/29/92
METHOD : WA DOE WTPH-G	UNITS : mg/Kg
SAMPLE MATRIX : SOIL	
RESULTS ARE CORRECTED FOR MOISTURE CONTENT	

COMPOUND	SAMPLE RESULT	SAMPLE DUP. RESULT	RPD	SPIKE ADDED	SPIKED RESULT	%	DUP. SPIKED RESULT	DUP. %	REC.	RPD
PETROLEUM HYDROCARBONS (GASOLINE)	140	140	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A

$$\% \text{ Recovery} = \frac{(\text{Spiked Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative \% Difference)} = \frac{|(\text{Spike Result} - \text{Dup. Spike Result})|}{\text{Average Result}} \times 100$$

ATI I.D. # 9209-241

TOTAL PETROLEUM HYDROCARBON ANALYSIS
QUALITY CONTROL DATA

CLIENT : GEOENGINEERS, INC.	SAMPLE I.D. # : 9209-241-1
PROJECT # : 372-080-R04	DATE EXTRACTED : 09/24/92
PROJECT NAME : CHEVRON/BELLINGHAM	DATE ANALYZED : 09/27/92
METHOD : WA DOE WTPH-G	UNITS : mg/Kg
SAMPLE MATRIX : SOIL	
RESULTS ARE CORRECTED FOR MOISTURE CONTENT	

COMPOUND	SAMPLE RESULT	SPIKE ADDED	SPIKED RESULT	% REC.	DUP. SPIKED RESULT	DUP. % REC.	RPD
PETROLEUM HYDROCARBONS (GASOLINE)	ND	123	93.7	76	101	82	7

$$\text{Recovery} = \frac{(\text{Spiked Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative \% Difference)} = \frac{|(\text{Spike Result} - \text{Dup. Spike Result})|}{\text{Average Result}} \times 100$$

ATI I.D. # 9209-241

TOTAL PETROLEUM HYDROCARBON ANALYSIS
QUALITY CONTROL DATA

CLIENT : GEOENGINEERS, INC.	SAMPLE I.D. # : 210504-3
PROJECT # : 372-080-R04	DATE EXTRACTED : 10/02/92
PROJECT NAME : CHEVRON/BELLINGHAM	DATE ANALYZED : 10/02/92
METHOD : WA DOE WTPH-G	UNITS : mg/Kg
SAMPLE MATRIX : SOIL	
RESULTS ARE CORRECTED FOR MOISTURE CONTENT	

COMPOUND	SAMPLE RESULT	SPIKE ADDED	SPIKED RESULT	% REC.	DUP. SPIKED RESULT	DUP. % REC.	RPD
PETROLEUM HYDROCARBONS (GASOLINE)	ND	115	112	97	114	99	2

$$\% \text{ Recovery} = \frac{(\text{Spiked Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative \% Difference)} = \frac{|(\text{Spike Result} - \text{Dup. Spike Result})|}{\text{Average Result}} \times 100$$



ATI I.D. # 9209-241

TOTAL PETROLEUM HYDROCARBON ANALYSIS
QUALITY CONTROL DATA

CLIENT : GEOENGINEERS, INC. SAMPLE I.D. # : BLANK SPIKE
PROJECT # : 372-080-R04 DATE EXTRACTED : 09/24/92
PROJECT NAME : CHEVRON/BELLINGHAM DATE ANALYZED : 09/27/92
METHOD : WA DOE WTPH-G UNITS : mg/Kg
SAMPLE MATRIX : SOIL
RESULTS ARE CORRECTED FOR MOISTURE CONTENT

COMPOUND	SAMPLE RESULT	SPIKE ADDED	SPIKED RESULT	% REC.	DUP. SPIKED RESULT	DUP. % REC.	RPD
PETROLEUM HYDROCARBONS (GASOLINE)	ND	100	102	102	105	105	3

$$\% \text{ Recovery} = \frac{(\text{Spiked Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative \% Difference)} = \frac{|(\text{Spike Result} - \text{Dup. Spike Result})|}{\text{Average Result}} \times 100$$

ATI I.D. # 9209-241

GENERAL CHEMISTRY ANALYSIS

CLIENT : GEOENGINEERS, INC.
PROJECT # : 372-080-R04
PROJECT NAME : CHEVRON/BELLINGHAM

MATRIX : SOIL

PARAMETER	DATE ANALYZED
-----------	---------------

MOISTURE	09/24/92
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ATI I.D. # 9209-241

GENERAL CHEMISTRY ANALYSIS
DATA SUMMARY

CLIENT : GEOENGINEERS, INC.
PROJECT # : 372-080-R04
PROJECT NAME : CHEVRON/BELLINGHAM

MATRIX : SOIL

UNITS : %

ATI I.D. #	CLIENT I.D.	MOISTURE MDL	RESULT
9209-241-1	920922-G1	0.5	19
9209-241-2	920922-G2	0.5	12
9209-241-3	920922-G3	0.5	21
9209-241-4	920922-G4	0.5	29



ATI I.D. # 9209-241

GENERAL CHEMISTRY ANALYSIS
QUALITY CONTROL DATA

CLIENT : GEOENGINEERS, INC.
PROJECT # : 372-080-R04
PROJECT NAME : CHEVRON/BELLINGHAM

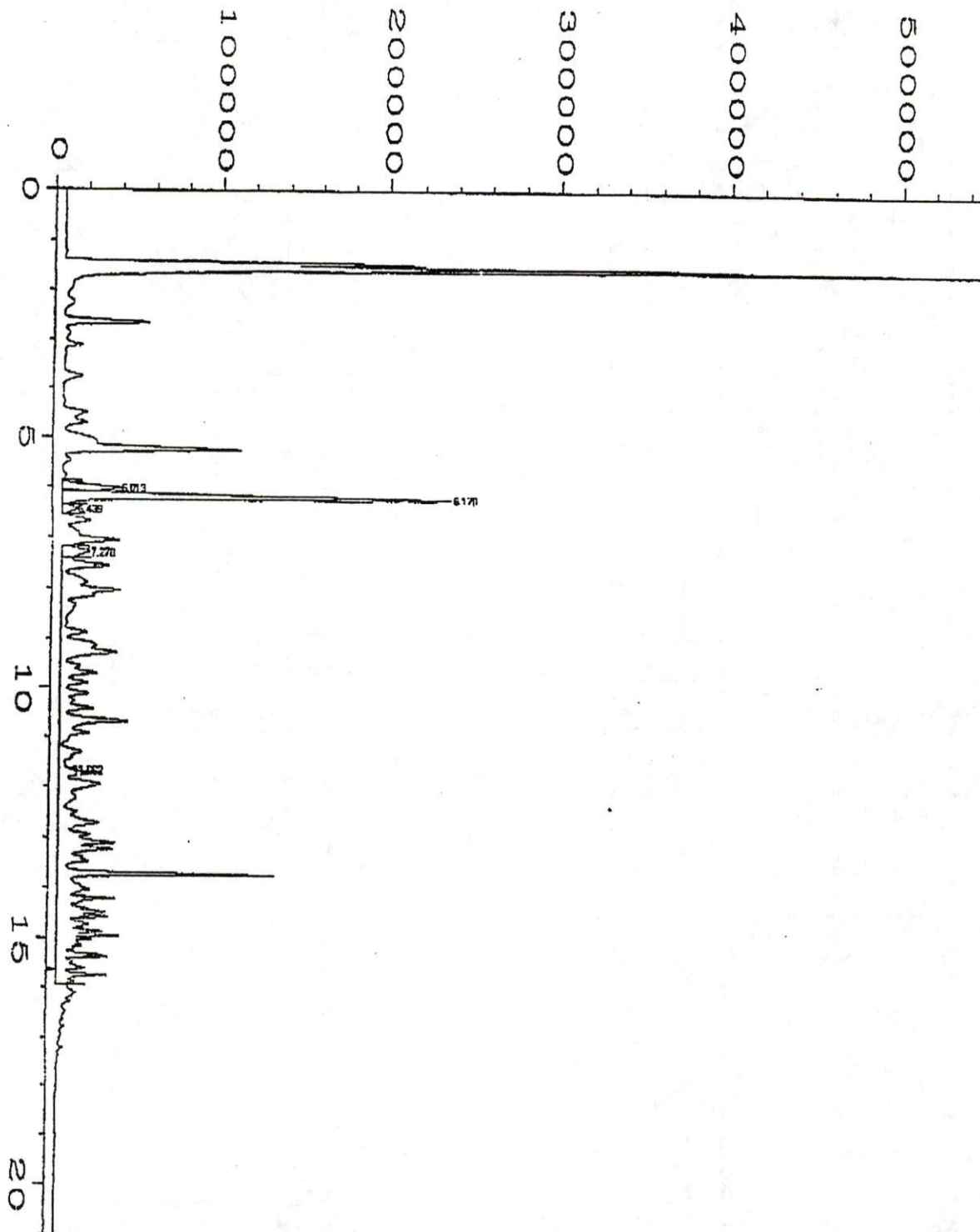
MATRIX : SOIL

UNITS : %

PARAMETER	ATI I.D.	SAMPLE RESULT	DUP RESULT	RPD	SPIKED RESULT	SPIKE ADDED	% REC
MOISTURE	9209-241-3	21	21	0	N/A	N/A	N/A

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative \% Difference)} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 100$$



1 Data File Name	: F:\DATA\FUELS\WATSON\D\920929\010R0101.D	Page Number	: 1
Operator	: FUELS	Vial Number	: 10
Instrument	: WATSON	Injection Number	: 1
Sample Name	: 209576-2 920922-62	Sequence Line	: 1
1 n Time Bar Code		Instrument Method	: TPHG.MTH
Acquired on	: 29 Sep 92 05:07 PM	Analysis Method	: WTPHG.MTH
Report Created on	: 30 Sep 92 02:39 PM	Sample Amount	: 0
st Recalib on	: 09 SEP 92 01:12 PM	ISTD Amount	:
ltiplier	: 1		

**GEOENGINEERS, INC.
8410 154TH AVENUE N.E.
REDMOND, WASHINGTON 98052
(206) 861-6000**

Geo  Engineers

9209-241

DATE 9/22/92
PAGE 1 OF 1
LAB
LAB NO. 9209-241

[illegible]



DATE 9/23 PAGE 1 OF 1

Chain of Custody LABORATORY NUMBER: 209576

PROJECT MANAGER: Donna McKinney

ANALYTICAL TECHNOLOGIES, INC.
560 NACHES AVE SW, SUITE 101
RENTON, WA 98055
(206) 228-8335

SAMPLE DISPOSAL INSTRUCTIONS

☒ AT1 Dispositif

Return

[illegible]

PROJECT INFORMATION		SAMPLE RECEIPT		RELINQUISHED BY: 1.		RELINQUISHED BY: 2.		RELINQUISHED BY: 3.	
ATI PROJ #: 9209-241	TOTAL NUMBER OF CONTAINERS	4		Signature:	Time:	Signature:	Time:	Signature:	Time:
ATI PROJ NAME: GEO	COC SEALS INTACT? Y/N	Y		Signature: [Signature]	Time: 11:00				
CLIENT PROJ: Chevron - B-train	RECEIVED GOOD COND./COLD	Y		Printed Name:	Date:	Printed Name:	Date:	Printed Name:	Date:
0372-080-R04	RECEIVED VIA: FEDEX			Signature: [Signature]	Date: 9/24/92				
SPECIAL INSTRUCTIONS:				Company:		Company:		Company:	
				RECEIVED BY: 1.		RECEIVED BY: 2.		RECEIVED BY: (LAB) 3.	
				Signature:	Time:	Signature:	Time:	Signature:	Time:
				Printed Name:	Date:	Printed Name:	Date:	Printed Name:	Date:
VERBALS DUE: 9/30				Signature: [Signature]	Time: 09:00				
HARDCOPY DUE: 10/16				Printed Name:	Date:	Printed Name:	Date:	Printed Name:	Date:
PRICE: _____ DISC: _____				Signature: [Signature]	Date: 9/24/92				
DIGESTION NEEDED?				Company: API		Company:		Analytical Technologies, Inc.	



Analytical**Technologies**, Inc.

560 Naches Avenue, S.W., Suite 101, Renton, WA 98055 (206) 228-8335

ATI I.D. # 9209-257

October 15, 1992

GeoEngineers

OCT 16 1992

Posting

KRE

GeoEngineers, Inc.
8410 154th Avenue N.E.
Redmond, WA 98052

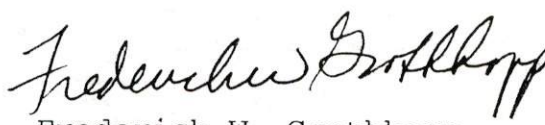
Attention : Kurt Fraese

Project Number : 0372-080-R04

Project Name : Chevron - Bellingham

On September 24, 1992, Analytical Technologies, Inc., received eight soil samples for analysis. The samples were analyzed with EPA methodology or equivalent methods as specified in the attached analytical schedule. The results, sample cross reference, and quality control data are enclosed.


Donna M. McKinney
Senior Project Manager


Frederick W. Grothkopp
Laboratory Manager

FWG/hal/ff

Analytical**Technologies**, Inc.

AMENDED

560 Naches Avenue, S.W., Suite 101, Renton, WA 98055 (206) 228-8335

ATI I.D. # 9209-257

SAMPLE CROSS REFERENCE SHEET

CLIENT : GEOENGINEERS, INC.
 PROJECT # : 0372-080-R04
 PROJECT NAME : CHEVRON - BELLINGHAM
 REVISED : 12/07/92

PI #	CLIENT DESCRIPTION	DATE SAMPLED	MATRIX
9209-257-1	920923-G5	09/23/92	SOIL
9209-257-2	920923-G6	09/23/92	SOIL
9209-257-3	920923-G7	09/23/92	SOIL
9209-257-4	920923-G8	09/23/92	SOIL
9209-257-5	920923-SS1	09/23/92	SOIL
9209-257-6	920923-SS2	09/23/92	SOIL
9209-257-7	920923-SS3	09/23/92	SOIL
9209-257-8	920923-SS4	09/23/92	SOIL

=====

----- TOTALS -----

MATRIX	# SAMPLES
SOIL	8

ATI STANDARD DISPOSAL PRACTICE

The samples from this project will be disposed of in thirty (30) days from the date of the report. If an extended storage period is required, please contact our sample control department before the scheduled disposal date.

ATI I.D. # 9209-257

ANALYTICAL SCHEDULE

CLIENT : GEOENGINEERS, INC.
PROJECT # : 0372-080-R04
PROJECT NAME : CHEVRON - BELLINGHAM

ANALYSIS	TECHNIQUE	REFERENCE	LAB
BETX	GC/PID	EPA 8020	PTL
TOTAL PETROLEUM HYDROCARBONS	GC/FID	WA DOE WTPH-G	PTL
MOISTURE	GRAVIMETRIC	CLP SOW ILM01.0	PTL

R = ATI - Renton
SD = ATI - San Diego
PHX = ATI - Phoenix
PTL = ATI - Portland
PNR = ATI - Pensacola
FC = ATI - Fort Collins
SUB = Subcontract



ATI I.D. # 9209-257

QUALITY CONTROL
INFORMATION

CLIENT : GEOENGINEERS, INC.
PROJECT # : 0372-080-R04
PROJECT NAME : CHEVRON - BELLINGHAM

BETX

DETECTION LIMITS

	WATER	SOIL
Benzene	0.0005 mg/L	0.025 mg/Kg
Toluene	0.0005 mg/L	0.025 mg/Kg
Ethyl Benzene	0.0005 mg/L	0.025 mg/Kg
Xylenes	0.0005 mg/L	0.025 mg/Kg

CONTROL LIMITS

BLANK SPIKE

	WATER	RPD	SOIL	RPD
Benzene	80-120	20	60-110	20
Ethylbenzene	80-120	20	70-120	20
Toluene	80-120	20	70-120	20
Xylenes	80-120	20	70-120	20

MATRIX SPIKE

	WATER	RPD	SOIL	RPD
Benzene	75-118	20	55-110	20
Ethylbenzene	70-120	20	80-110	20
Toluene	71-122	20	55-110	20
Xylenes	70-117	20	60-110	20

WA DOE WTPH-G

DETECTION LIMITS

	SOIL
Gasoline	5 mg/Kg

CONTROL LIMITS

BLANK SPIKE

	WATER	RPD	SOIL	RPD
Gasoline	80-120	20	80-120	20

MATRIX SPIKE

	WATER	RPD	SOIL	RPD
Gasoline	70-120	20	60-120	20

ATI I.D. # 9209-257

CASE NARRATIVE

CLIENT : GEOENGINEERS, INC.
PROJECT # : 0372-080-R04
PROJECT NAME : CHEVRON - BELLINGHAM

CASE NARRATIVE: VOLATILE ORGANICS (BETX) COMPOUNDS

Ten (10) grams of sample was extracted with methanol. 100 uls of the extract was added to five mls of water and analyzed using a gas chromatograph equipped with PID detector. Five point calibration curves were used for quantitation.

ATI accession 210506-1 was extracted on October 5, 1992, and analyzed on October 6, 1992. The results for benzene and ethylbenzene in the matrix spike and matrix spike duplicate (MS/MSD) were below the established control limits in the MSD. The blank spike and blank spike duplicate met criteria. The sample MS and MSD were reextracted and analyzed on October 8, 1992. All QC met criteria. Both sets of QC are reported.

ATI accession 210219-2, which was used as a matrix spike and matrix spike duplicate (MS/MSD) has a total xylene positive result of 6.4 mg/Kg. The amount spiked was insufficient to be quantitated against the background xylenes already in the soil sample. The matrix spike duplicate (MSD) recovery for total xylenes was 55% and was flagged with an "H". This is below the established control limit of 60%. The blank spike and blank spike duplicate (BS/BSD) for this extraction set met criteria and are also reported.

Due to a laboratory error, 9209-257-6 (920923-SS2) and 9209-257-7 (920923-SS3) were extracted and analyzed past the recommended 14 day hold time.

ATI I.D. # 9209-257

VOLATILE ORGANIC COMPOUNDS
DATA SUMMARY

CLIENT : GEOENGINEERS, INC.
PROJECT # : 0372-080-R04
PROJECT NAME : CHEVRON - BELLINGHAM
CLIENT I.D. : REAGENT BLANK
SAMPLE MATRIX : SOIL
EPA METHOD : 8020 (BETX)
RESULTS ARE CORRECTED FOR MOISTURE CONTENT

DATE SAMPLED : N/A
DATE RECEIVED : N/A
DATE EXTRACTED : 09/29/92
DATE ANALYZED : 09/30/92
UNITS : mg/Kg
DILUTION FACTOR : 1

COMPOUND	MDL	RESULT
BENZENE	0.025	ND
ETHYLBENZENE	0.025	ND
TOLUENE	0.025	ND
TOTAL XYLENES	0.025	ND

SURROGATE PERCENT RECOVERY

TRIFLUOROTOLUENE 94

ATI I.D. # 9209-257

VOLATILE ORGANIC COMPOUNDS
DATA SUMMARY

CLIENT	: GEOENGINEERS, INC.	DATE SAMPLED	: N/A
PROJECT #	: 0372-080-R04	DATE RECEIVED	: N/A
PROJECT NAME	: CHEVRON - BELLINGHAM	DATE EXTRACTED	: 10/05/92
CLIENT I.D.	: REAGENT BLANK	DATE ANALYZED	: 10/06/92
SAMPLE MATRIX	: SOIL	UNITS	: mg/Kg
EPA METHOD	: 8020 (BETX)	DILUTION FACTOR	: 1

RESULTS ARE CORRECTED FOR MOISTURE CONTENT

COMPOUND	MDL	RESULT
BENZENE	0.025	ND
ETHYLBENZENE	0.025	ND
TOLUENE	0.025	ND
TOTAL XYLENES	0.025	ND

SURROGATE PERCENT RECOVERY

TRIFLUOROTOLUENE	101
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ATI I.D. # 9209-257

VOLATILE ORGANIC COMPOUNDS
DATA SUMMARY

CLIENT : GEOENGINEERS, INC.
PROJECT # : 0372-080-R04
PROJECT NAME : CHEVRON - BELLINGHAM
CLIENT I.D. : REAGENT BLANK
SAMPLE MATRIX : SOIL
QA METHOD : 8020 (BETX)

DATE SAMPLED : N/A
DATE RECEIVED : N/A
DATE EXTRACTED : 10/09/92
DATE ANALYZED : 10/09/92
UNITS : mg/Kg
DILUTION FACTOR : 1

RESULTS ARE CORRECTED FOR MOISTURE CONTENT

COMPOUND	MDL	RESULT
BENZENE	0.025	ND
ETHYLBENZENE	0.025	ND
TOLUENE	0.025	ND
TOTAL XYLENES	0.025	ND

SURROGATE PERCENT RECOVERY

TRIFLUOROTOLUENE 95

AMENDED

ATI I.D. # 9209-257-1

VOLATILE ORGANIC COMPOUNDS
DATA SUMMARY

CLIENT	: GEOENGINEERS, INC.	DATE SAMPLED	: 09/23/92
PROJECT #	: 0372-080-R04	DATE RECEIVED	: 09/24/92
PROJECT NAME	: CHEVRON - BELLINGHAM	DATE EXTRACTED	: 09/29/92
CLIENT I.D.	: 920923-G5	DATE ANALYZED	: 09/29/92
SAMPLE MATRIX	: SOIL	UNITS	: mg/Kg
EPA METHOD	: 8020 (BETX)	DILUTION FACTOR	: 1
REVISED	: 12/07/92		

RESULTS ARE CORRECTED FOR MOISTURE CONTENT

COMPOUND	MDL	RESULT
BENZENE	0.028	ND
ETHYLBENZENE	0.028	ND
TOLUENE	0.028	ND
TOTAL XYLENES	0.028	ND

SURROGATE PERCENT RECOVERY

TRIFLUOROTOLUENE	87
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AMENDED

ATI I.D. # 9209-257-2

VOLATILE ORGANIC COMPOUNDS
DATA SUMMARY

CLIENT : GEOENGINEERS, INC. DATE SAMPLED : 09/23/92
PROJECT # : 0372-080-R04 DATE RECEIVED : 09/24/92
PROJECT NAME : CHEVRON - BELLINGHAM DATE EXTRACTED : 09/29/92
CLIENT I.D. : 920923-G6 DATE ANALYZED : 09/29/92
SAMPLE MATRIX : SOIL UNITS : mg/Kg
EPA METHOD : 8020 (BETX) DILUTION FACTOR : 1
REVISED : 12/07/92
RESULTS ARE CORRECTED FOR MOISTURE CONTENT

COMPOUND	MDL	RESULT
BENZENE	0.029	ND
ETHYLBENZENE	0.029	ND
TOLUENE	0.029	ND
TOTAL XYLENES	0.029	ND

SURROGATE PERCENT RECOVERY

TRIFLUOROTOLUENE 74

AMENDED

ATI I.D. # 9209-257-3

VOLATILE ORGANIC COMPOUNDS
DATA SUMMARY

CLIENT : GEOENGINEERS, INC.
PROJECT # : 0372-080-R04
PROJECT NAME : CHEVRON - BELLINGHAM
CLIENT I.D. : 920923-G7
SAMPLE MATRIX : SOIL
EPA METHOD : 8020 (BETX)
REVISED : 12/07/92

DATE SAMPLED : 09/23/92
DATE RECEIVED : 09/24/92
DATE EXTRACTED : 09/29/92
DATE ANALYZED : 09/29/92
UNITS : mg/Kg
DILUTION FACTOR : 1

RESULTS ARE CORRECTED FOR MOISTURE CONTENT

COMPOUND	MDL	RESULT
BENZENE	0.028	ND
ETHYLBENZENE	0.028	ND
TOLUENE	0.028	ND
TOTAL XYLENES	0.028	ND

SURROGATE PERCENT RECOVERY

TRIFLUOROTOLUENE

84

AMENDED

ATI I.D. # 9209-257-4

VOLATILE ORGANIC COMPOUNDS
DATA SUMMARY

CLIENT	: GEOENGINEERS, INC.	DATE SAMPLED	: 09/23/92
PROJECT #	: 0372-080-R04	DATE RECEIVED	: 09/24/92
PROJECT NAME	: CHEVRON - BELLINGHAM	DATE EXTRACTED	: 09/29/92
CLIENT I.D.	: 920923-G8	DATE ANALYZED	: 09/29/92
SAMPLE MATRIX	: SOIL	UNITS	: mg/Kg
PA METHOD	: 8020 (BETX)	DILUTION FACTOR	: 1
REVISED	: 12/07/92		

RESULTS ARE CORRECTED FOR MOISTURE CONTENT

COMPOUND	MDL	RESULT
ENZENE	0.029	ND
ETHYLBENZENE	0.029	ND
TOLUENE	0.029	ND
OTAL XYLENES	0.029	ND

SURROGATE PERCENT RECOVERY

TRIFLUOROTOLUENE	86
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AMENDED

ATI I.D. # 9209-257-7

VOLATILE ORGANIC COMPOUNDS
DATA SUMMARY

CLIENT	: GEOENGINEERS, INC.	DATE SAMPLED	: 09/23/92
PROJECT #	: 0372-080-R04	DATE RECEIVED	: 09/24/92
PROJECT NAME	: CHEVRON - BELLINGHAM	DATE EXTRACTED	: 10/09/92*
CLIENT I.D.	: 920923-SS3	DATE ANALYZED	: 10/09/92
SAMPLE MATRIX	: SOIL	UNITS	: mg/Kg
EPA METHOD	: 8020 (BETX)	DILUTION FACTOR	: 1
REVISED	: 12/07/92		
RESULTS ARE CORRECTED FOR MOISTURE CONTENT			

COMPOUND	MDL	RESULT
BENZENE	0.031	ND
ETHYLBENZENE	0.031	ND
TOLUENE	0.031	ND
TOTAL XYLENES	0.031	ND

SURROGATE PERCENT RECOVERY

TRIFLUOROTOLUENE	63
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* Extracted and analyzed past recommended hold time.

ATI I.D. # 9209-257-6

VOLATILE ORGANIC COMPOUNDS
DATA SUMMARY

CLIENT	: GEOENGINEERS, INC.	DATE SAMPLED	: 09/23/92
PROJECT #	: 0372-080-R04	DATE RECEIVED	: 09/24/92
PROJECT NAME	: CHEVRON - BELLINGHAM	DATE EXTRACTED	: 10/09/92*
CLIENT I.D.	: 920923-SS2	DATE ANALYZED	: 10/12/92
SAMPLE MATRIX	: SOIL	UNITS	: mg/Kg
PA METHOD	: 8020 (BETX)	DILUTION FACTOR	: 1

RESULTS ARE CORRECTED FOR MOISTURE CONTENT

COMPOUND	MDL	RESULT
BENZENE	0.032	ND
ETHYLBENZENE	0.032	ND
TOLUENE	0.032	0.036
TOTAL XYLENES	0.032	ND

SURROGATE PERCENT RECOVERY

1,1-DIFLUOROTOLUENE	58
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Extracted and analyzed past recommended hold time.

ATI I.D. # 9209-257-7

VOLATILE ORGANIC COMPOUNDS
DATA SUMMARY

CLIENT	: GEOENGINEERS, INC.	DATE SAMPLED	: 09/23/92
PROJECT #	: 0372-080-R04	DATE RECEIVED	: 09/24/92
PROJECT NAME	: CHEVRON - BELLINGHAM	DATE EXTRACTED	: 10/09/92*
CLIENT I.D.	: 920923-SS2	DATE ANALYZED	: 10/09/92
SAMPLE MATRIX	: SOIL	UNITS	: mg/Kg
EPA METHOD	: 8020 (BETX)	DILUTION FACTOR	: 1

RESULTS ARE CORRECTED FOR MOISTURE CONTENT

COMPOUND	MDL	RESULT
BENZENE	0.031	ND
ETHYLBENZENE	0.031	ND
TOLUENE	0.031	ND
TOTAL XYLENES	0.031	ND

SURROGATE PERCENT RECOVERY

TRIFLUOROTOLUENE	63
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* Extracted and analyzed past recommended hold time.

ATI I.D. # 9209-257-8

VOLATILE ORGANIC COMPOUNDS
DATA SUMMARY

CLIENT : GEOENGINEERS, INC.
PROJECT # : 0372-080-R04
PROJECT NAME : CHEVRON - BELLINGHAM
CLIENT I.D. : 920923-SS4
SAMPLE MATRIX : SOIL
EPA METHOD : 8020 (BETX)
RESULTS ARE CORRECTED FOR MOISTURE CONTENT

DATE SAMPLED : 09/23/92
DATE RECEIVED : 09/24/92
DATE EXTRACTED : 10/05/92
DATE ANALYZED : 10/06/92
UNITS : mg/Kg
DILUTION FACTOR : 1

COMPOUND	MDL	RESULT
BENZENE	0.032	ND
ETHYLBENZENE	0.032	ND
TOLUENE	0.032	ND
TOTAL XYLENES	0.032	ND

SURROGATE PERCENT RECOVERY

1,1-DIFLUOROTOLUENE 72

ATI I.D. # 9209-257

VOLATILE ORGANIC COMPOUNDS
QUALITY CONTROL DATA

CLIENT : GEOENGINEERS, INC.	SAMPLE I.D. : 9209-257-1
PROJECT # : 0372-080-R04	DATE EXTRACTED : 09/29/92
PROJECT NAME : CHEVRON - BELLINGHAM	DATE ANALYZED : 09/29/92
EPA METHOD : 8020 (BETX)	MATRIX : SOIL
RESULTS ARE CORRECTED FOR MOISTURE CONTENT UNITS : mg/Kg	

COMPOUND	SAMPLE RESULT	SPIKE ADDED	SPIKED SAMPLE	% REC	DUP SPIKED SAMPLE	DUP % REC	RPD
BENZENE	ND	1.12	1.15	103	1.16	104	1
ETHYLBENZENE	ND	1.12	1.13	101	1.13	101	0
TOLUENE	ND	1.12	1.11	99	1.11	99	0
TOTAL XYLENES	ND	2.25	2.20	98	2.20	98	0

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative \% Difference)} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 100$$

ATI I.D. # 9209-257

VOLATILE ORGANIC COMPOUNDS
QUALITY CONTROL DATA

CLIENT : GEOENGINEERS, INC.	SAMPLE I.D. : 210506-1
PROJECT # : 0372-080-R04	DATE EXTRACTED : 10/05/92
PROJECT NAME : CHEVRON - BELLINGHAM	DATE ANALYZED : 10/06/92
EPA METHOD : 8020 (BETX)	MATRIX : SOIL
RESULTS ARE CORRECTED FOR MOISTURE CONTENT UNITS	: mg/Kg

COMPOUND	SAMPLE RESULT	SPIKE ADDED	SPIKED SAMPLE	% REC	DUP SPIKED SAMPLE	DUP % REC	RPD
BENZENE	ND	1.22	0.65	53H	0.50	41H	26
ETHYLBENZENE	ND	1.22	0.72	59	0.57	47H	23
TOLUENE	ND	1.22	0.69	57H	0.54	44H	24
TOTAL XYLENES	ND	2.44	1.56	64	1.28	52H	20

= Out of limits.

$$\text{Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative \% Difference)} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 100$$

ATI I.D. # 9209-257

VOLATILE ORGANIC COMPOUNDS
QUALITY CONTROL DATA

CLIENT : GEOENGINEERS, INC.	SAMPLE I.D. : 210506-1
PROJECT # : 0372-080-R04	DATE EXTRACTED : 10/08/92
PROJECT NAME : CHEVRON - BELLINGHAM	DATE ANALYZED : 10/08/92
EPA METHOD : 8020 (BETX)	MATRIX : SOIL
RESULTS ARE CORRECTED FOR MOISTURE CONTENT UNITS	: mg/Kg

COMPOUND	SAMPLE RESULT	SPIKE ADDED	SPIKED SAMPLE	% REC	DUP SPIKED SAMPLE	DUP % REC	RPD
BENZENE	ND	1.22	0.84	69	0.88	72	5
ETHYLBENZENE	ND	1.22	0.92	75	0.97	80	5
TOLUENE	ND	1.22	0.90	74	0.95	78	5
TOTAL XYLENES	ND	2.44	1.96	80	2.06	84	5

H = Out of limits.

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative \% Difference)} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 100$$

ATI I.D. # 9209-257

VOLATILE ORGANIC COMPOUNDS
QUALITY CONTROL DATA

CLIENT : GEOENGINEERS, INC.	SAMPLE I.D. : 210519-2
PROJECT # : 0372-080-R04	DATE EXTRACTED : 10/09/92
PROJECT NAME : CHEVRON - BELLINGHAM	DATE ANALYZED : 10/12/92
EPA METHOD : 8020 (BETX)	MATRIX : SOIL
RESULTS ARE CORRECTED FOR MOISTURE CONTENT UNITS : mg/Kg	

COMPOUND	SAMPLE RESULT	SPIKE ADDED	SPIKED SAMPLE	% REC	DUP SPIKED SAMPLE	DUP % REC	RPD
BENZENE	0.17	1.00	0.86	69	0.84	67	2
ETHYLBENZENE	3.8	1.00	4.6	80	4.4	60	4
TOLUENE	0.18	1.00	0.92	74	0.91	73	1
TOTAL XYLENES	6.4	2.00	7.8	70	7.5	55H	4

H = Out of limits.

$$\text{Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative \% Difference)} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 100$$

ATI I.D. # 9209-257

VOLATILE ORGANIC COMPOUNDS
QUALITY CONTROL DATA

CLIENT : GEOENGINEERS, INC.	SAMPLE I.D. : BLANK SPIKE
PROJECT # : 0372-080-R04	DATE EXTRACTED : 10/05/92
PROJECT NAME : CHEVRON - BELLINGHAM	DATE ANALYZED : 10/05/92
EPA METHOD : 8020 (BETX)	MATRIX : SOIL
RESULTS ARE CORRECTED FOR MOISTURE CONTENT	UNITS : mg/Kg

COMPOUND	SAMPLE RESULT	SPIKE ADDED	SPIKED SAMPLE	% REC	DUP SPIKED SAMPLE	DUP % REC	RPD
BENZENE	ND	1.00	0.91	91	0.93	93	2
ETHYLBENZENE	ND	1.00	1.07	107	1.08	108	1
TOLUENE	ND	1.00	1.03	103	1.04	104	1
TOTAL XYLENES	ND	2.00	2.20	110	2.22	111	1

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative \% Difference)} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 100$$

ATI I.D. # 9209-257

VOLATILE ORGANIC COMPOUNDS
QUALITY CONTROL DATA

CLIENT : GEOENGINEERS, INC. SAMPLE I.D. : BLANK SPIKE
PROJECT # : 0372-080-R04 DATE EXTRACTED : 10/09/92
PROJECT NAME : CHEVRON - BELLINGHAM DATE ANALYZED : 10/09/92
EPA METHOD : 8020 (BETX) MATRIX : SOIL
RESULTS ARE CORRECTED FOR MOISTURE CONTENT UNITS : mg/Kg

COMPOUND	SAMPLE RESULT	SPIKE ADDED	SPIKED SAMPLE	% REC	DUP SPIKED SAMPLE	DUP % REC	RPD
BENZENE	ND	1.00	0.93	93	0.92	92	1
ETHYLBENZENE	ND	1.00	0.97	97	0.97	97	0
TOLUENE	ND	1.00	0.98	98	0.97	97	1
TOTAL XYLENES	ND	2.00	2.00	100	1.97	99	2

$$\text{Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RD (Relative \% Difference)} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 100$$

ATI I.D. # 9209-257

TOTAL PETROLEUM HYDROCARBON ANALYSIS
DATA SUMMARY

CLIENT : GEOENGINEERS, INC.
PROJECT # : 0372-080-R04
PROJECT NAME : CHEVRON - BELLINGHAM
CLIENT I.D. : REAGENT BLANK
SAMPLE MATRIX : SOIL
METHOD : WA DOE WTPH-G
RESULTS ARE CORRECTED FOR MOISTURE CONTENT

DATE SAMPLED : N/A
DATE RECEIVED : N/A
DATE EXTRACTED : 09/29/92
DATE ANALYZED : 09/29/92
UNITS : mg/Kg
DILUTION FACTOR : 1

COMPOUND	MDL	RESULT
FUEL HYDROCARBONS	5.0	ND
HYDROCARBON RANGE		TOLUENE TO DODECANE
HYDROCARBON QUANTITATION USING		GASOLINE

SURROGATE PERCENT RECOVERY

TRIFLUOROTOLUENE	99
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ATI I.D. # 9209-257

TOTAL PETROLEUM HYDROCARBON ANALYSIS
DATA SUMMARY

CLIENT	: GEOENGINEERS, INC.	DATE SAMPLED	: N/A
PROJECT #	: 0372-080-R04	DATE RECEIVED	: N/A
PROJECT NAME	: CHEVRON - BELLINGHAM	DATE EXTRACTED	: 09/29/92
CLIENT I.D.	: REAGENT BLANK	DATE ANALYZED	: 09/29/92
SAMPLE MATRIX	: SOIL	UNITS	: mg/Kg
METHOD	: WA DOE WTPH-G	DILUTION FACTOR	: 1

RESULTS ARE CORRECTED FOR MOISTURE CONTENT

COMPOUND	MDL	RESULT
HEAVY HYDROCARBONS	5.0	ND
HYDROCARBON RANGE		TOLUENE TO DODECANE
HYDROCARBON QUANTITATION USING		GASOLINE

SURROGATE PERCENT RECOVERY

TRIFLUOROTOLUENE	95
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AMENDED

ATI I.D. # 9209-257-1

TOTAL PETROLEUM HYDROCARBON ANALYSIS
DATA SUMMARY

CLIENT	: GEOENGINEERS, INC.	DATE SAMPLED	: 09/23/92
PROJECT #	: 0372-080-R04	DATE RECEIVED	: 09/24/92
PROJECT NAME	: CHEVRON - BELLINGHAM	DATE EXTRACTED	: 09/29/92
CLIENT I.D.	: 920923-G5	DATE ANALYZED	: 09/29/92
SAMPLE MATRIX	: SOIL	UNITS	: mg/Kg
METHOD	: WA DOE WTPH-G	DILUTION FACTOR	: 1
REVISED	: 12/07/92		

RESULTS ARE CORRECTED FOR MOISTURE CONTENT

COMPOUND	MDL	RESULT
FUEL HYDROCARBONS	5.6	ND
HYDROCARBON RANGE		TOLUENE TO DODECANE
HYDROCARBON QUANTITATION USING		GASOLINE

SURROGATE PERCENT RECOVERY

TRIFLUOROTOLUENE	71
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AMENDED

ATI I.D. # 9209-257-1

TOTAL PETROLEUM HYDROCARBON ANALYSIS
DATA SUMMARY

CLIENT : GEOENGINEERS, INC.
PROJECT # : 0372-080-R04
PROJECT NAME : CHEVRON - BELLINGHAM
CLIENT I.D. : 920923-G6
SAMPLE MATRIX : SOIL
METHOD : WA DOE WTPH-G
REVISED : 12/07/92

DATE SAMPLED : 09/23/92
DATE RECEIVED : 09/24/92
DATE EXTRACTED : 09/29/92
DATE ANALYZED : 09/29/92
UNITS : mg/Kg
DILUTION FACTOR : 1

RESULTS ARE CORRECTED FOR MOISTURE CONTENT

COMPOUND	MDL	RESULT
JEL HYDROCARBONS	5.8	ND
HYDROCARBON RANGE		TOLUENE TO DODECANE
HYDROCARBON QUANTITATION USING		GASOLINE

SURROGATE PERCENT RECOVERY

TRIFLUOROTOLUENE	60
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ATI I.D. # 9209-257-3

TOTAL PETROLEUM HYDROCARBON ANALYSIS
DATA SUMMARY

CLIENT	: GEOENGINEERS, INC.	DATE SAMPLED	: 09/23/92
PROJECT #	: 0372-080-R04	DATE RECEIVED	: 09/24/92
PROJECT NAME	: CHEVRON - BELLINGHAM	DATE EXTRACTED	: 09/29/92
CLIENT I.D.	: 920923-G7	DATE ANALYZED	: 09/29/92
SAMPLE MATRIX	: SOIL	UNITS	: mg/Kg
METHOD	: WA DOE WTPH-G	DILUTION FACTOR	: 1
REVISED	: 12/07/92		
RESULTS ARE CORRECTED FOR MOISTURE CONTENT			

COMPOUND	MDL	RESULT
FUEL HYDROCARBONS	5.6	ND
HYDROCARBON RANGE		TOLUENE TO DODECANE
HYDROCARBON QUANTITATION USING		GASOLINE

SURROGATE PERCENT RECOVERY

TRIFLUOROTOLUENE	69
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ATI I.D. # 9209-257-4

TOTAL PETROLEUM HYDROCARBON ANALYSIS
DATA SUMMARY

CLIENT : GEOENGINEERS, INC.
PROJECT # : 0372-080-R04
PROJECT NAME : CHEVRON - BELLINGHAM
CLIENT I.D. : 920923-G8
SAMPLE MATRIX : SOIL
METHOD : WA DOE WTPH-G
REVISED : 12/07/92
RESULTS ARE CORRECTED FOR MOISTURE CONTENT

DATE SAMPLED : 09/23/92
DATE RECEIVED : 09/24/92
DATE EXTRACTED : 09/29/92
DATE ANALYZED : 09/29/92
UNITS : mg/Kg
DILUTION FACTOR : 1

COMPOUND	MDL	RESULT
HEAVY HYDROCARBONS	5.7	ND
HYDROCARBON RANGE		TOLUENE TO DODECANE
HYDROCARBON QUANTITATION USING		GASOLINE

SURROGATE PERCENT RECOVERY

TRIFLUOROTOLUENE 63

ATI I.D. # 9209-257-5

TOTAL PETROLEUM HYDROCARBON ANALYSIS
DATA SUMMARY

CLIENT	: GEOENGINEERS, INC.	DATE SAMPLED	: 09/23/92
PROJECT #	: 0372-080-R04	DATE RECEIVED	: 09/24/92
PROJECT NAME	: CHEVRON - BELLINGHAM	DATE EXTRACTED	: 09/29/92
CLIENT I.D.	: 920923-SS1	DATE ANALYZED	: 09/29/92
SAMPLE MATRIX	: SOIL	UNITS	: mg/Kg
METHOD	: WA DOE WTPH-G	DILUTION FACTOR	: 1
RESULTS ARE CORRECTED FOR MOISTURE CONTENT			

COMPOUND	MDL	RESULT
FUEL HYDROCARBONS	6.4	ND
HYDROCARBON RANGE		TOLUENE TO DODECANE
HYDROCARBON QUANTITATION USING		GASOLINE

SURROGATE PERCENT RECOVERY

TRIFLUOROTOLUENE	65
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ATI I.D. # 9209-257-6

TOTAL PETROLEUM HYDROCARBON ANALYSIS
DATA SUMMARY

CLIENT	: GEOENGINEERS, INC.	DATE SAMPLED	: 09/23/92
PROJECT #	: 0372-080-R04	DATE RECEIVED	: 09/24/92
PROJECT NAME	: CHEVRON - BELLINGHAM	DATE EXTRACTED	: 09/29/92
CLIENT I.D.	: 920923-SS2	DATE ANALYZED	: 09/29/92
SAMPLE MATRIX	: SOIL	UNITS	: mg/Kg
METHOD	: WA DOE WTPH-G	DILUTION FACTOR	: 1

RESULTS ARE CORRECTED FOR MOISTURE CONTENT

COMPOUND	MDL	RESULT
UEL HYDROCARBONS	6.4	ND
YDROCARBON RANGE		TOLUENE TO DODECANE
HYDROCARBON QUANTITATION USING		GASOLINE

SURROGATE PERCENT RECOVERY

TRIFLUOROTOLUENE	70
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ATI I.D. # 9209-257-7

TOTAL PETROLEUM HYDROCARBON ANALYSIS
DATA SUMMARY

CLIENT : GEOENGINEERS, INC.
PROJECT # : 0372-080-R04
PROJECT NAME : CHEVRON - BELLINGHAM
CLIENT I.D. : 920923-SS3
SAMPLE MATRIX : SOIL
METHOD : WA DOE WTPH-G
RESULTS ARE CORRECTED FOR MOISTURE CONTENT

DATE SAMPLED : 09/23/92
DATE RECEIVED : 09/24/92
DATE EXTRACTED : 09/29/92
DATE ANALYZED : 09/29/92
UNITS : mg/Kg
DILUTION FACTOR : 1

COMPOUND	MDL	RESULT
FUEL HYDROCARBONS	6.3	ND
HYDROCARBON RANGE		TOLUENE TO DODECANE
HYDROCARBON QUANTITATION USING		GASOLINE

SURROGATE PERCENT RECOVERY

TRIFLUOROTOLUENE 67

ATI I.D. # 9209-257-8

TOTAL PETROLEUM HYDROCARBON ANALYSIS
DATA SUMMARY

CLIENT	: GEOENGINEERS, INC.	DATE SAMPLED	: 09/23/92
PROJECT #	: 0372-080-R04	DATE RECEIVED	: 09/24/92
PROJECT NAME	: CHEVRON - BELLINGHAM	DATE EXTRACTED	: 09/29/92
CLIENT I.D.	: 920923-SS4	DATE ANALYZED	: 09/29/92
SAMPLE MATRIX	: SOIL	UNITS	: mg/Kg
METHOD	: WA DOE WTPH-G	DILUTION FACTOR	: 1

RESULTS ARE CORRECTED FOR MOISTURE CONTENT

COMPOUND	MDL	RESULT
HEAVY HYDROCARBONS	5.7	ND
HYDROCARBON RANGE		TOLUENE TO DODECANE
HYDROCARBON QUANTITATION USING		GASOLINE

SURROGATE PERCENT RECOVERY

1,1-DIFLUOROTOLUENE	67
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ATI I.D. # 9209-257

TOTAL PETROLEUM HYDROCARBON ANALYSIS
QUALITY CONTROL DATA

CLIENT : GEOENGINEERS, INC. SAMPLE I.D. # : 9209-257-7
PROJECT # : 0372-080-R04 DATE EXTRACTED : 09/29/92
PROJECT NAME : CHEVRON - BELLINGHAM DATE ANALYZED : 09/29/92
METHOD : WA DOE WTPH-G UNITS : mg/Kg
SAMPLE MATRIX : SOIL
RESULTS ARE CORRECTED FOR MOISTURE CONTENT

COMPOUND	SAMPLE		RPD	SPIKE ADDED	SPIKED RESULT	% REC.	DUP.	DUP.	RPD
	SAMPLE RESULT	DUP. RESULT					SPIKED RESULT	% REC.	
PETROLEUM HYDROCARBONS (GASOLINE)	ND	ND	NC	N/A	N/A	N/A	N/A	N/A	N/A

NC = Not Calculable.

$$\% \text{ Recovery} = \frac{(\text{Spiked Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative \% Difference)} = \frac{|(\text{Spike Result} - \text{Dup. Spike Result})|}{\text{Average Result}} \times 100$$

ATI I.D. # 9209-257

TOTAL PETROLEUM HYDROCARBON ANALYSIS
QUALITY CONTROL DATA

CLIENT : GEOENGINEERS, INC. SAMPLE I.D. # : 9209-257-1
 ROJECT # : 0372-080-R04 DATE EXTRACTED : 09/29/92
 ROJECT NAME : CHEVRON - BELLINGHAM DATE ANALYZED : 09/29/92
 METHOD : WA DOE WTPH-G UNITS : mg/Kg
 ^AMPLE MATRIX : SOIL
 ESULTS ARE CORRECTED FOR MOISTURE CONTENT

COMPOUND	SAMPLE RESULT	SPIKE ADDED	SPIKED RESULT	% REC.	DUP. SPIKED RESULT	DUP. % REC.	RPD
PETROLEUM HYDROCARBONS (GASOLINE)	ND	112	117	104	116	103	1

$$\text{Recovery} = \frac{(\text{Spiked Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{PD (Relative \% Difference)} = \frac{|(\text{Spike Result} - \text{Dup. Spike Result})|}{\text{Average Result}} \times 100$$

ATI I.D. # 9209-257

TOTAL PETROLEUM HYDROCARBON ANALYSIS
QUALITY CONTROL DATA

CLIENT : GEOENGINEERS, INC. SAMPLE I.D. # : BLANK SPIKE
 PROJECT # : 0372-080-R04 DATE EXTRACTED : 09/29/92
 PROJECT NAME : CHEVRON - BELLINGHAM DATE ANALYZED : 09/29/92
 METHOD : WA DOE WTPH-G UNITS : mg/Kg
 SAMPLE MATRIX : SOIL
 RESULTS ARE CORRECTED FOR MOISTURE CONTENT

COMPOUND	SAMPLE RESULT	SPIKE ADDED	SPIKED RESULT	% REC.	DUP. SPIKED RESULT	DUP. % REC.	RPD
PETROLEUM HYDROCARBONS (GASOLINE)	ND	100	110	110	111	111	1

$$\% \text{ Recovery} = \frac{(\text{Spiked Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative \% Difference)} = \frac{|(\text{Spike Result} - \text{Dup. Spike Result})|}{\text{Average Result}} \times 100$$



ATI I.D. # 9209-257

GENERAL CHEMISTRY ANALYSIS

CLIENT : GEOENGINEERS, INC.
OBJECT # : 0372-080-R04
OBJECT NAME : CHEVRON - BELLINGHAM

MATRIX : SOIL

PARAMETER

DATE ANALYZED

1. HUMIDITY

10/01/92

ATI I.D. # 9209-257

GENERAL CHEMISTRY ANALYSIS
QUALITY CONTROL DATA

CLIENT : GEOENGINEERS, INC.
PROJECT # : 0372-080-R04
PROJECT NAME : CHEVRON - BELLINGHAM

MATRIX : SOIL

UNITS : %

PARAMETER	ATI I.D.	SAMPLE RESULT	DUP RESULT	RPD	SPIKED RESULT	SPIKE ADDED	% REC
MOISTURE	9209-257-1	11	11	0	N/A	N/A	N/A

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative \% Difference)} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 100$$

CHAIN OF CUSTODY RECORD

GEOENGINEERS, INC.
8410 154TH AVENUE N.E.
REDMOND, WASHINGTON 98052
(206) 861-6000



DATE 9/23/92
PAGE 1 OF 1
LAB
LAB NO. 9209-257

PROJECT NAME/LOCATION <u>Chevron Bellingham</u>						ANALYSIS REQUIRED												NOTES/COMMENTS
PROJECT NUMBER <u>372-080-R4</u>																		(Preserved, filtered, etc.)
PROJECT MANAGER <u>Kurt Fraese</u>																		
SAMPLED BY <u>DAVE KING</u>																		
SAMPLE IDENTIFICATION		SAMPLE COLLECTION			# OF JARS	BETA 8020	WTPH-6											
LAB	GEOENGINEERS	DATE	TIME	MATRIX														
-1	920923-65	9/23/92	905	S	1	X	X											
-2	920923-66		930		2	X	X											
-3	920923-67		1100		2	X	X											
-4	920923-68		1535		2	X	X											
-5	920923-SS1		1450		1	X	X											
-6	920923-SS2		1452		1	X	X											
-7	920923-SS3		1455		1	X	X											
-8	920923-SS4		1500		1	X	X											

* Run BETA only if
* less than 100 ppm
* Same
* Same
* Same

RELINQUISHED BY SIGNATURE <u>Dave King</u> PRINTED NAME <u>DAVE KING</u> DATE <u>9/23/92</u> TIME <u>1440</u>	FIRM <u>GET</u>	RELINQUISHED BY SIGNATURE PRINTED NAME DATE TIME	FIRM	RELINQUISHED BY SIGNATURE PRINTED NAME DATE TIME	FIRM
RECEIVED BY SIGNATURE <u>Stina</u> PRINTED NAME <u>STINA KEUSLER</u> DATE <u>9/24/92</u> TIME <u>9:30</u>	FIRM	RECEIVED BY SIGNATURE PRINTED NAME DATE TIME	FIRM	RECEIVED BY SIGNATURE PRINTED NAME DATE TIME	FIRM

ADDITIONAL COMMENTS: If possible no more than 1 week T.A.T for WTPH-6



Analytical Technologies, Inc.

560 Naches Avenue SW, Suite 101 Renton, WA 98055 (206)228-8335

TO PENSACOLA, FL PLD

DATE 9/24 PAGE 1 OF 1

Chain of Custody

LABORATORY NUMBER: 209579

PROJECT MANAGER: Donna McKinney

ANALYTICAL TECHNOLOGIES, INC.
560 NACHES AVE SW, SUITE 101
RENTON, WA 98055
(206) 228-8335

SAMPLE DISPOSAL INSTRUCTIONS

☒ ATI Disposal☐ Return

SAMPLE ID	DATE	TIME	MATRIX	LAB ID	824	827	831	808	PCB	815	TOC	TOX	BOD	COD	CYA	MB	NIT	PP	EPT	TCL	TCL	TCL	TCL	TCL	PH	%	W	W	R		
9209-257-1	9/23/02		SOIL	-1																							X	X			1
-2				-2																							X	X			2
-3				-3																							X	X			2
-4				-4																							X	X			2
-5				-5																							X		X		1
-6				-6																							X	X	X		1
-7				-7																							X	X	X		1
-8				-8																							X	X	X		1

PROJECT INFORMATION		SAMPLE RECEIPT		RELINQUISHED BY: 1.		RELINQUISHED BY: 2.		RELINQUISHED BY: 3.	
ATI PROJ #: 9209-257		TOTAL NUMBER OF CONTAINERS 11		Signature: [Signature] Time: 10:00		Signature: [Signature] Time: [Time]		Signature: [Signature] Time: [Time]	
ATI PROJ NAME: GEO		COC SEALS/INTACT? Y/N/NA Y		Printed Name: [Signature] Date: 9/24/02		Printed Name: [Signature] Date: [Date]		Printed Name: [Signature] Date: [Date]	
CLIENT PROJ: Chevron B-ham		RECEIVED GOOD COND./COLD Y		Company: ATENA		Company: [Company]		Company: [Company]	
0372-080-R04		RECEIVED VIA: FedEx 930a		RECEIVED BY: 1.		RECEIVED BY: 2.		RECEIVED BY: (LAB) 3.	
SPECIAL INSTRUCTIONS: VERBALS DUE: 10/1/02 noon HARDCOPY DUE: 10/1 PRICE: _____ DISC: _____ DIGESTION NEEDED?				Signature: [Signature] Time: 10:30a		Signature: [Signature] Time: [Time]		Signature: [Signature] Time: [Time]	
				Printed Name: ANDI MCNEIL Date: 9/25/02		Printed Name: [Signature] Date: [Date]		Printed Name: [Signature] Date: [Date]	
				Company: ATI		Company: [Company]		Analytical Technologies, Inc.	



Analytical**Technologies**, Inc.

560 Naches Avenue, S.W., Suite 101, Renton, WA 98055 (206) 228-8335

ATI I.D. # 9209-275

October 9, 1992

GeoEngineers

OCT 12 1992

Routing

File

GeoEngineers, Inc.
8410 154th Avenue N.E.
Redmond, WA 98052

Attention : Kurt Fraese

Project Number : 0372-080-R04

Project Name : Chevron/Bellingham

On September 25, 1992, Analytical Technologies, Inc., received ten soil samples for analysis. The samples were analyzed with EPA methodology or equivalent methods as specified in the attached analytical schedule. The results, sample cross reference, and quality control data are enclosed.


Donna M. McKinney
Senior Project Manager


Frederick W. Grothkopp
Laboratory Manager

FWG/hal/ff



ATI I.D. # 9209-275

SAMPLE CROSS REFERENCE SHEET

CLIENT : GEOENGINEERS, INC.
PROJECT # : 0372-080-R04
PROJECT NAME : CHEVRON/BELLINGHAM

ATI #	CLIENT DESCRIPTION	DATE SAMPLED	MATRIX
9209-275-1	920924-G9	09/24/92	SOIL
9209-275-2	920924-G10	09/24/92	SOIL
9209-275-3	920924-G11	09/24/92	SOIL
9209-275-4	920924-G12	09/24/92	SOIL
9209-275-5	920924-SS2-1	09/24/92	SOIL
9209-275-6	920924-SS2-2	09/24/92	SOIL
9209-275-7	920924-SS2-3	09/24/92	SOIL
9209-275-8	920924-SS2-4	09/24/92	SOIL
9209-275-9	920924-SS2-5	09/24/92	SOIL
9209-275-10	920924-SS2-6	09/24/92	SOIL

----- TOTALS -----

MATRIX	# SAMPLES
SOIL	10

ATI STANDARD DISPOSAL PRACTICE

The samples from this project will be disposed of in thirty (30) days from the date of the report. If an extended storage period is required, please contact our sample control department before the scheduled disposal date.

ATI I.D. # 9209-275

ANALYTICAL SCHEDULE

CLIENT : GEOENGINEERS, INC.
PROJECT # : 0372-080-R04
PROJECT NAME : CHEVRON/BELLINGHAM

ANALYSIS	TECHNIQUE	REFERENCE	LAB
BETX	GC/PID	EPA 8020	R
TOTAL PETROLEUM HYDROCARBONS	GC/FID	WA DOE WTPH-G	R
MOISTURE	GRAVIMETRIC	CLP SOW ILMO1.0	R

R = ATI - Renton
SD = ATI - San Diego
PHX = ATI - Phoenix
PNR = ATI - Pensacola
FC = ATI - Fort Collins
SUB = Subcontract

ATI I.D. # 9209-275

QUALITY CONTROL
INFORMATION

CLIENT : GEOENGINEERS, INC.
PROJECT # : 0372-080-R04
PROJECT NAME : CHEVRON/BELLINGHAM

BETX

DETECTION LIMITS

	WATER	SOIL
Benzene	0.0005 mg/L	0.025 mg/Kg
Toluene	0.0005 mg/L	0.025 mg/Kg
Ethyl Benzene	0.0005 mg/L	0.025 mg/Kg
Xylenes	0.0005 mg/L	0.025 mg/Kg

CONTROL LIMITS

	WATER	RPD	SOIL	RPD
BLANK SPIKE				
Benzene	82-114	20	65-111	20
Toluene	81-116	20	70-119	20
Xylenes	75-120	20	72-119	20
MATRIX SPIKE				
Benzene	75-112	20	50-97	20
Toluene	71-122	20	53-105	20
Xylenes	70-117	20	60-105	20

WA DOE WTPH-G

DETECTION LIMITS

	SOIL
Gasoline	5 mg/Kg

CONTROL LIMITS

	SOIL	RPD
BLANK SPIKE		
Gasoline	86-114	20
MATRIX SPIKE		
Gasoline	59-107	20



ATI I.D. # 9209-275

VOLATILE ORGANIC COMPOUNDS
DATA SUMMARY

CLIENT : GEOENGINEERS, INC.
PROJECT # : 0372-080-R04
PROJECT NAME : CHEVRON/BELLINGHAM
CLIENT I.D. : REAGENT BLANK
SAMPLE MATRIX : SOIL
EPA METHOD : 8020 (BETX)
RESULTS ARE CORRECTED FOR MOISTURE CONTENT

DATE SAMPLED : N/A
DATE RECEIVED : N/A
DATE EXTRACTED : 09/28/92
DATE ANALYZED : 10/03/92
UNITS : mg/Kg
DILUTION FACTOR : 1

COMPOUND	MDL	RESULT
BENZENE	0.025	ND
ETHYLBENZENE	0.025	ND
TOLUENE	0.025	ND
TOTAL XYLENES	0.025	ND

SURROGATE PERCENT RECOVERY

BROMOFLUOROBENZENE 92



ATI I.D. # 9209-275-1

VOLATILE ORGANIC COMPOUNDS
DATA SUMMARY

CLIENT	: GEOENGINEERS, INC.	DATE SAMPLED	: 09/24/92
PROJECT #	: 0372-080-R04	DATE RECEIVED	: 09/25/92
PROJECT NAME	: CHEVRON/BELLINGHAM	DATE EXTRACTED	: 09/28/92
CLIENT I.D.	: 920924-G9	DATE ANALYZED	: 10/01/92
SAMPLE MATRIX	: SOIL	UNITS	: mg/Kg
EPA METHOD	: 8020 (BETX)	DILUTION FACTOR	: 1
RESULTS ARE CORRECTED FOR MOISTURE CONTENT			

COMPOUND	MDL	RESULT
BENZENE	0.031	ND
ETHYLBENZENE	0.031	ND
TOLUENE	0.031	ND
TOTAL XYLENES	0.031	ND

SURROGATE PERCENT RECOVERY

BROMOFLUOROBENZENE	89
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ATI I.D. # 9209-275-2

VOLATILE ORGANIC COMPOUNDS
DATA SUMMARY

CLIENT : GEOENGINEERS, INC.
PROJECT # : 0372-080-R04
PROJECT NAME : CHEVRON/BELLINGHAM
CLIENT I.D. : 920924-G10
SAMPLE MATRIX : SOIL
EPA METHOD : 8020 (BETX)
RESULTS ARE CORRECTED FOR MOISTURE CONTENT

DATE SAMPLED : 09/24/92
DATE RECEIVED : 09/25/92
DATE EXTRACTED : 09/28/92
DATE ANALYZED : 10/01/92
UNITS : mg/Kg
DILUTION FACTOR : 1

COMPOUND	MDL	RESULT
BENZENE	0.028	ND
ETHYLBENZENE	0.028	ND
TOLUENE	0.028	ND
TOTAL XYLENES	0.028	ND

SURROGATE PERCENT RECOVERY

BROMOFLUOROBENZENE 86

ATI I.D. # 9209-275-3

VOLATILE ORGANIC COMPOUNDS
DATA SUMMARY

CLIENT	: GEOENGINEERS, INC.	DATE SAMPLED	: 09/24/92
PROJECT #	: 0372-080-R04	DATE RECEIVED	: 09/25/92
PROJECT NAME	: CHEVRON/BELLINGHAM	DATE EXTRACTED	: 09/28/92
CLIENT I.D.	: 920924-G11	DATE ANALYZED	: 10/01/92
SAMPLE MATRIX	: SOIL	UNITS	: mg/Kg
EPA METHOD	: 8020 (BETX)	DILUTION FACTOR	: 1
RESULTS ARE CORRECTED FOR MOISTURE CONTENT			

COMPOUND	MDL	RESULT
BENZENE	0.030	ND
ETHYLBENZENE	0.030	1.4
TOLUENE	0.030	ND
TOTAL XYLENES	0.030	3.3

SURROGATE PERCENT RECOVERY

BROMOFLUOROBENZENE	100
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ATI I.D. # 9209-275-4

VOLATILE ORGANIC COMPOUNDS
DATA SUMMARY

CLIENT : GEOENGINEERS, INC.
PROJECT # : 0372-080-R04
PROJECT NAME : CHEVRON/BELLINGHAM
CLIENT I.D. : 920924-G12
SAMPLE MATRIX : SOIL
EPA METHOD : 8020 (BETX)
RESULTS ARE CORRECTED FOR MOISTURE CONTENT

DATE SAMPLED : 09/24/92
DATE RECEIVED : 09/25/92
DATE EXTRACTED : 09/28/92
DATE ANALYZED : 10/01/92
UNITS : mg/Kg
DILUTION FACTOR : 1

COMPOUND	MDL	RESULT
BENZENE	0.028	ND
ETHYLBENZENE	0.028	ND
TOLUENE	0.028	ND
TOTAL XYLENES	0.028	ND

SURROGATE PERCENT RECOVERY

BROMOFLUOROBENZENE

83

ATI I.D. # 9209-275-5

VOLATILE ORGANIC COMPOUNDS
DATA SUMMARY

CLIENT	: GEOENGINEERS, INC.	DATE SAMPLED	: 09/24/92
PROJECT #	: 0372-080-R04	DATE RECEIVED	: 09/25/92
PROJECT NAME	: CHEVRON/BELLINGHAM	DATE EXTRACTED	: 09/28/92
CLIENT I.D.	: 920924-SS2-1	DATE ANALYZED	: 10/01/92
SAMPLE MATRIX	: SOIL	UNITS	: mg/Kg
EPA METHOD	: 8020 (BETX)	DILUTION FACTOR	: 1

RESULTS ARE CORRECTED FOR MOISTURE CONTENT

COMPOUND	MDL	RESULT
BENZENE	0.028	ND
ETHYLBENZENE	0.028	0.14
TOLUENE	0.028	0.031
TOTAL XYLENES	0.028	0.31

SURROGATE PERCENT RECOVERY

BROMOFLUOROBENZENE	89
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ATI I.D. # 9209-275-6

VOLATILE ORGANIC COMPOUNDS
DATA SUMMARY

CLIENT : GEOENGINEERS, INC.
PROJECT # : 0372-080-R04
PROJECT NAME : CHEVRON/BELLINGHAM
CLIENT I.D. : 920924-SS2-2
SAMPLE MATRIX : SOIL
EPA METHOD : 8020 (BETX)
RESULTS ARE CORRECTED FOR MOISTURE CONTENT

DATE SAMPLED : 09/24/92
DATE RECEIVED : 09/25/92
DATE EXTRACTED : 09/28/92
DATE ANALYZED : 10/01/92
UNITS : mg/Kg
DILUTION FACTOR : 1

COMPOUND	MDL	RESULT
BENZENE	0.028	ND
ETHYLBENZENE	0.028	0.074
TOLUENE	0.028	ND
TOTAL XYLENES	0.028	0.15

SURROGATE PERCENT RECOVERY

BROMOFLUOROBENZENE

88



ATI I.D. # 9209-275-7

VOLATILE ORGANIC COMPOUNDS
DATA SUMMARY

CLIENT	: GEOENGINEERS, INC.	DATE SAMPLED	: 09/24/92
PROJECT #	: 0372-080-R04	DATE RECEIVED	: 09/25/92
PROJECT NAME	: CHEVRON/BELLINGHAM	DATE EXTRACTED	: 09/28/92
CLIENT I.D.	: 920924-SS2-3	DATE ANALYZED	: 10/01/92
SAMPLE MATRIX	: SOIL	UNITS	: mg/Kg
EPA METHOD	: 8020 (BETX)	DILUTION FACTOR	: 1

RESULTS ARE CORRECTED FOR MOISTURE CONTENT

COMPOUND	MDL	RESULT
BENZENE	0.030	ND
ETHYLBENZENE	0.030	ND
TOLUENE	0.030	ND
TOTAL XYLENES	0.030	0.038

SURROGATE PERCENT RECOVERY

BROMOFLUOROBENZENE	86
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ATI I.D. # 9209-275-8

VOLATILE ORGANIC COMPOUNDS
DATA SUMMARY

CLIENT : GEOENGINEERS, INC.
PROJECT # : 0372-080-R04
PROJECT NAME : CHEVRON/BELLINGHAM
CLIENT I.D. : 920924-SS2-4
SAMPLE MATRIX : SOIL
EPA METHOD : 8020 (BETX)
RESULTS ARE CORRECTED FOR MOISTURE CONTENT

DATE SAMPLED : 09/24/92
DATE RECEIVED : 09/25/92
DATE EXTRACTED : 09/28/92
DATE ANALYZED : 09/30/92
UNITS : mg/Kg
DILUTION FACTOR : 1

COMPOUND	MDL	RESULT
BENZENE	0.029	ND
ETHYLBENZENE	0.029	ND
TOLUENE	0.029	ND
TOTAL XYLENES	0.029	ND

SURROGATE PERCENT RECOVERY

BROMOFLUOROBENZENE

90

ATI I.D. # 9209-275-9

VOLATILE ORGANIC COMPOUNDS
DATA SUMMARY

CLIENT	: GEOENGINEERS, INC.	DATE SAMPLED	: 09/24/92
PROJECT #	: 0372-080-R04	DATE RECEIVED	: 09/25/92
PROJECT NAME	: CHEVRON/BELLINGHAM	DATE EXTRACTED	: 09/28/92
CLIENT I.D.	: 920924-SS2-5	DATE ANALYZED	: 09/30/92
SAMPLE MATRIX	: SOIL	UNITS	: mg/Kg
EPA METHOD	: 8020 (BETX)	DILUTION FACTOR	: 1
RESULTS ARE CORRECTED FOR MOISTURE CONTENT			

COMPOUND	MDL	RESULT
BENZENE	0.032	ND
ETHYLBENZENE	0.032	0.28
TOLUENE	0.032	0.15
TOTAL XYLENES	0.032	0.89

SURROGATE PERCENT RECOVERY

BROMOFLUOROBENZENE	111
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ATI I.D. # 9209-275-10

VOLATILE ORGANIC COMPOUNDS
DATA SUMMARY

CLIENT	: GEOENGINEERS, INC.	DATE SAMPLED	: 09/24/92
PROJECT #	: 0372-080-R04	DATE RECEIVED	: 09/25/92
PROJECT NAME	: CHEVRON/BELLINGHAM	DATE EXTRACTED	: 09/28/92
CLIENT I.D.	: 920924-SS2-6	DATE ANALYZED	: 09/30/92
SAMPLE MATRIX	: SOIL	UNITS	: mg/Kg
EPA METHOD	: 8020 (BETX)	DILUTION FACTOR	: 1

RESULTS ARE CORRECTED FOR MOISTURE CONTENT

COMPOUND	MDL	RESULT
BENZENE	0.031	ND
ETHYLBENZENE	0.031	1.2
TOLUENE	0.031	0.35
TOTAL XYLENES	0.031	5.4

SURROGATE PERCENT RECOVERY

BROMOFLUOROBENZENE	106
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ATI I.D. # 9209-275

VOLATILE ORGANIC COMPOUNDS
QUALITY CONTROL DATA

CLIENT : GEOENGINEERS, INC.
PROJECT # : 0372-080-R04
PROJECT NAME : CHEVRON/BELLINGHAM
EPA METHOD : 8020 (BETX)

SAMPLE I.D. : 9209-275-1
DATE EXTRACTED : 09/28/92
DATE ANALYZED : 10/01/92
MATRIX : SOIL
UNITS : mg/Kg

COMPOUND	SAMPLE RESULT	SPIKE ADDED	SPIKED SAMPLE	% REC	DUP SPIKED SAMPLE	DUP % REC	RPD
BENZENE	ND	1.00	0.832	83	0.857	86	3
TOLUENE	ND	1.00	0.861	86	0.917	92	6
TOTAL XYLENES	ND	2.00	1.72	86	1.82	91	6

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative \% Difference)} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 100$$

ATI I.D. # 9209-275

VOLATILE ORGANIC COMPOUNDS
QUALITY CONTROL DATA

CLIENT : GEOENGINEERS, INC.
PROJECT # : 0372-080-R04
PROJECT NAME : CHEVRON/BELLINGHAM
EPA METHOD : 8020 (BETX)

SAMPLE I.D. : BLANK SPIKE
DATE EXTRACTED : 09/28/92
DATE ANALYZED : 10/03/92
MATRIX : SOIL
UNITS : mg/Kg

COMPOUND	SAMPLE RESULT	SPIKE ADDED	SPIKED SAMPLE	% REC	DUP SPIKED SAMPLE	DUP % REC	RPD
BENZENE	ND	1.00	0.945	95	0.926	93	2
TOLUENE	ND	1.00	0.981	98	0.955	96	3
TOTAL XYLENES	ND	2.00	1.90	95	1.84	92	3

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative \% Difference)} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 100$$



ATI I.D. # 9209-275

TOTAL PETROLEUM HYDROCARBON ANALYSIS
DATA SUMMARY

CLIENT	: GEOENGINEERS, INC.	DATE SAMPLED	: N/A
PROJECT #	: 0372-080-R04	DATE RECEIVED	: N/A
PROJECT NAME	: CHEVRON/BELLINGHAM	DATE EXTRACTED	: 09/28/92
CLIENT I.D.	: REAGENT BLANK	DATE ANALYZED	: 09/30/92
SAMPLE MATRIX	: SOIL	UNITS	: mg/Kg
METHOD	: WA DOE WTPH-G	DILUTION FACTOR	: 1

RESULTS ARE CORRECTED FOR MOISTURE CONTENT

COMPOUND	MDL	RESULT
FUEL HYDROCARBONS	5	ND
HYDROCARBON RANGE		TOLUENE TO DODECANE
HYDROCARBON QUANTITATION USING		GASOLINE

SURROGATE PERCENT RECOVERY

TRIFLUOROTOLUENE	90
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ATI I.D. # 9209-275-1

TOTAL PETROLEUM HYDROCARBON ANALYSIS
DATA SUMMARY

CLIENT : GEOENGINEERS, INC.
PROJECT # : 0372-080-R04
PROJECT NAME : CHEVRON/BELLINGHAM
CLIENT I.D. : 920924-G9
SAMPLE MATRIX : SOIL
METHOD : WA DOE WTPH-G

DATE SAMPLED : 09/24/92
DATE RECEIVED : 09/25/92
DATE EXTRACTED : 09/28/92
DATE ANALYZED : 10/01/92
UNITS : mg/Kg
DILUTION FACTOR : 1

RESULTS ARE CORRECTED FOR MOISTURE CONTENT

COMPOUND	MDL	RESULT
FUEL HYDROCARBONS	6	ND
HYDROCARBON RANGE		TOLUENE TO DODECANE
HYDROCARBON QUANTITATION USING		GASOLINE

SURROGATE PERCENT RECOVERY

TRIFLUOROTOLUENE	87
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ATI I.D. # 9209-275-2

TOTAL PETROLEUM HYDROCARBON ANALYSIS
DATA SUMMARY

CLIENT : GEOENGINEERS, INC.
PROJECT # : 0372-080-R04
PROJECT NAME : CHEVRON/BELLINGHAM
CLIENT I.D. : 920924-G10
SAMPLE MATRIX : SOIL
METHOD : WA DOE WTPH-G
RESULTS ARE CORRECTED FOR MOISTURE CONTENT

DATE SAMPLED : 09/24/92
DATE RECEIVED : 09/25/92
DATE EXTRACTED : 09/28/92
DATE ANALYZED : 10/01/92
UNITS : mg/Kg
DILUTION FACTOR : 1

COMPOUND	MDL	RESULT
FUEL HYDROCARBONS	6	ND
HYDROCARBON RANGE		TOLUENE TO DODECANE
HYDROCARBON QUANTITATION USING		GASOLINE

SURROGATE PERCENT RECOVERY

TRIFLUOROTOLUENE	85
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ATI I.D. # 9209-275-3

TOTAL PETROLEUM HYDROCARBON ANALYSIS
DATA SUMMARY

CLIENT : GEOENGINEERS, INC.
PROJECT # : 0372-080-R04
PROJECT NAME : CHEVRON/BELLINGHAM
CLIENT I.D. : 920924-G11
SAMPLE MATRIX : SOIL
METHOD : WA DOE WTPH-G

DATE SAMPLED : 09/24/92
DATE RECEIVED : 09/25/92
DATE EXTRACTED : 09/28/92
DATE ANALYZED : 10/04/92
UNITS : mg/Kg
DILUTION FACTOR : 10

RESULTS ARE CORRECTED FOR MOISTURE CONTENT

COMPOUND	MDL	RESULT
FUEL HYDROCARBONS	60	650
HYDROCARBON RANGE		TOLUENE TO DODECANE
HYDROCARBON QUANTITATION USING		GASOLINE

SURROGATE PERCENT RECOVERY

TRIFLUOROTOLUENE	80
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ATI I.D. # 9209-275-4

TOTAL PETROLEUM HYDROCARBON ANALYSIS
DATA SUMMARY

CLIENT : GEOENGINEERS, INC.
PROJECT # : 0372-080-R04
PROJECT NAME : CHEVRON/BELLINGHAM
CLIENT I.D. : 920924-G12
SAMPLE MATRIX : SOIL
METHOD : WA DOE WTPH-G

DATE SAMPLED : 09/24/92
DATE RECEIVED : 09/25/92
DATE EXTRACTED : 09/28/92
DATE ANALYZED : 10/04/92
UNITS : mg/Kg
DILUTION FACTOR : 1

RESULTS ARE CORRECTED FOR MOISTURE CONTENT

COMPOUND	MDL	RESULT
FUEL HYDROCARBONS	6	ND
HYDROCARBON RANGE		TOLUENE TO DODECANE
HYDROCARBON QUANTITATION USING		GASOLINE

SURROGATE PERCENT RECOVERY

TRIFLUOROTOLUENE	84
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ATI I.D. # 9209-275-5

TOTAL PETROLEUM HYDROCARBON ANALYSIS
DATA SUMMARY

CLIENT	: GEOENGINEERS, INC.	DATE SAMPLED	: 09/24/92
PROJECT #	: 0372-080-R04	DATE RECEIVED	: 09/25/92
PROJECT NAME	: CHEVRON/BELLINGHAM	DATE EXTRACTED	: 09/28/92
CLIENT I.D.	: 920924-SS2-1	DATE ANALYZED	: 10/01/92
SAMPLE MATRIX	: SOIL	UNITS	: mg/Kg
METHOD	: WA DOE WTPH-G	DILUTION FACTOR	: 1
RESULTS ARE CORRECTED FOR MOISTURE CONTENT			

COMPOUND	MDL	RESULT
FUEL HYDROCARBONS	6	72
HYDROCARBON RANGE		TOLUENE TO DODECANE
HYDROCARBON QUANTITATION USING		GASOLINE

SURROGATE PERCENT RECOVERY

TRIFLUOROTOLUENE	87
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ATI I.D. # 9209-275-6

TOTAL PETROLEUM HYDROCARBON ANALYSIS
DATA SUMMARY

CLIENT	: GEOENGINEERS, INC.	DATE SAMPLED	: 09/24/92
PROJECT #	: 0372-080-R04	DATE RECEIVED	: 09/25/92
PROJECT NAME	: CHEVRON/BELLINGHAM	DATE EXTRACTED	: 09/28/92
CLIENT I.D.	: 920924-SS2-2	DATE ANALYZED	: 10/01/92
SAMPLE MATRIX	: SOIL	UNITS	: mg/Kg
METHOD	: WA DOE WTPH-G	DILUTION FACTOR	: 1

RESULTS ARE CORRECTED FOR MOISTURE CONTENT

COMPOUND	MDL	RESULT
FUEL HYDROCARBONS	6	45
HYDROCARBON RANGE		TOLUENE TO DODECANE
HYDROCARBON QUANTITATION USING		GASOLINE

SURROGATE PERCENT RECOVERY

TRIFLUOROTOLUENE	69
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ATI I.D. # 9209-275-7

TOTAL PETROLEUM HYDROCARBON ANALYSIS
DATA SUMMARY

CLIENT : GEOENGINEERS, INC.
PROJECT # : 0372-080-R04
PROJECT NAME : CHEVRON/BELLINGHAM
CLIENT I.D. : 920924-SS2-3
SAMPLE MATRIX : SOIL
METHOD : WA DOE WTPH-G

DATE SAMPLED : 09/24/92
DATE RECEIVED : 09/25/92
DATE EXTRACTED : 09/28/92
DATE ANALYZED : 10/01/92
UNITS : mg/Kg
DILUTION FACTOR : 1

RESULTS ARE CORRECTED FOR MOISTURE CONTENT

COMPOUND	MDL	RESULT
FUEL HYDROCARBONS	6	19
HYDROCARBON RANGE		TOLUENE TO DODECANE
HYDROCARBON QUANTITATION USING		GASOLINE

SURROGATE PERCENT RECOVERY

TRIFLUOROTOLUENE	87
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ATI I.D. # 9209-275-8

TOTAL PETROLEUM HYDROCARBON ANALYSIS
DATA SUMMARY

CLIENT : GEOENGINEERS, INC.
PROJECT # : 0372-080-R04
PROJECT NAME : CHEVRON/BELLINGHAM
CLIENT I.D. : 920924-SS2-4
SAMPLE MATRIX : SOIL
METHOD : WA DOE WTPH-G
RESULTS ARE CORRECTED FOR MOISTURE CONTENT

DATE SAMPLED : 09/24/92
DATE RECEIVED : 09/25/92
DATE EXTRACTED : 09/28/92
DATE ANALYZED : 09/30/92
UNITS : mg/Kg
DILUTION FACTOR : 1

COMPOUND	MDL	RESULT
FUEL HYDROCARBONS	6	6
HYDROCARBON RANGE		TOLUENE TO DODECANE
HYDROCARBON QUANTITATION USING		GASOLINE

SURROGATE PERCENT RECOVERY

TRIFLUOROTOLUENE	84
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ATI I.D. # 9209-275-9

TOTAL PETROLEUM HYDROCARBON ANALYSIS
DATA SUMMARY

CLIENT : GEOENGINEERS, INC.
PROJECT # : 0372-080-R04
PROJECT NAME : CHEVRON/BELLINGHAM
CLIENT I.D. : 920924-SS2-5
SAMPLE MATRIX : SOIL
METHOD : WA DOE WTPH-G
RESULTS ARE CORRECTED FOR MOISTURE CONTENT

DATE SAMPLED : 09/24/92
DATE RECEIVED : 09/25/92
DATE EXTRACTED : 09/28/92
DATE ANALYZED : 09/30/92
UNITS : mg/Kg
DILUTION FACTOR : 1

COMPOUND	MDL	RESULT
FUEL HYDROCARBONS	6	210
HYDROCARBON RANGE		TOLUENE TO DODECANE
HYDROCARBON QUANTITATION USING		GASOLINE

SURROGATE PERCENT RECOVERY

TRIFLUOROTOLUENE 81



ATI I.D. # 9209-275-10

TOTAL PETROLEUM HYDROCARBON ANALYSIS
DATA SUMMARY

CLIENT : GEOENGINEERS, INC.
PROJECT # : 0372-080-R04
PROJECT NAME : CHEVRON/BELLINGHAM
CLIENT I.D. : 920924-SS2-6
SAMPLE MATRIX : SOIL
METHOD : WA DOE WTPH-G
RESULTS ARE CORRECTED FOR MOISTURE CONTENT

DATE SAMPLED : 09/24/92
DATE RECEIVED : 09/25/92
DATE EXTRACTED : 09/28/92
DATE ANALYZED : 09/30/92
UNITS : mg/Kg
DILUTION FACTOR : 1

COMPOUND	MDL	RESULT
FUEL HYDROCARBONS	6	260
HYDROCARBON RANGE		TOLUENE TO DODECANE
HYDROCARBON QUANTITATION USING		GASOLINE

SURROGATE PERCENT RECOVERY

TRIFLUOROTOLUENE	85
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ATI I.D. # 9209-275

TOTAL PETROLEUM HYDROCARBON ANALYSIS
QUALITY CONTROL DATA

CLIENT : GEOENGINEERS, INC.
PROJECT # : 0372-080-R04
PROJECT NAME : CHEVRON/BELLINGHAM
METHOD : WA DOE WTPH-G
SAMPLE MATRIX : SOIL

SAMPLE I.D. # : 9209-275-1
DATE EXTRACTED : 09/28/92
DATE ANALYZED : 10/01/92
UNITS : mg/Kg

COMPOUND	SAMPLE RESULT	SAMPLE DUP.		SPIKE ADDED	SPIKED RESULT	% REC.	DUP. SPIKED		RPD
		RESULT	RPD				RESULT	%	
PETROLEUM HYDROCARBONS (GASOLINE)	ND	ND	NC	100	90.7	91	85.9	86	5

NC = Not Calculable.

$$\% \text{ Recovery} = \frac{(\text{Spiked Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative \% Difference)} = \frac{|(\text{Spike Result} - \text{Dup. Spike Result})|}{\text{Average Result}} \times 100$$

ATI I.D. # 9209-275

TOTAL PETROLEUM HYDROCARBON ANALYSIS
QUALITY CONTROL DATA

CLIENT : GEOENGINEERS, INC.
PROJECT # : 0372-080-R04
PROJECT NAME : CHEVRON/BELLINGHAM
METHOD : WA DOE WTPH-G
SAMPLE MATRIX : SOIL

SAMPLE I.D. # : BLANK SPIKE
DATE EXTRACTED : 09/28/92
DATE ANALYZED : 09/30/92
UNITS : mg/Kg

COMPOUND	SAMPLE RESULT	SPIKE ADDED	SPIKED RESULT	% REC.	DUP. SPIKED RESULT	DUP. % REC.	RPD
PETROLEUM HYDROCARBONS (GASOLINE)	ND	100	91.9	92	101	101	9

$$\% \text{ Recovery} = \frac{(\text{Spiked Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative \% Difference)} = \frac{|(\text{Spike Result} - \text{Dup. Spike Result})|}{\text{Average Result}} \times 100$$



ATI I.D. # 9209-275

GENERAL CHEMISTRY ANALYSIS

CLIENT : GEOENGINEERS, INC.
PROJECT # : 0372-080-R04
PROJECT NAME : CHEVRON/BELLINGHAM

MATRIX : SOIL

PARAMETER DATE ANALYZED

MOISTURE (SAMPLES -8, -9
-10) 09/28/92

MOISTURE (SAMPLES -1
THROUGH -3, -5 THROUGH
-7) 09/29/92

MOISTURE (SAMPLE -4) 09/30/92

ATI I.D. # 9209-275

GENERAL CHEMISTRY ANALYSIS
DATA SUMMARY

CLIENT : GEOENGINEERS, INC.
PROJECT # : 0372-080-R04
PROJECT NAME : CHEVRON/BELLINGHAM

MATRIX : SOIL

UNITS : %

ATI I.D. #	CLIENT I.D.	MDL	MOISTURE
9209-275-1	920924-G9	0.5	19
9209-275-2	920924-G10	0.5	12
9209-275-3	920924-G11	0.5	16
9209-275-4	920924-G12	0.5	12
9209-275-5	920924-SS2-1	0.5	11
9209-275-6	920924-SS2-2	0.5	10
9209-275-7	920924-SS2-3	0.5	17
9209-275-8	920924-SS2-4	0.5	15
9209-275-9	920924-SS2-5	0.5	22
9209-275-10	920924-SS2-6	0.5	19

ATI I.D. # 9209-275

GENERAL CHEMISTRY ANALYSIS
QUALITY CONTROL DATA

CLIENT : GEOENGINEERS, INC.
PROJECT # : 0372-080-R04
PROJECT NAME : CHEVRON/BELLINGHAM

MATRIX : SOIL

UNITS : %

PARAMETER	ATI I.D.	SAMPLE RESULT	DUP RESULT	RPD	SPIKED RESULT	SPIKE ADDED	% REC
MOISTURE	9209-275-4	12	12	0	N/A	N/A	N/A
MOISTURE	9209-275-8	15	15	0	N/A	N/A	N/A
MOISTURE	9209-293-7	23	23	0	N/A	N/A	N/A

$$\text{Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{PD (Relative \% Difference)} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 100$$

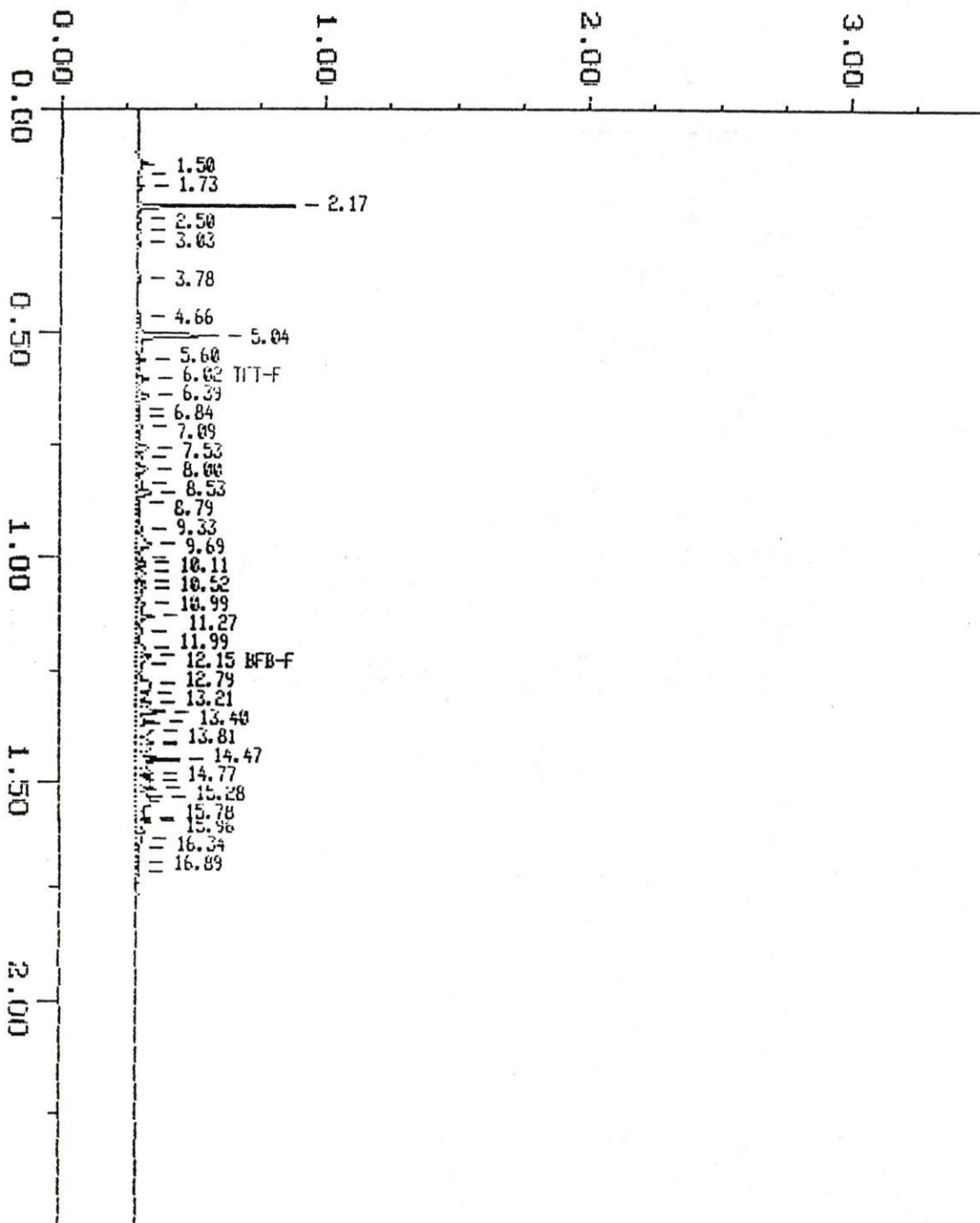
WTPHG

Sample: 9209-275-3 DIL
Acquired: 04-OCT-92 14:14
Dilution: 1 : 10.000

Channel: FID
Method: H:\BRO2\MSX\DATA\BALZAC\10040292

Filename: 10040204
Operator: BUB

$\times 10^{-1}$ volts



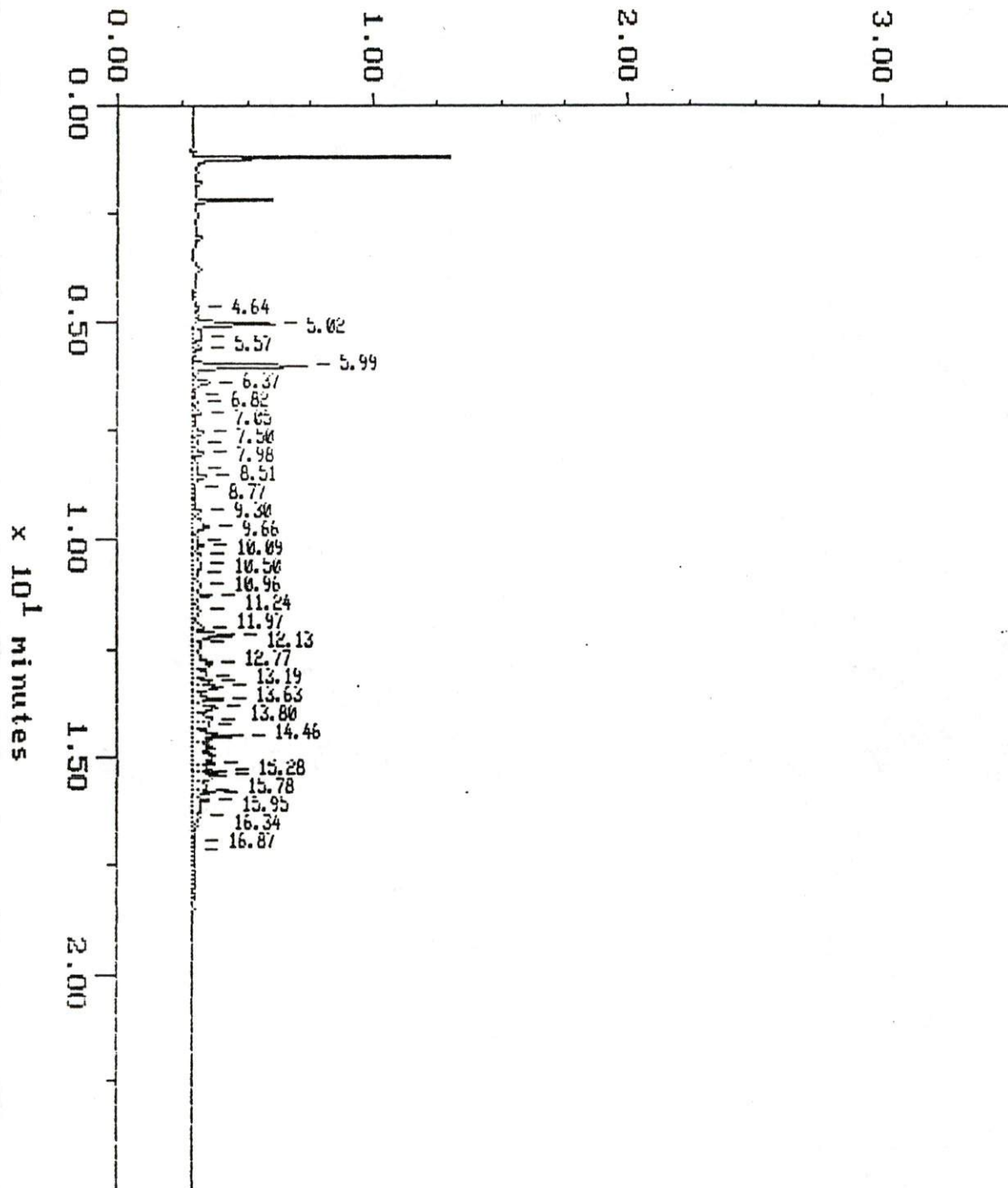
WTPHG

Sample: 9209-2/5-5
Acquired: 01-OCT-92 4:25

Channel: FID
Method: H:\BRU2\MAXDATA\BALZAC\09308Z92

Filename: 09308Z34
Operator: BOB

$\times 10^{-1}$ volts

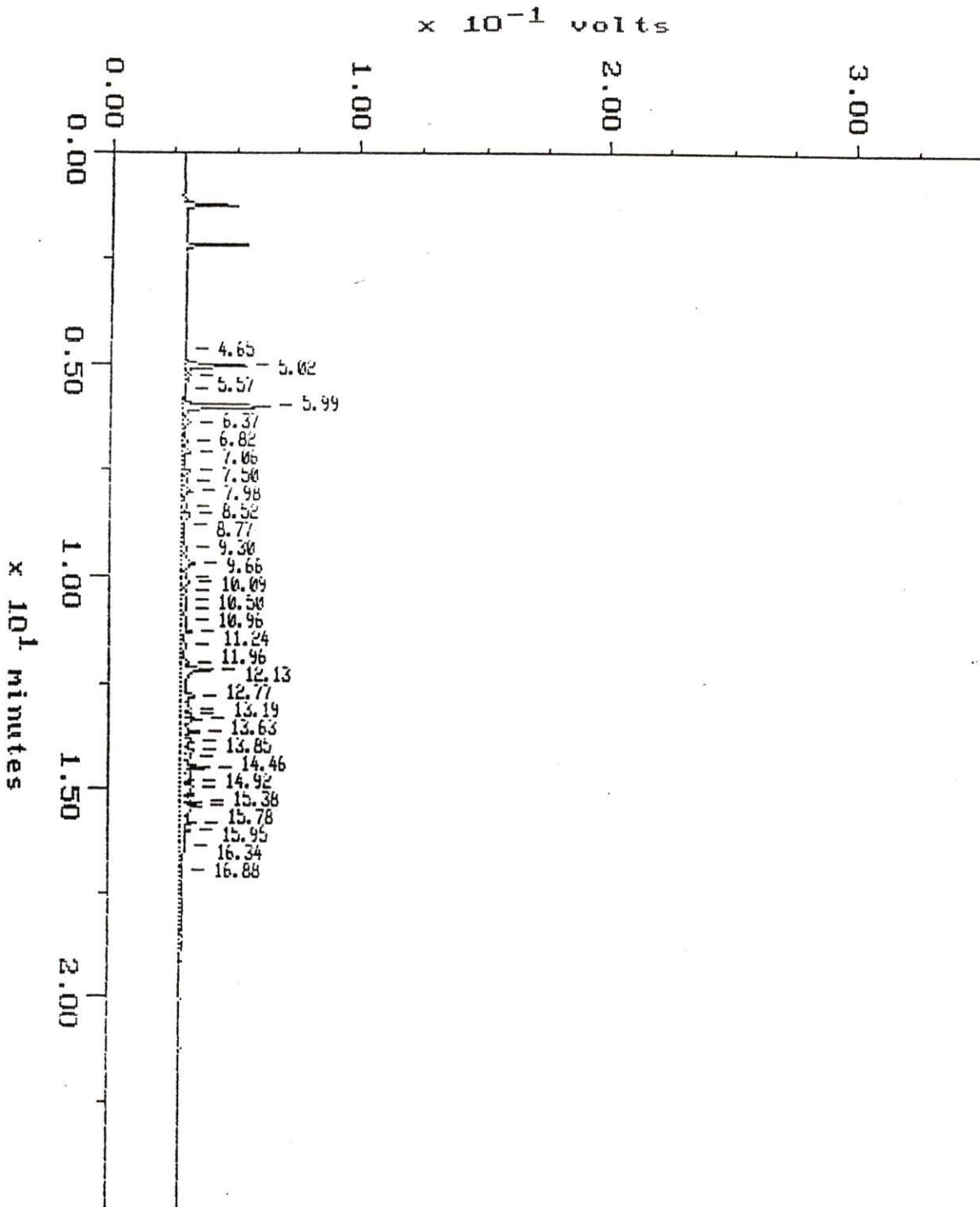


WTPH6

Sample: 9209-275-6
Acquired: 01-UCF-92 4:53

Channel: F10
Method: H:\BRU2\MAXDATA\BALZAC\09308292

Filename: 09308235
Operator: BOB

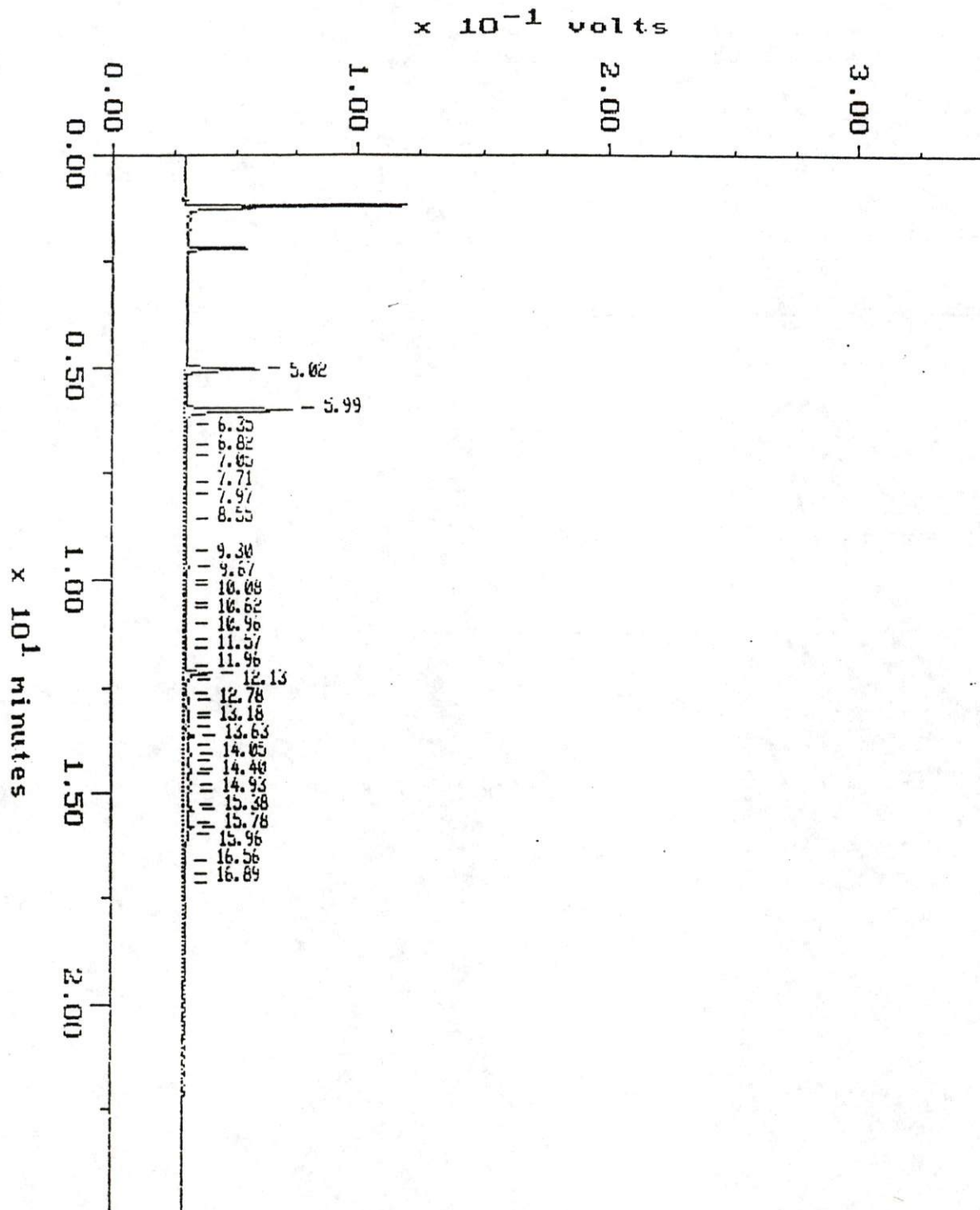


WTPH6

Sample: 9209-2/5-7
Acquired: 01-OCT-92 5:21

Channel: FID
Method: H:\BRU2\MAXDATA\BALZAC\09308292

Filename: 09308236
Operator: BOB

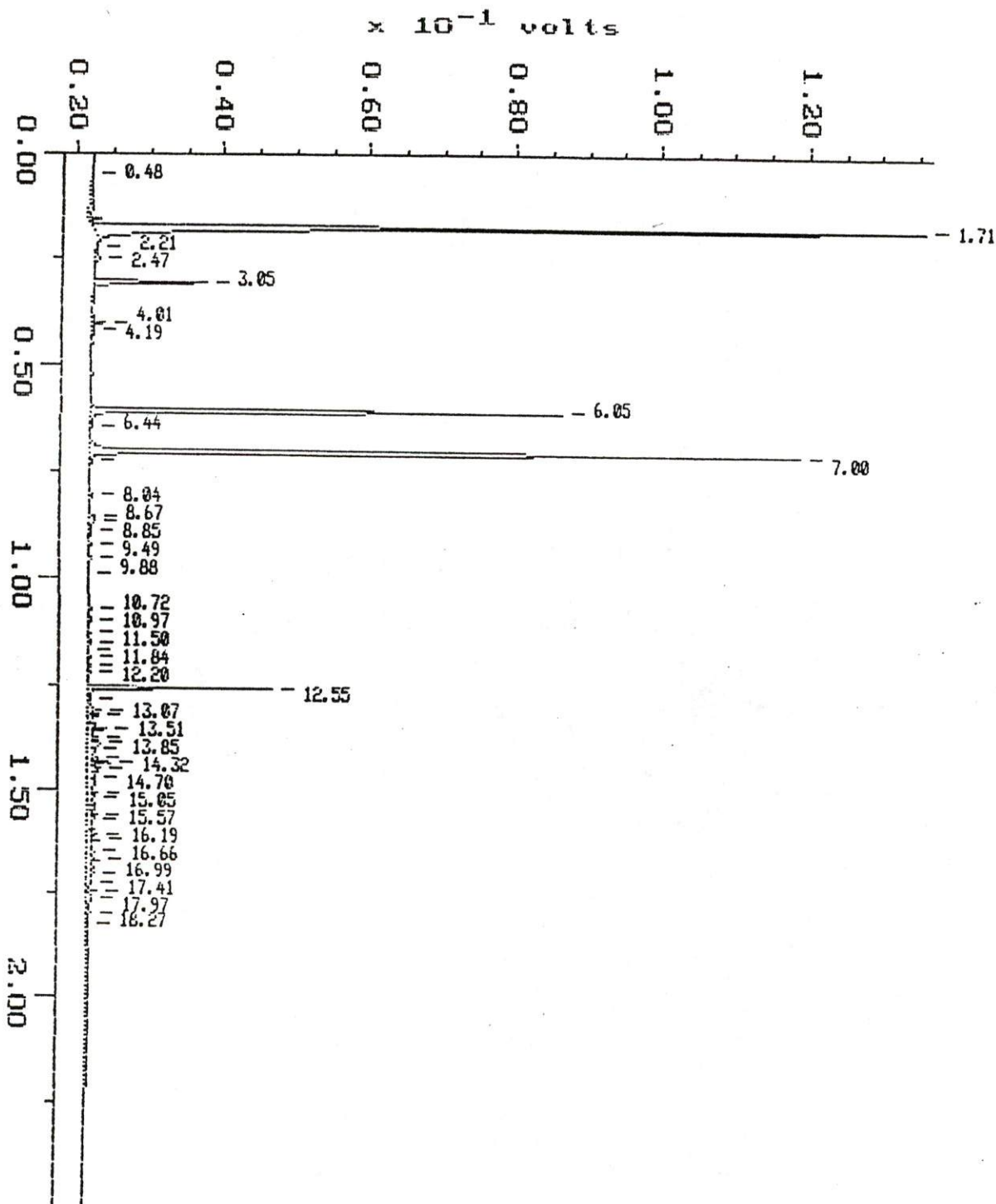


WTPH6

Sample: 9209-275-8
Acquired: 30-SEP-92 16:48

Channel: JEROME-FID
Method: H:\BRO2\MAXDATA\JEROME\J093092A

Filename: 0930JRW8
Operator:



WTPHG

Sample: 9209-275-9

Channel: JEROME-FID

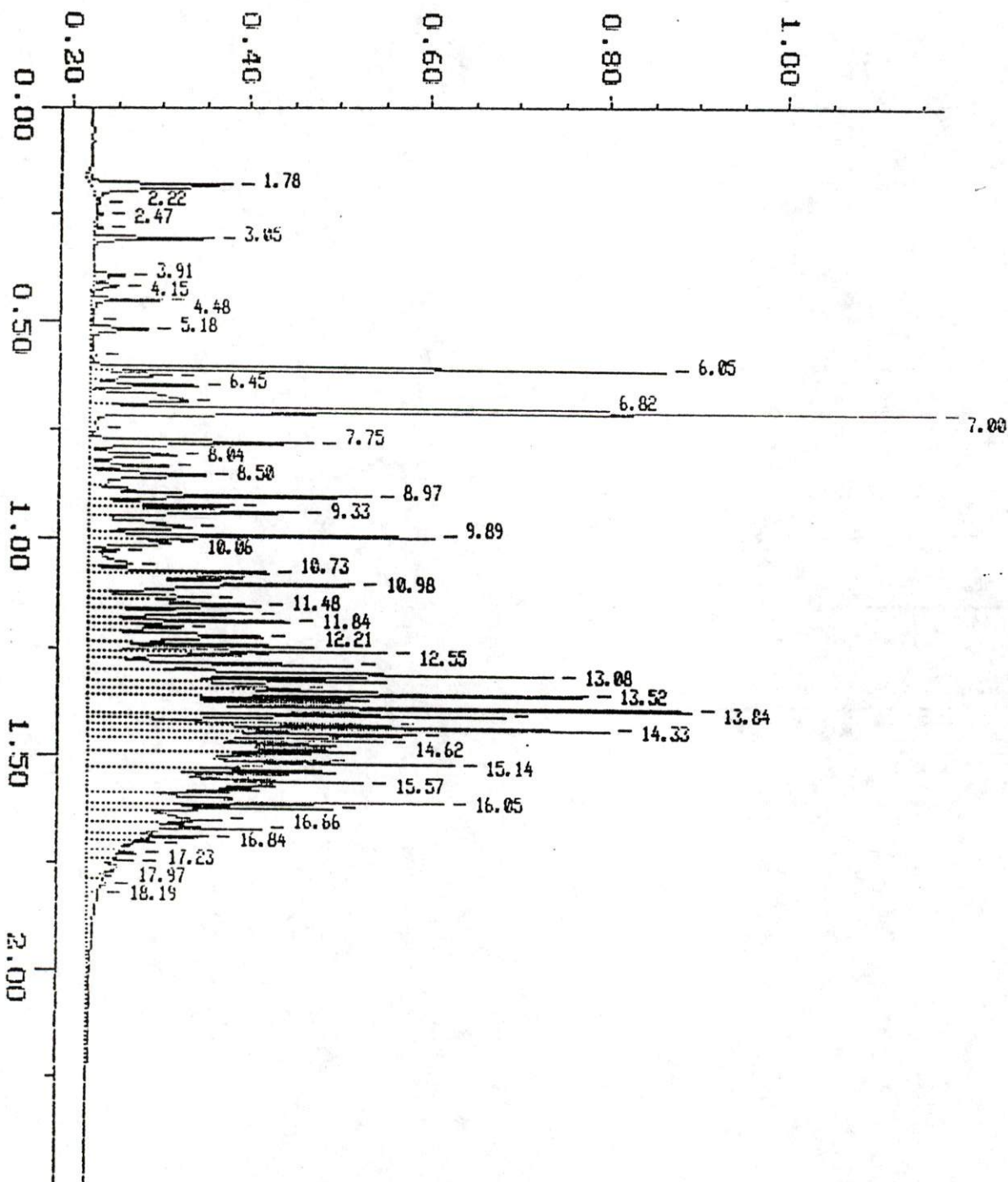
Filename: G930JR09

Acquired: 30-SEP-92 17:17

Method: H:\BRO2\MAXDATA\JEROME\J093092A

Operator:

$\times 10^{-1}$ volts

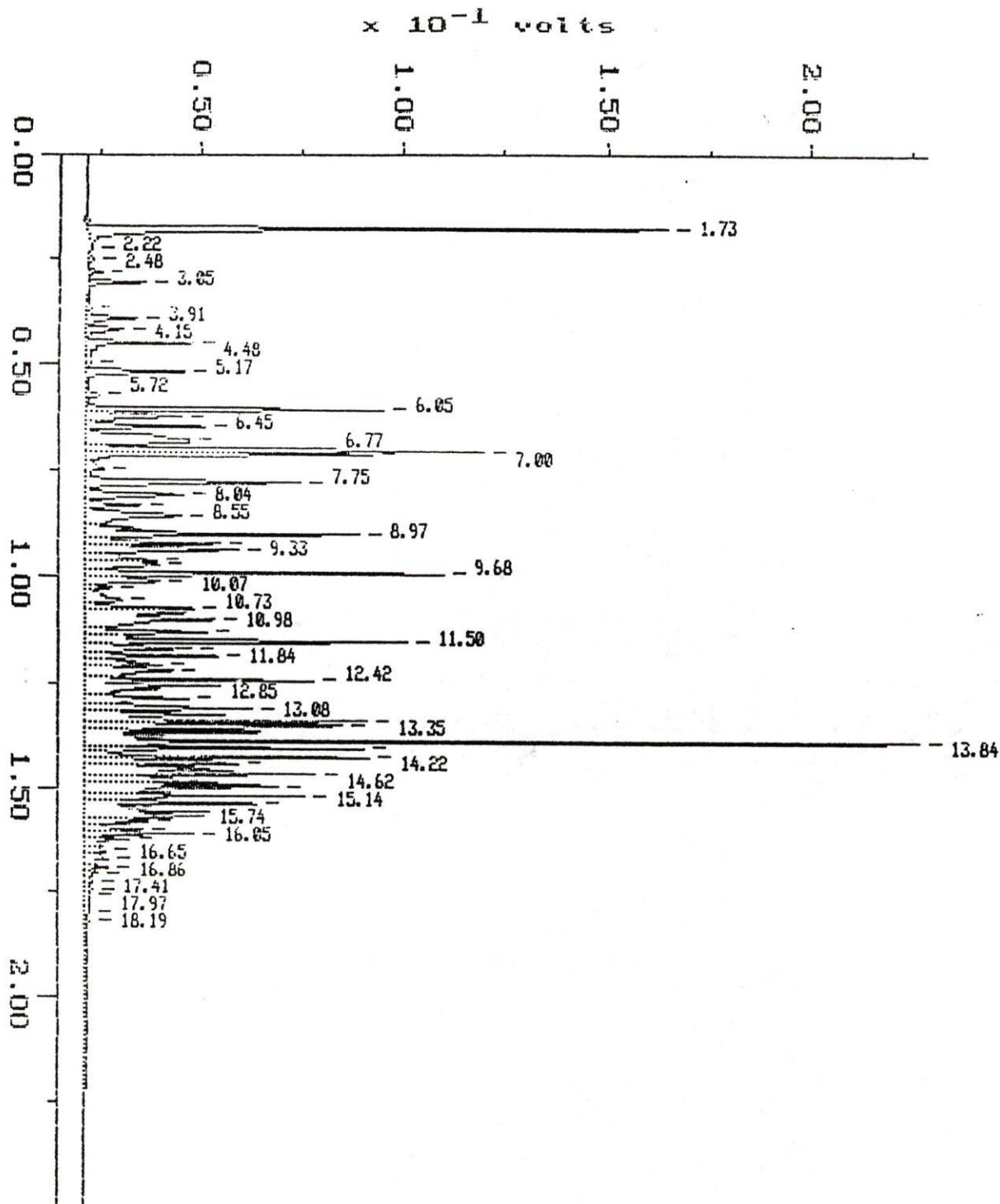


WTP4G

Sample: 9209-275-10
Acquired: 30-SEP-92 17:46

Channel: JEROME-FID
Method: H:\BRO2\MAXDATA\JEROME\J093092A

Filename: 0930JR10
Operator:

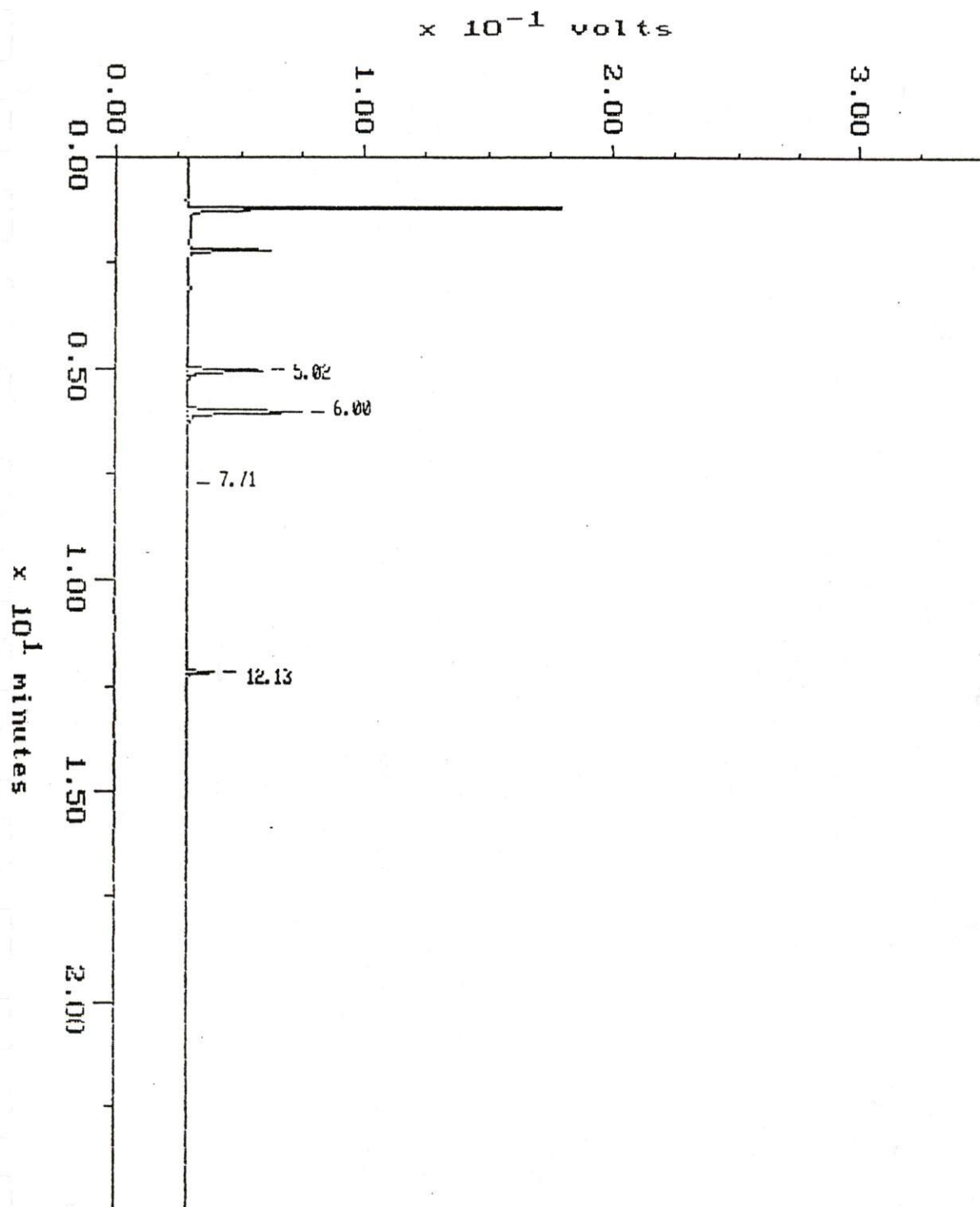


WTPH6 method Blank

Sample: SRB 9/28
Acquired: 30-SEP-92 20:24

Channel: F10
Method: H:\BRJ2\MAXDATA\BALZAC\09308Z92

Filename: 09308Z17
Operator: BOB

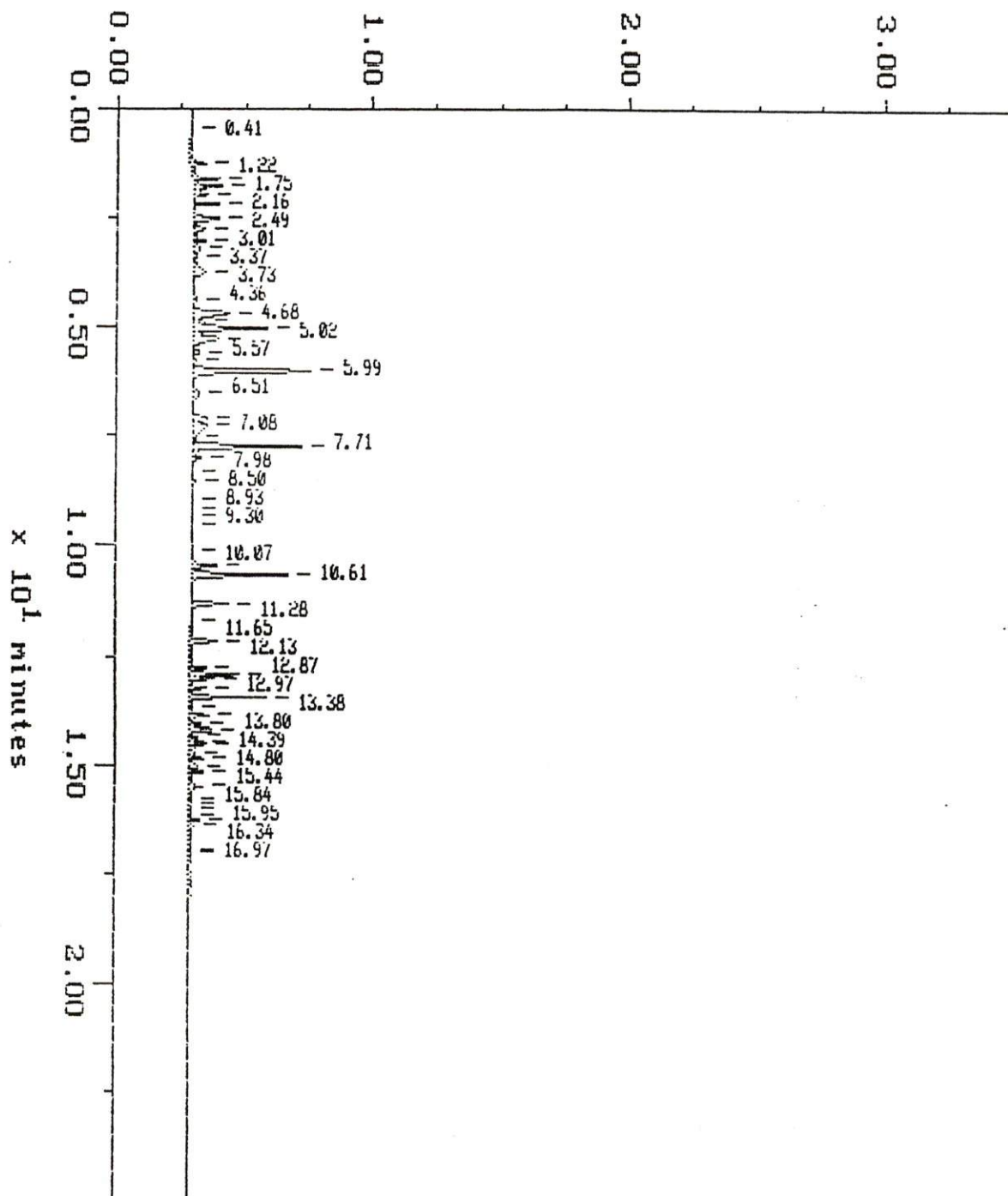


WTPHG C-C.

Sample: STD-C 9/30 Channel: FID
Acquired: 30-SEP-92 11:52 Method: H:\BR02\MAXDATA\BALZAC\0930BZ92

Filename: 0930BZ03
Operator: BJB

$\times 10^{-1}$ volts



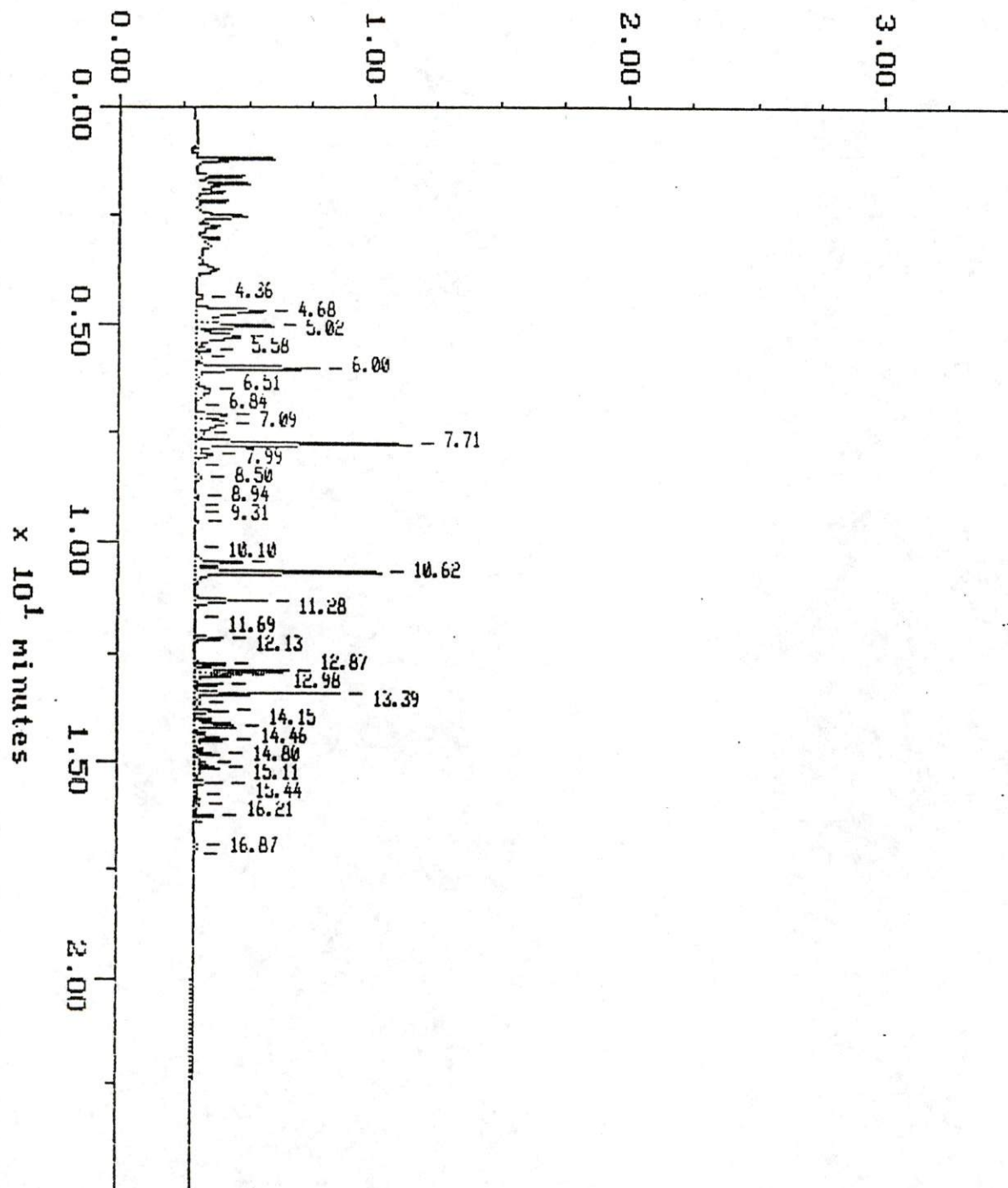
WTPH6 C.C.

Sample: C.C. 2 PPM
Acquired: 01-OCT-92 9:06

Channel: F10
Method: H:\BRJ2\MAXDATA\BALZAC\09300792

Filename: 09300737
Operator: BOB

$\times 10^{-1}$ volts



WTPHG C.C.

Sample: STD-C 10/4

Channel: FID

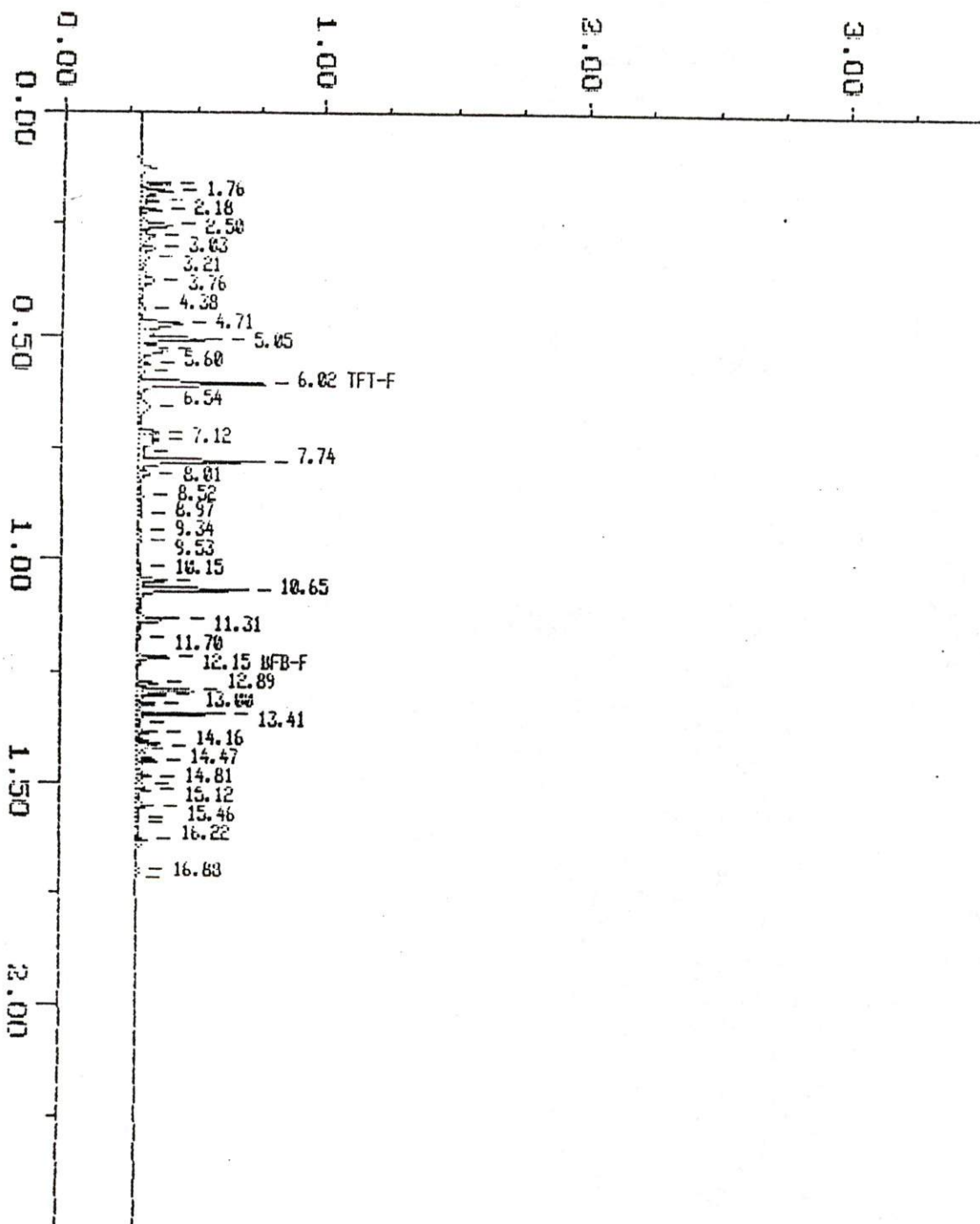
Filename: 10048203

Acquired: 04-OCT-92 9:58

Method: H:\BRO2\MAXDATA\BGLZAC\10048292

Operator: BCB

$\times 10^{-1}$ volts



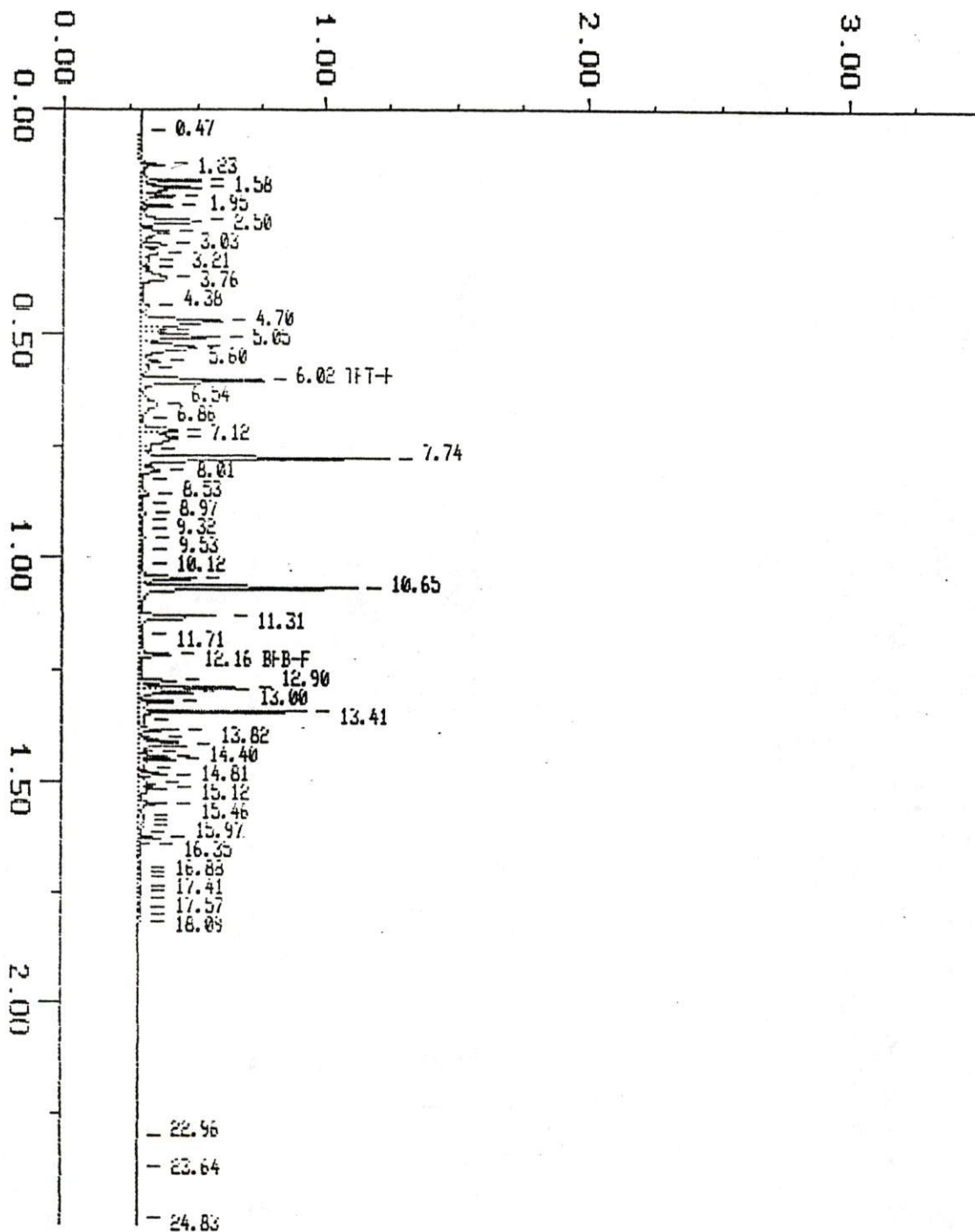
WTPH6 C.C.

Sample: C.C. 2 PPM
Acquired: 04-OCT-92 19:19

Channel: FID
Method: H:\8R02\MAXDATA\BALZAC\10048292

Filename: 1004BZ15
Operator: BJB

$\times 10^{-1}$ volts



CHAIN OF CUSTODY RECORD

GEOENGINEERS, INC.
8410 154TH AVENUE N.E.
REDMOND, WASHINGTON 98052
(206) 861-6000



DATE 9/25/92
PAGE 1 OF 1
LAB
LAB NO. 9209-275

PROJECT NAME/LOCATION <u>Cherem Bellingham</u>						ANALYSIS REQUIRED												NOTES/COMMENTS
PROJECT NUMBER <u>372-080-R4</u>																		(Preserved, filtered, etc.)
PROJECT MANAGER <u>Kurt Fraese</u>																		
SAMPLED BY <u>DAVE KING</u>																		
SAMPLE IDENTIFICATION		SAMPLE COLLECTION			# OF JARS	WTPH-6	BETX 8020											
LAB	GEOENGINEERS	DATE	TIME	MATRIX														
-1	920924-69	9/24/92	845	Soil	1	X	X											
-2	920924-610		1015		1	X	X											
-3	920924-611		1025		1	X	X											
-4	920924-612		1030		1	X	X											
-5	920924-SS2-1		1100		1	X	X											
-6	920924-SS2-2		1110		1	X	X											
-7	920924-SS2-3		1115		1	X	X											
-8	920924-SS2-4		1120		1	X	X											
-9	920924-SS2-5		1125		1	X	X											
-10	920924-SS2-6		1130		1	X	X											

RELINQUISHED BY SIGNATURE <u>[Signature]</u> PRINTED NAME <u>DAVID KING</u> DATE <u>9/24/92</u> TIME <u>7:45</u>	FIRM <u>GET</u>	RELINQUISHED BY: Rec By SIGNATURE <u>[Signature]</u> PRINTED NAME <u>STINA KENSLEK</u> DATE <u>9/25/92</u> TIME <u>10:06</u>	FIRM <u>ATI</u>	RELINQUISHED BY SIGNATURE PRINTED NAME DATE TIME	FIRM
RECEIVED BY SIGNATURE <u>[Signature]</u> PRINTED NAME <u>DAVID KING</u> DATE <u>9/25/92</u> TIME <u>7:45</u>	FIRM <u>GET</u>	RECEIVED BY SIGNATURE PRINTED NAME DATE TIME	FIRM	RECEIVED BY SIGNATURE PRINTED NAME DATE TIME	FIRM

ADDITIONAL COMMENTS: If possible no later than 1 week T.A.T for WTPH-6



Analytical Technologies, Inc.

17400 S.W. Upper Boones Ferry Road, Suite 270

Durham, OR 97224

(503) 684-0447 (503) 620-0393 (FAX)

ATI I.D. 210568

November 3, 1992

GeoEngineers

Kurt Fraese
GeoEngineers, Inc.
8410 154th Avenue N.E.
Redmond WA 98052

NOV 05 1992

Routing *KRE* ☐ ☐ ☐
File ☐ ☐ ☐

Project Name/Number: Chevron - Bellingham / 372-080-R4

Attention: Kurt Fraese

On October 28, 1992, Analytical Technologies, Inc. received five soil samples for analysis for the above listed project. The samples were analyzed with EPA methodology or equivalent methods. The results of these analyses and the quality control data, which follow each set of analyses, are enclosed.

If you have any questions or comments, please do not hesitate to contact us at (503)684-0447.

Fred Voosen

Fred Voosen
Project Manager

Alan J. Kleinschmidt

Alan J. Kleinschmidt
Laboratory Manager

AJK:alm
Enclosure

SAMPLE CROSS REFERENCE SHEET

CLIENT: GeoEngineers, Inc. ATI I.D.: 210568
PROJECT #: 372-080-R4
PROJECT NAME: Chevron - Bellingham MATRIX: Soil

ATI #	CLIENT DESCRIPTION	DATE SAMPLED
210568-1	921027-AS1	10/27/92
210568-2	921027-AS2	10/27/92
210568-3	921027-AS3D	10/27/92
210568-4	921027-AS4D	10/27/92
210568-5	921027-AS5	10/27/92

-----TOTALS-----

MATRIX
Soil

SAMPLES
5

ATI STANDARD DISPOSAL PRACTICE

The samples from this project will be disposed of in thirty (30) days from the date of the report. If an extended storage period is required, please contact our sample control department before the scheduled disposal date.



ANALYTICAL SCHEDULE

CLIENT: GeoEngineers, Inc. ATI I.D.: 210568
PROJECT #: 372-080-R4
PROJECT NAME: Chevron - Bellingham

ANALYSIS	TECHNIQUE	REFERENCE	LAB
Petroleum Hydrocarbon	GC/PID	WA TPH-G	PLD
BETX	GC/PID	EPA 8020M	PLD

PLD = ATI - Portland
■ = ATI - Renton
SD = ATI - San Diego
HX = ATI - Phoenix
NR = ATI - Pensacola
FC = ATI - Fort Collins
UB = Subcontract

TEST:	TPH-GASOLINE (WASHINGTON)	ATI I.D.:	210568-0
CLIENT I.D.:	Method Blank	DATE SAMPLED:	N/A
CLIENT:	GeoEngineers, Inc.	DATE EXTRACTED:	10/28/92
PROJECT #:	372-080-R4	DATE ANALYZED:	10/28/92
PROJECT NAME:	Chevron - Bellingham	DILUTION FACTOR:	1
SAMPLE MATRIX:	SOIL	UNITS:	mg/Kg

RESULTS CORRECTED FOR MOISTURE CONTENT

PARAMETER	MRL	RESULTS
GASOLINE	5.0	ND
TOLUENE-DODECANE		
TRIFLUOROTOLUENE	89%	



TEST: TPH-GASOLINE (WASHINGTON)
CLIENT I.D.: 921027-AS1
CLIENT: GeoEngineers, Inc.
PROJECT #: 372-080-R4
PROJECT NAME: Chevron - Bellingham
SAMPLE MATRIX: SOIL

ATI I.D.: 210568-1
DATE SAMPLED: 10/27/92
DATE EXTRACTED: 10/28/92
DATE ANALYZED: 10/28/92
DILUTION FACTOR: 1
UNITS: mg/Kg

RESULTS CORRECTED FOR MOISTURE CONTENT

PARAMETER	MRL	RESULTS
GASOLINE	5.6	ND
TOLUENE-DODECANE		
TRIFLUOROTOLUENE	85%	



TEST: TPH-GASOLINE (WASHINGTON)
CLIENT I.D.: 921027-AS2
CLIENT: GeoEngineers, Inc.
PROJECT #: 372-080-R4
PROJECT NAME: Chevron - Bellingham
SAMPLE MATRIX: SOIL

ATI I.D.: 210568-2
DATE SAMPLED: 10/27/92
DATE EXTRACTED: 10/28/92
DATE ANALYZED: 10/28/92
DILUTION FACTOR: 1
UNITS: mg/Kg

RESULTS CORRECTED FOR MOISTURE CONTENT

PARAMETER	MRL	RESULTS
GASOLINE	6.2	ND
TOLUENE-DODECANE		
TRIFLUOROTOLUENE	82%	



TEST:	TPH-GASOLINE (WASHINGTON)	ATI I.D.:	210568-3
CLIENT I.D.:	921027-AS3D	DATE SAMPLED:	10/27/92
CLIENT:	GeoEngineers, Inc.	DATE EXTRACTED:	10/28/92
PROJECT #:	372-080-R4	DATE ANALYZED:	10/28/92
PROJECT NAME:	Chevron - Bellingham	DILUTION FACTOR:	1
SAMPLE MATRIX:	SOIL	UNITS:	mg/Kg

RESULTS CORRECTED FOR MOISTURE CONTENT

PARAMETER	MRL	RESULTS
GASOLINE	5.8	230
TOLUENE-DODECANE		
RIFLUOROTOLUENE	94%	



TEST:	TPH-GASOLINE (WASHINGTON)	ATI I.D.:	210568-4
CLIENT I.D.:	921027-AS4D	DATE SAMPLED:	10/27/92
CLIENT:	GeoEngineers, Inc.	DATE EXTRACTED:	10/28/92
PROJECT #:	372-080-R4	DATE ANALYZED:	10/28/92
PROJECT NAME:	Chevron - Bellingham	DILUTION FACTOR:	5
SAMPLE MATRIX:	SOIL	UNITS:	mg/Kg

RESULTS CORRECTED FOR MOISTURE CONTENT

PARAMETER	MRL	RESULTS
GASOLINE	28	1000
TOLUENE-DODECANE		
TRIFLUOROTOLUENE	129%	



TEST: TPH-GASOLINE (WASHINGTON)
CLIENT I.D.: 921027-AS5
CLIENT: GeoEngineers, Inc.
PROJECT #: 372-080-R4
PROJECT NAME: Chevron - Bellingham
SAMPLE MATRIX: SOIL

ATI I.D.: 210568-5
DATE SAMPLED: 10/27/92
DATE EXTRACTED: 10/28/92
DATE ANALYZED: 10/28/92
DILUTION FACTOR: 1
UNITS: mg/Kg

RESULTS CORRECTED FOR MOISTURE CONTENT

PARAMETER	MRL	RESULTS
GASOLINE	6.4	120
TOLUENE-DODECANE		
TRIFLUOROTOLUENE	87%	

GAS CHROMATOGRAPHY DUPLICATE RESULTS

TEST:	TPH-GASOLINE (WASHINGTON)	ATI ACCESSION:	210568
CLIENT:	GeoEngineers, Inc.	QC SAMPLE:	210568-2
PROJECT #:	372-080-R4	DATE EXTRACTED:	10/28/92
PROJECT NAME:	Chevron - Bellingham	DATE ANALYZED:	10/28/92
SAMPLE MATRIX:	SOIL	DILUTION FACTOR:	1
		UNITS:	mg/Kg

RESULTS CORRECTED FOR MOISTURE CONTENT

PARAMETER	MRL	SAMPLE RESULT	SAMPLE DUP	
			RESULT	RPD
GASOLINE	6.2	ND	ND	N/A



Analytical Technologies, Inc.

GAS CHROMATOGRAPHY SPIKE RESULTS

TEST: TPH-GASOLINE (WASHINGTON)
CLIENT: GeoEngineers, Inc.
PROJECT #: 372-080-R4
PROJECT NAME: Chevron - Bellingham
SAMPLE MATRIX: SOIL

ATI ACCESSION: 210568
QC SAMPLE: Method Blank
DATE EXTRACTED: 10/28/92
DATE ANALYZED: 10/28/92
DILUTION FACTOR: 1
UNITS: mg/Kg

RESULTS CORRECTED FOR MOISTURE CONTENT

PARAMETER	MRL	SAMPLE RESULT	SPIKE CONC.	SPIKED RESULT	% REC.	DUP. SPIKED RESULT	DUP. % REC.	RPD
GASOLINE	5.0	ND	100	109	109	112	112	3



Analytical Technologies, Inc.

GAS CHROMATOGRAPHY SPIKE RESULTS

TEST: TPH-GASOLINE (WASHINGTON)
CLIENT: GeoEngineers, Inc.
PROJECT #: 372-080-R4
PROJECT NAME: Chevron - Bellingham
SAMPLE MATRIX: SOIL

ATI ACCESSION: 210568
QC SAMPLE: 210568-1
DATE EXTRACTED: 10/28/92
DATE ANALYZED: 10/28/92
DILUTION FACTOR: 1
UNITS: mg/Kg

RESULTS CORRECTED FOR MOISTURE CONTENT

PARAMETER	MRL	SAMPLE RESULT	SPIKE CONC.	SPIKED RESULT	% REC.	DUP. SPIKED RESULT	DUP. % REC.	RPD
GASOLINE	5.6	ND	111	117	105	120	108	3



GAS CHROMATOGRAPHY RESULTS

TEST:	BETX (EPA 8020M)	ATI I.D.:	210568-0
CLIENT I.D.:	Method Blank	DATE SAMPLED:	N/A
CLIENT:	GeoEngineers, Inc. 372-080-R4	DATE EXTRACTED:	10/29/92
PROJECT #:	372-080-124	DATE ANALYZED:	10/29/92
PROJECT NAME:	Chevron - Bellingham	DILUTION FACTOR:	1
SAMPLE MATRIX:	SOIL	UNITS:	mg/Kg

RESULTS CORRECTED FOR MOISTURE CONTENT

PARAMETER	MRL	RESULTS
BENZENE	0.025	ND
TOLUENE	0.025	ND
ETHYLBENZENE	0.025	ND
TOTAL XYLENES	0.025	ND

SURROGATE:

TRIFLUOROTOLUENE

100%

GAS CHROMATOGRAPHY RESULTS

TEST:	BETX (EPA 8020M)	ATI I.D.:	210568-1
CLIENT I.D.:	921027-AS1	DATE SAMPLED:	10/27/92
CLIENT:	GeoEngineers, Inc. 372-080-R4	DATE EXTRACTED:	10/29/92
PROJECT #:	372-080-124	DATE ANALYZED:	10/29/92
PROJECT NAME:	Chevron - Bellingham	DILUTION FACTOR:	1
SAMPLE MATRIX:	SOIL	UNITS:	mg/Kg

RESULTS CORRECTED FOR MOISTURE CONTENT

PARAMETER	MRL	RESULTS
BENZENE	0.028	ND
TOLUENE	0.028	ND
ETHYLBENZENE	0.028	ND
TOTAL XYLENES	0.028	ND

SURROGATE:
TRIFLUOROTOLUENE

92%

GAS CHROMATOGRAPHY RESULTS

TEST:	BETX (EPA 8020M)	ATI I.D.:	210568-2
CLIENT I.D.:	921027-AS2	DATE SAMPLED:	10/27/92
CLIENT:	GeoEngineers, Inc. 372-080-R4	DATE EXTRACTED:	10/29/92
PROJECT #:	372-080-124	DATE ANALYZED:	10/29/92
PROJECT NAME:	Chevron - Bellingham	DILUTION FACTOR:	1
SAMPLE MATRIX:	SOIL	UNITS:	mg/Kg

RESULTS CORRECTED FOR MOISTURE CONTENT

PARAMETER	MRL	RESULTS
BENZENE	0.031	ND
TOLUENE	0.031	ND
ETHYLBENZENE	0.031	ND
TOTAL XYLENES	0.031	ND

SURROGATE:
TRIFLUOROTOLUENE .87%



GAS CHROMATOGRAPHY SPIKE RESULTS

TEST:	BETX (EPA 8020M)	ATI ACCESSION:	210568
CLIENT:	GeoEngineers, Inc.	QC SAMPLE:	Method Blank
PROJECT #:	372-080-R4	DATE EXTRACTED:	10/29/92
PROJECT NAME:	Chevron - Bellingham	DATE ANALYZED:	10/29/92
SAMPLE MATRIX:	SOIL	DILUTION FACTOR:	1
		UNITS:	mg/Kg

RESULTS CORRECTED FOR MOISTURE CONTENT

PARAMETER	MRL	SAMPLE RESULT	SPIKE CONC.	SPIKED RESULT	% REC.	DUP. SPIKED RESULT	DUP. % REC.	RPD
BENZENE	0.025	ND	1.00	1.08	108	1.10	110	2
TOLUENE	0.025	ND	1.00	1.10	110	1.15	115	4
ETHYLBENZENE	0.025	ND	1.00	1.12	112	1.14	114	2
TOTAL XYLENES	0.025	ND	2.00	2.31	116	2.37	119	3



GAS CHROMATOGRAPHY SPIKE RESULTS

TEST: BETX (EPA 8020M)
CLIENT: GeoEngineers, Inc.
PROJECT #: 372-080-R4
PROJECT NAME: Chevron - Bellingham
SAMPLE MATRIX: SOIL

ATI ACCESSION: 210568
QC SAMPLE: 210571-4
DATE EXTRACTED: 10/29/92
DATE ANALYZED: 10/29/92
DILUTION FACTOR: 1
UNITS: mg/Kg

RESULTS CORRECTED FOR MOISTURE CONTENT

PARAMETER	MRL	SAMPLE RESULT	SPIKE CONC.	SPIKED RESULT	% REC.	DUP. SPIKED RESULT	DUP. % REC.	RPD
BENZENE	0.027	ND	1.09	1.09	100	1.10	101	1
TOLUENE	0.027	ND	1.09	1.14	105	1.15	106	1
ETHYLBENZENE	0.027	ND	1.09	1.13	104	1.15	106	2
TOTAL XYLENES	0.027	ND	2.17	2.34	108	2.38	110	2

PERCENT MOISTURES

TEST: Percent Moistures
CLIENT: GeoEngineers, Inc.
PROJECT #: 372-080-124
PROJECT NAME: Chevron - Bellingham

ATI ID: 210568
DATE ANALYZED: 10/28/92
MATRIX: SOIL

CLIENT ID	ATI ID	PERCENT MOISTURE
921027-AS1	210568-1	10
921027-AS2	210568-2	19
921027-AS3D	210568-3	14
921027-AS4D	210568-4	10
921027-AS5	210568-5	22

QUALITY CONTROL RESULTS

ATI ID	SAMPLE % MOI	DUPLICATE % MOI	RPD
210567-1	12	13	8

CHAIN OF CUSTODY RECORD

GEOENGINEERS, INC.
8410 154TH AVENUE N.E.
REDMOND, WASHINGTON 98052
(206) 861-6000



DATE 10/27/92
PAGE 1 OF 1
LAB ATI - Portland
LAB NO. 210568

release # 4571170

PROJECT NAME/LOCATION <u>Chevron Bellingham</u>						ANALYSIS REQUIRED												NOTES/COMMENTS	
PROJECT NUMBER <u>372-080-R4</u>																		(Preserved, filtered, etc.)	
PROJECT MANAGER <u>Kurt Fraese</u>																			
SAMPLED BY <u>DAVE KING</u>																			
SAMPLE IDENTIFICATION		SAMPLE COLLECTION			# OF	WTPH-6	BETX												
LAB	GEOENGINEERS	DATE	TIME	MATRIX	JARS														
1	921027-AS1	10/27/92	1410	S	1	X	X											Run BETX if WTPH-6 conc. is less than <u>100</u> (mg/kg) ↓	
2	921027-AS2		1430		1	X	X												
3	921027-AS3		1510		1	X	X												
4	921027-AS4		1515		1	X	X												
5	921027-AS5		1520		1	X	X												
	921027-AS6				1	X	X												

RELINQUISHED BY David King FIRM GET
SIGNATURE
PRINTED NAME DAVID KING
DATE 10/27/92 TIME 1620
RECEIVED BY Janice Jacoby FIRM ATI
SIGNATURE
PRINTED NAME JANICE JACOBY
DATE 10/28/92 TIME 0915

RELINQUISHED BY FIRM
SIGNATURE
PRINTED NAME
DATE TIME
RECEIVED BY FIRM
SIGNATURE
PRINTED NAME
DATE TIME

RELINQUISHED BY FIRM
SIGNATURE
PRINTED NAME
DATE TIME
RECEIVED BY FIRM
SIGNATURE
PRINTED NAME
DATE TIME

rec. via FedX 10-28-92

ADDITIONAL COMMENTS:
* Belling: Chevron - Keith Kringler
release # 4571170
* 24 hour T.A.T on all samples - Rush -



Analytical **Technologies, Inc.**

560 Naches Avenue, S.W., Suite 101, Renton, WA 98055 (206) 228-8335
John H. Taylor, Jr., Laboratory Manager
Frederick W. Grothkopp, Technical Director

ATI I.D. # 9211-177

November 24, 1992

GeoEngineers

GeoEngineers, Inc.
8410 154th Avenue N.E.
Redmond, WA 98052

NOV 30 1992

Routing

File

Attention : Kurt Fraese

Project Number : 0372-080-R04

Project Name : Chevron/Bellingham

On November 17, 1992, Analytical Technologies, Inc., received eight samples for analysis. The samples were analyzed with EPA methodology or equivalent methods as specified in the attached analytical schedule. The results, sample cross reference, and quality control data are enclosed.


Donna M. McKinney
Senior Project Manager

DMM/hal/ff

ATI I.D. # 9211-177

SAMPLE CROSS REFERENCE SHEET

CLIENT : GEOENGINEERS, INC.
PROJECT # : 0372-080-R04
PROJECT NAME : CHEVRON/BELLINGHAM

ATI #	CLIENT DESCRIPTION	DATE SAMPLED	MATRIX
9211-177-1	921116-G22	11/16/92	SOIL
9211-177-2	921116-G25	11/16/92	SOIL
9211-177-3	921116-1	11/16/92	SOIL
9211-177-4	921116-2	11/16/92	SOIL
9211-177-5	921116-3	11/16/92	SOIL
9211-177-6	921116-4	11/16/92	SOIL
9211-177-7	921116-5	11/16/92	SOIL
9211-177-8	921116-6	11/16/92	SOIL

----- TOTALS -----

MATRIX	# SAMPLES
SOIL	8

ATI STANDARD DISPOSAL PRACTICE

The samples from this project will be disposed of in thirty (30) days from the date of the report. If an extended storage period is required, please contact our sample control department before the scheduled disposal date.



ATI I.D. # 9211-177

ANALYTICAL SCHEDULE

CLIENT : GEOENGINEERS, INC.
PROJECT # : 0372-080-R04
PROJECT NAME : CHEVRON/BELLINGHAM

ANALYSIS	TECHNIQUE	REFERENCE	LAB
BETX	GC/PID	EPA 8020	R
TOTAL PETROLEUM HYDROCARBONS	GC/FID	WA DOE WTPH-G	R
MOISTURE	GRAVIMETRIC	CLP SOW ILMO1.0	R

R = ATI - Renton
SD = ATI - San Diego
PHX = ATI - Phoenix
PNR = ATI - Pensacola
FC = ATI - Fort Collins
SUB = Subcontract

ATI I.D. # 9211-177

QUALITY CONTROL
INFORMATION

CLIENT : GEOENGINEERS, INC.
PROJECT # : 0372-080-R04
PROJECT NAME : CHEVRON/BELLINGHAM

BETX

DETECTION LIMITS

	WATER	SOIL
Benzene	0.0005 mg/L	0.025 mg/Kg
Toluene	0.0005 mg/L	0.025 mg/Kg
Ethyl Benzene	0.0005 mg/L	0.025 mg/Kg
Xylenes	0.0005 mg/L	0.025 mg/Kg

CONTROL LIMITS

	WATER	RPD	SOIL	RPD
BLANK SPIKE				
Benzene	82-114	20	65-111	20
Toluene	81-116	20	70-119	20
Xylenes	75-120	20	72-119	20
MATRIX SPIKE				
Benzene	75-112	20	50-97	20
Toluene	71-122	20	53-105	20
Xylenes	70-117	20	60-105	20

WA DOE WTPH-G

DETECTION LIMITS

	SOIL
Gasoline	5 mg/Kg

CONTROL LIMITS

	SOIL	RPD
BLANK SPIKE		
Gasoline	86-114	20
MATRIX SPIKE		
Gasoline	59-107	20



ATI I.D. # 9211-177

VOLATILE ORGANIC COMPOUNDS
DATA SUMMARY

CLIENT	: GEOENGINEERS, INC.	DATE SAMPLED	: N/A
PROJECT #	: 0372-080-R04	DATE RECEIVED	: N/A
PROJECT NAME	: CHEVRON/BELLINGHAM	DATE EXTRACTED	: 11/17/92
CLIENT I.D.	: METHOD BLANK	DATE ANALYZED	: 11/18/92
SAMPLE MATRIX	: SOIL	UNITS	: mg/Kg
EPA METHOD	: 8020 (BETX)	DILUTION FACTOR	: 1

RESULTS ARE CORRECTED FOR MOISTURE CONTENT

COMPOUND	MDL	RESULT
BENZENE	0.025	ND
ETHYLBENZENE	0.025	ND
TOLUENE	0.025	ND
TOTAL XYLENES	0.025	ND

SURROGATE PERCENT RECOVERY

BROMOFLUOROBENZENE	102
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ATI I.D. # 9211-177-2

VOLATILE ORGANIC COMPOUNDS
DATA SUMMARY

CLIENT : GEOENGINEERS, INC.
PROJECT # : 0372-080-R04
PROJECT NAME : CHEVRON/BELLINGHAM
CLIENT I.D. : 921116-G25
SAMPLE MATRIX : SOIL
EPA METHOD : 8020 (BETX)

DATE SAMPLED : 11/16/92
DATE RECEIVED : 11/17/92
DATE EXTRACTED : 11/17/92
DATE ANALYZED : 11/18/92
UNITS : mg/Kg
DILUTION FACTOR : 1

RESULTS ARE CORRECTED FOR MOISTURE CONTENT

COMPOUND	MDL	RESULT
BENZENE	0.028	ND
ETHYLBENZENE	0.028	ND
TOLUENE	0.028	ND
TOTAL XYLENES	0.028	ND

SURROGATE PERCENT RECOVERY

BROMOFLUOROBENZENE

89

ATI I.D. # 9211-177-3

VOLATILE ORGANIC COMPOUNDS
DATA SUMMARY

CLIENT	: GEOENGINEERS, INC.	DATE SAMPLED	: 11/16/92
PROJECT #	: 0372-080-R04	DATE RECEIVED	: 11/17/92
PROJECT NAME	: CHEVRON/BELLINGHAM	DATE EXTRACTED	: 11/17/92
CLIENT I.D.	: 921116-1	DATE ANALYZED	: 11/18/92
SAMPLE MATRIX	: SOIL	UNITS	: mg/Kg
EPA METHOD	: 8020 (BETX)	DILUTION FACTOR	: 1

RESULTS ARE CORRECTED FOR MOISTURE CONTENT

COMPOUND	MDL	RESULT
BENZENE	0.031	ND
ETHYLBENZENE	0.031	0.051
TOLUENE	0.031	ND
TOTAL XYLENES	0.031	0.23

SURROGATE PERCENT RECOVERY

BROMOFLUOROBENZENE	92
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ATI I.D. # 9211-177-4

VOLATILE ORGANIC COMPOUNDS
DATA SUMMARY

CLIENT : GEOENGINEERS, INC.
PROJECT # : 0372-080-R04
PROJECT NAME : CHEVRON/BELLINGHAM
CLIENT I.D. : 921116-2
SAMPLE MATRIX : SOIL
EPA METHOD : 8020 (BETX)
RESULTS ARE CORRECTED FOR MOISTURE CONTENT

DATE SAMPLED : 11/16/92
DATE RECEIVED : 11/17/92
DATE EXTRACTED : 11/17/92
DATE ANALYZED : 11/18/92
UNITS : mg/Kg
DILUTION FACTOR : 1

COMPOUND	MDL	RESULT
BENZENE	0.031	ND
ETHYLBENZENE	0.031	ND
TOLUENE	0.031	ND
TOTAL XYLENES	0.031	ND

SURROGATE PERCENT RECOVERY

BROMOFLUOROBENZENE 100

ATI I.D. # 9211-177-5

VOLATILE ORGANIC COMPOUNDS
DATA SUMMARY

CLIENT	: GEOENGINEERS, INC.	DATE SAMPLED	: 11/16/92
PROJECT #	: 0372-080-R04	DATE RECEIVED	: 11/17/92
PROJECT NAME	: CHEVRON/BELLINGHAM	DATE EXTRACTED	: 11/17/92
CLIENT I.D.	: 921116-3	DATE ANALYZED	: 11/18/92
SAMPLE MATRIX	: SOIL	UNITS	: mg/Kg
EPA METHOD	: 8020 (BETX)	DILUTION FACTOR	: 1

RESULTS ARE CORRECTED FOR MOISTURE CONTENT

COMPOUND	MDL	RESULT
BENZENE	0.030	ND
ETHYLBENZENE	0.030	0.048
TOLUENE	0.030	ND
TOTAL XYLENES	0.030	0.062

SURROGATE PERCENT RECOVERY

BROMOFLUOROBENZENE	103
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ATI I.D. # 9211-177-6

VOLATILE ORGANIC COMPOUNDS
DATA SUMMARY

CLIENT : GEOENGINEERS, INC.
PROJECT # : 0372-080-R04
PROJECT NAME : CHEVRON/BELLINGHAM
CLIENT I.D. : 921116-4
SAMPLE MATRIX : SOIL
EPA METHOD : 8020 (BETX)

DATE SAMPLED : 11/16/92
DATE RECEIVED : 11/17/92
DATE EXTRACTED : 11/17/92
DATE ANALYZED : 11/18/92
UNITS : mg/Kg
DILUTION FACTOR : 1

RESULTS ARE CORRECTED FOR MOISTURE CONTENT

COMPOUND	MDL	RESULT
BENZENE	0.031	ND
ETHYLBENZENE	0.031	ND
TOLUENE	0.031	ND
TOTAL XYLENES	0.031	0.033

SURROGATE PERCENT RECOVERY

BROMOFLUOROBENZENE 96



ATI I.D. # 9211-177-7

VOLATILE ORGANIC COMPOUNDS
DATA SUMMARY

CLIENT	: GEOENGINEERS, INC.	DATE SAMPLED	: 11/16/92
PROJECT #	: 0372-080-R04	DATE RECEIVED	: 11/17/92
PROJECT NAME	: CHEVRON/BELLINGHAM	DATE EXTRACTED	: 11/17/92
CLIENT I.D.	: 921116-5	DATE ANALYZED	: 11/18/92
SAMPLE MATRIX	: SOIL	UNITS	: mg/Kg
EPA METHOD	: 8020 (BETX)	DILUTION FACTOR	: 1

RESULTS ARE CORRECTED FOR MOISTURE CONTENT

COMPOUND	MDL	RESULT
BENZENE	0.028	ND
ETHYLBENZENE	0.028	ND
TOLUENE	0.028	ND
TOTAL XYLENES	0.028	ND

SURROGATE PERCENT RECOVERY

BROMOFLUOROBENZENE	93
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ATI I.D. # 9211-177-8

VOLATILE ORGANIC COMPOUNDS
DATA SUMMARY

CLIENT : GEOENGINEERS, INC.
PROJECT # : 0372-080-R04
PROJECT NAME : CHEVRON/BELLINGHAM
CLIENT I.D. : 921116-6
SAMPLE MATRIX : SOIL
EPA METHOD : 8020 (BETX)

DATE SAMPLED : 11/16/92
DATE RECEIVED : 11/17/92
DATE EXTRACTED : 11/17/92
DATE ANALYZED : 11/18/92
UNITS : mg/Kg
DILUTION FACTOR : 1

RESULTS ARE CORRECTED FOR MOISTURE CONTENT

COMPOUND	MDL	RESULT
BENZENE	0.030	ND
ETHYLBENZENE	0.030	ND
TOLUENE	0.030	ND
TOTAL XYLENES	0.030	ND

SURROGATE PERCENT RECOVERY

BROMOFLUOROBENZENE

87



ATI I.D. # 9211-177

VOLATILE ORGANIC COMPOUNDS
QUALITY CONTROL DATA

CLIENT : GEOENGINEERS, INC.
PROJECT # : 0372-080-R04
PROJECT NAME : CHEVRON/BELLINGHAM
EPA METHOD : 8020 (BETX)

SAMPLE I.D. : 9211-177-2
DATE EXTRACTED : 11/17/92
DATE ANALYZED : 11/18/92
MATRIX : SOIL
UNITS : mg/Kg

COMPOUND	SAMPLE RESULT	SPIKE ADDED	SPIKED SAMPLE	% REC	DUP SPIKED SAMPLE	DUP % REC	RPD
BENZENE	ND	1.00	0.779	78	0.825	83	6
TOLUENE	ND	1.00	0.839	84	0.884	88	5
TOTAL XYLENES	ND	2.00	1.60	80	1.74	87	8

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative \% Difference)} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 100$$



ATI I.D. # 9211-177

VOLATILE ORGANIC COMPOUNDS
QUALITY CONTROL DATA

CLIENT : GEOENGINEERS, INC.
PROJECT # : 0372-080-R04
PROJECT NAME : CHEVRON/BELLINGHAM
EPA METHOD : 8020 (BETX)

SAMPLE I.D. : BLANK SPIKE
DATE EXTRACTED : 11/17/92
DATE ANALYZED : 11/18/92
MATRIX : SOIL
UNITS : mg/Kg

COMPOUND	SAMPLE RESULT	SPIKE ADDED	SPIKED SAMPLE	% REC	DUP SPIKED SAMPLE	DUP % REC	RPD
BENZENE	ND	1.00	0.893	89	0.863	86	3
TOLUENE	ND	1.00	0.966	97	0.940	94	3
TOTAL XYLENES	ND	2.00	1.90	95	1.80	90	5

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative \% Difference)} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 100$$



ATI I.D. # 9211-177

TOTAL PETROLEUM HYDROCARBON ANALYSIS
DATA SUMMARY

CLIENT	: GEOENGINEERS, INC.	DATE SAMPLED	: N/A
PROJECT #	: 0372-080-R04	DATE RECEIVED	: N/A
PROJECT NAME	: CHEVRON/BELLINGHAM	DATE EXTRACTED	: 11/17/92
CLIENT I.D.	: METHOD BLANK	DATE ANALYZED	: 11/17/92
SAMPLE MATRIX	: SOIL	UNITS	: mg/Kg
METHOD	: WA DOE WTPH-G	DILUTION FACTOR	: 1

RESULTS ARE CORRECTED FOR MOISTURE CONTENT

COMPOUND	MDL	RESULT
FUEL HYDROCARBONS	5	ND
HYDROCARBON RANGE		TOLUENE TO DODECANE
HYDROCARBON QUANTITATION USING		GASOLINE

SURROGATE PERCENT RECOVERY

TRIFLUOROTOLUENE	98
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ATI I.D. # 9211-177-2

TOTAL PETROLEUM HYDROCARBON ANALYSIS
DATA SUMMARY

CLIENT : GEOENGINEERS, INC.
PROJECT # : 0372-080-R04
PROJECT NAME : CHEVRON/BELLINGHAM
CLIENT I.D. : 921116-G25
SAMPLE MATRIX : SOIL
METHOD : WA DOE WTPH-G
RESULTS ARE CORRECTED FOR MOISTURE CONTENT

DATE SAMPLED : 11/16/92
DATE RECEIVED : 11/17/92
DATE EXTRACTED : 11/17/92
DATE ANALYZED : 11/18/92
UNITS : mg/Kg
DILUTION FACTOR : 1

COMPOUND	MDL	RESULT
FUEL HYDROCARBONS	6	ND
HYDROCARBON RANGE		TOLUENE TO DODECANE
HYDROCARBON QUANTITATION USING		GASOLINE

SURROGATE PERCENT RECOVERY

TRIFLUOROTOLUENE	87
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ATI I.D. # 9211-177-3

TOTAL PETROLEUM HYDROCARBON ANALYSIS
DATA SUMMARY

CLIENT : GEOENGINEERS, INC.
PROJECT # : 0372-080-R04
PROJECT NAME : CHEVRON/BELLINGHAM
CLIENT I.D. : 921116-1
SAMPLE MATRIX : SOIL
METHOD : WA DOE WTPH-G

DATE SAMPLED : 11/16/92
DATE RECEIVED : 11/17/92
DATE EXTRACTED : 11/17/92
DATE ANALYZED : 11/18/92
UNITS : mg/Kg
DILUTION FACTOR : 1

RESULTS ARE CORRECTED FOR MOISTURE CONTENT

COMPOUND	MDL	RESULT
FUEL HYDROCARBONS	6	28
HYDROCARBON RANGE		TOLUENE TO DODECANE
HYDROCARBON QUANTITATION USING		GASOLINE

SURROGATE PERCENT RECOVERY

TRIFLUOROTOLUENE	76
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ATI I.D. # 9211-177-4

TOTAL PETROLEUM HYDROCARBON ANALYSIS
DATA SUMMARY

CLIENT : GEOENGINEERS, INC.
PROJECT # : 0372-080-R04
PROJECT NAME : CHEVRON/BELLINGHAM
CLIENT I.D. : 921116-2
SAMPLE MATRIX : SOIL
METHOD : WA DOE WTPH-G

DATE SAMPLED : 11/16/92
DATE RECEIVED : 11/17/92
DATE EXTRACTED : 11/17/92
DATE ANALYZED : 11/18/92
UNITS : mg/Kg
DILUTION FACTOR : 1

RESULTS ARE CORRECTED FOR MOISTURE CONTENT

COMPOUND	MDL	RESULT
FUEL HYDROCARBONS	6	160
HYDROCARBON RANGE		TOLUENE TO DODECANE
HYDROCARBON QUANTITATION USING		GASOLINE

SURROGATE PERCENT RECOVERY

TRIFLUOROTOLUENE	82
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ATI I.D. # 9211-177-5

TOTAL PETROLEUM HYDROCARBON ANALYSIS
DATA SUMMARY

CLIENT	: GEOENGINEERS, INC.	DATE SAMPLED	: 11/16/92
PROJECT #	: 0372-080-R04	DATE RECEIVED	: 11/17/92
PROJECT NAME	: CHEVRON/BELLINGHAM	DATE EXTRACTED	: 11/17/92
CLIENT I.D.	: 921116-3	DATE ANALYZED	: 11/18/92
SAMPLE MATRIX	: SOIL	UNITS	: mg/Kg
METHOD	: WA DOE WTPH-G	DILUTION FACTOR	: 1
RESULTS ARE CORRECTED FOR MOISTURE CONTENT			

COMPOUND	MDL	RESULT
FUEL HYDROCARBONS	6	120
HYDROCARBON RANGE		TOLUENE TO DODECANE
HYDROCARBON QUANTITATION USING		GASOLINE

SURROGATE PERCENT RECOVERY

TRIFLUOROTOLUENE	79
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ATI I.D. # 9211-177-6

TOTAL PETROLEUM HYDROCARBON ANALYSIS
DATA SUMMARY

CLIENT : GEOENGINEERS, INC.
PROJECT # : 0372-080-R04
PROJECT NAME : CHEVRON/BELLINGHAM
CLIENT I.D. : 921116-4
SAMPLE MATRIX : SOIL
METHOD : WA DOE WTPH-G

DATE SAMPLED : 11/16/92
DATE RECEIVED : 11/17/92
DATE EXTRACTED : 11/17/92
DATE ANALYZED : 11/18/92
UNITS : mg/Kg
DILUTION FACTOR : 1

RESULTS ARE CORRECTED FOR MOISTURE CONTENT

COMPOUND	MDL	RESULT
FUEL HYDROCARBONS	6	92
HYDROCARBON RANGE		TOLUENE TO DODECANE
HYDROCARBON QUANTITATION USING		GASOLINE

SURROGATE PERCENT RECOVERY

TRIFLUOROTOLUENE	77
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ATI I.D. # 9211-177-7

TOTAL PETROLEUM HYDROCARBON ANALYSIS
DATA SUMMARY

CLIENT	: GEOENGINEERS, INC.	DATE SAMPLED	: 11/16/92
PROJECT #	: 0372-080-R04	DATE RECEIVED	: 11/17/92
PROJECT NAME	: CHEVRON/BELLINGHAM	DATE EXTRACTED	: 11/17/92
CLIENT I.D.	: 921116-5	DATE ANALYZED	: 11/18/92
SAMPLE MATRIX	: SOIL	UNITS	: mg/Kg
METHOD	: WA DOE WTPH-G	DILUTION FACTOR	: 1
RESULTS ARE CORRECTED FOR MOISTURE CONTENT			

COMPOUND	MDL	RESULT
FUEL HYDROCARBONS	6	16
HYDROCARBON RANGE		TOLUENE TO DODECANE
HYDROCARBON QUANTITATION USING		GASOLINE

SURROGATE PERCENT RECOVERY

TRIFLUOROTOLUENE	82
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ATI I.D. # 9211-177-8

TOTAL PETROLEUM HYDROCARBON ANALYSIS
DATA SUMMARY

CLIENT : GEOENGINEERS, INC.
PROJECT # : 0372-080-R04
PROJECT NAME : CHEVRON/BELLINGHAM
CLIENT I.D. : 921116-6
SAMPLE MATRIX : SOIL
METHOD : WA DOE WTPH-G
RESULTS ARE CORRECTED FOR MOISTURE CONTENT

DATE SAMPLED : 11/16/92
DATE RECEIVED : 11/17/92
DATE EXTRACTED : 11/17/92
DATE ANALYZED : 11/18/92
UNITS : mg/Kg
DILUTION FACTOR : 1

COMPOUND	MDL	RESULT
FUEL HYDROCARBONS	6	16
HYDROCARBON RANGE		TOLUENE TO DODECANE
HYDROCARBON QUANTITATION USING		GASOLINE

SURROGATE PERCENT RECOVERY

TRIFLUOROTOLUENE	72
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ATI I.D. # 9211-177

TOTAL PETROLEUM HYDROCARBON ANALYSIS
QUALITY CONTROL DATA

CLIENT : GEOENGINEERS, INC.
PROJECT # : 0372-080-R04
PROJECT NAME : CHEVRON/BELLINGHAM
METHOD : WA DOE WTPH-G
SAMPLE MATRIX : SOIL

SAMPLE I.D. # : 9211-177-2
DATE EXTRACTED : 11/17/92
DATE ANALYZED : 11/18/92
UNITS : mg/Kg

COMPOUND	SAMPLE RESULT	SAMPLE DUP. RESULT	RPD	SPIKE ADDED	SPIKED RESULT	% REC.	DUP. SPIKED RESULT	DUP. % REC.	RPD
PETROLEUM HYDROCARBONS (GASOLINE)	ND	ND	NC	100	93.7	94	93.8	94	0

NC = Not Calculable.

$$\% \text{ Recovery} = \frac{(\text{Spiked Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative \% Difference)} = \frac{|(\text{Spike Result} - \text{Dup. Spike Result})|}{\text{Average Result}} \times 100$$

ATI I.D. # 9211-177

TOTAL PETROLEUM HYDROCARBON ANALYSIS
QUALITY CONTROL DATA

CLIENT : GEOENGINEERS, INC.
PROJECT # : 0372-080-R04
PROJECT NAME : CHEVRON/BELLINGHAM
METHOD : WA DOE WTPH-G
SAMPLE MATRIX : SOIL

SAMPLE I.D. # : BLANK SPIKE
DATE EXTRACTED : 11/17/92
DATE ANALYZED : 11/17/92
UNITS : mg/Kg

COMPOUND	SAMPLE RESULT	SPIKE ADDED	SPIKED RESULT	% REC.	DUP. SPIKED RESULT	DUP. % REC.	RPD
PETROLEUM HYDROCARBONS (GASOLINE)	ND	100	105	105	101	101	4

$$\% \text{ Recovery} = \frac{(\text{Spiked Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative \% Difference)} = \frac{|(\text{Spike Result} - \text{Dup. Spike Result})|}{\text{Average Result}} \times 100$$



ATI I.D. # 9211-177

GENERAL CHEMISTRY ANALYSIS

CLIENT : GEOENGINEERS, INC.
PROJECT # : 0372-080-R04
PROJECT NAME : CHEVRON/BELLINGHAM

MATRIX : SOIL

PARAMETER DATE ANALYZED

MOISTURE (SAMPLE -2) 11/18/92

MOISTURE (SAMPLES -3
THROUGH -8) 11/17/92



ATI I.D. # 9211-177

GENERAL CHEMISTRY ANALYSIS
DATA SUMMARY

CLIENT : GEOENGINEERS, INC.
PROJECT # : 0372-080-R04
PROJECT NAME : CHEVRON/BELLINGHAM

MATRIX : SOIL

UNITS : %

ATI I.D. #	CLIENT I.D.	MOISTURE MDL	RESULT
9211-177-2	921116-G25	0.5	9.9
9211-177-3	921116-1	0.5	19
9211-177-4	921116-2	0.5	20
9211-177-5	921116-3	0.5	18
9211-177-6	921116-4	0.5	19
9211-177-7	921116-5	0.5	12
9211-177-8	921116-6	0.5	18

ATI I.D. # 9211-177

GENERAL CHEMISTRY ANALYSIS
QUALITY CONTROL DATA

CLIENT : GEOENGINEERS, INC.
PROJECT # : 0372-080-R04
PROJECT NAME : CHEVRON/BELLINGHAM

MATRIX : SOIL

UNITS : %

PARAMETER	ATI I.D.	SAMPLE RESULT	DUP RESULT	RPD	SPIKED RESULT	SPIKE ADDED	% REC
MOISTURE	9211-167-1	23	22	4	N/A	N/A	N/A
MOISTURE	9211-177-5	18	19	5	N/A	N/A	N/A

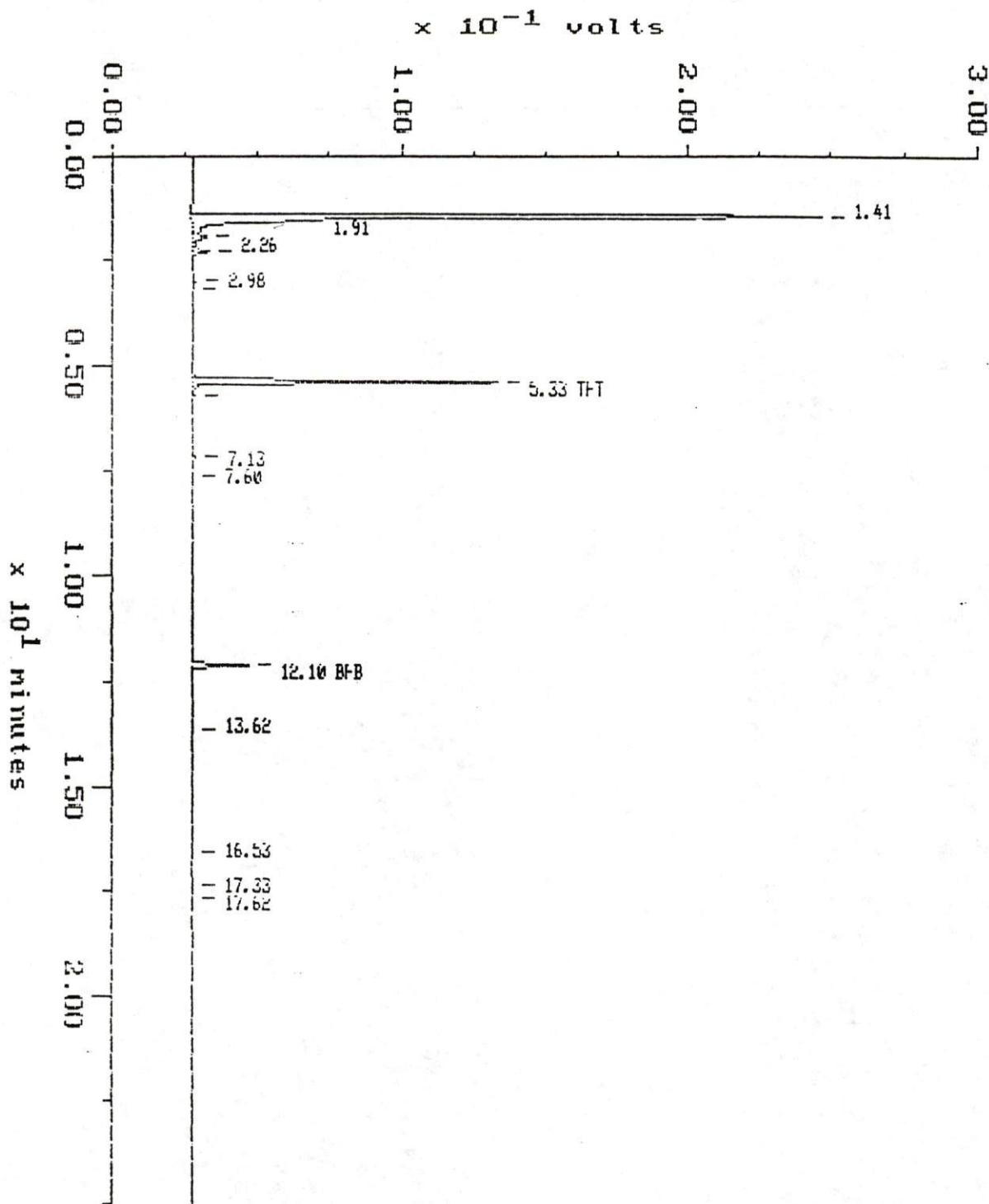
$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative \% Difference)} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 100$$

WA DOE WTPH-G

¹⁷⁷⁷
 Sample: 9211-172-2 Channel: PRISCILLA
 Acquired: 18-NOV-92 0:55 Method: H:\BR02\MAXDATA\ELVIS-PA\111792.F
 Comments: ATI FUELS: A MISSION OF EXCELLENCE IN ANALYTICAL CHROMATOGRAPHY.

Filename: 1117EP09
 Operator: ATI



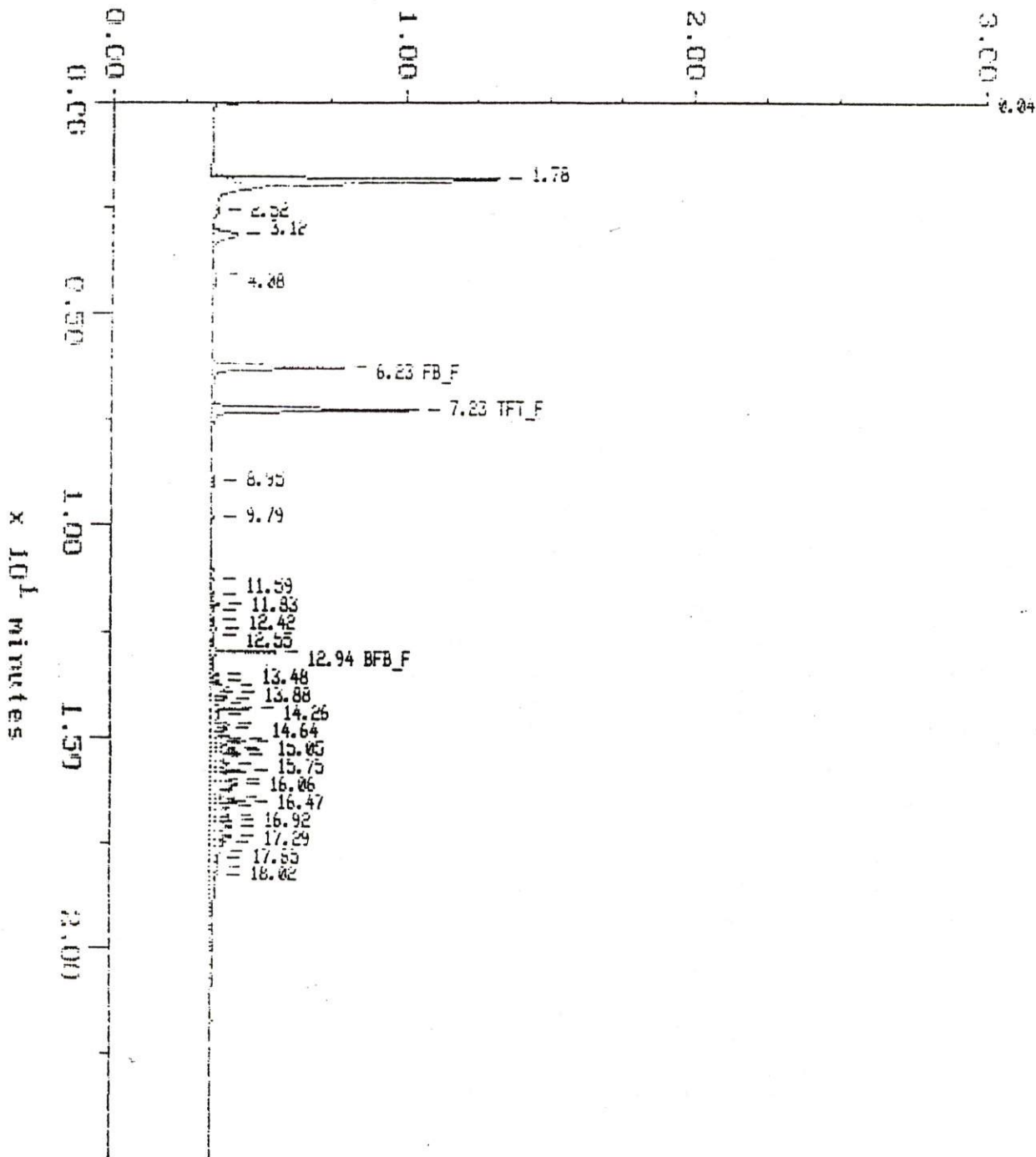
WA DOE WTPH-G

Sample: 9211-177-3
Acquired: 16-NOV-92 13:43

Channel: JEROME+ID
Method: H:\BK02\MAXDATA\JEROME\J111592A

Filename: 1116JN05
Operator:

$\times 10^{-1}$ Volts



WA DOE WTPH-G

Sample: 9211-177-4

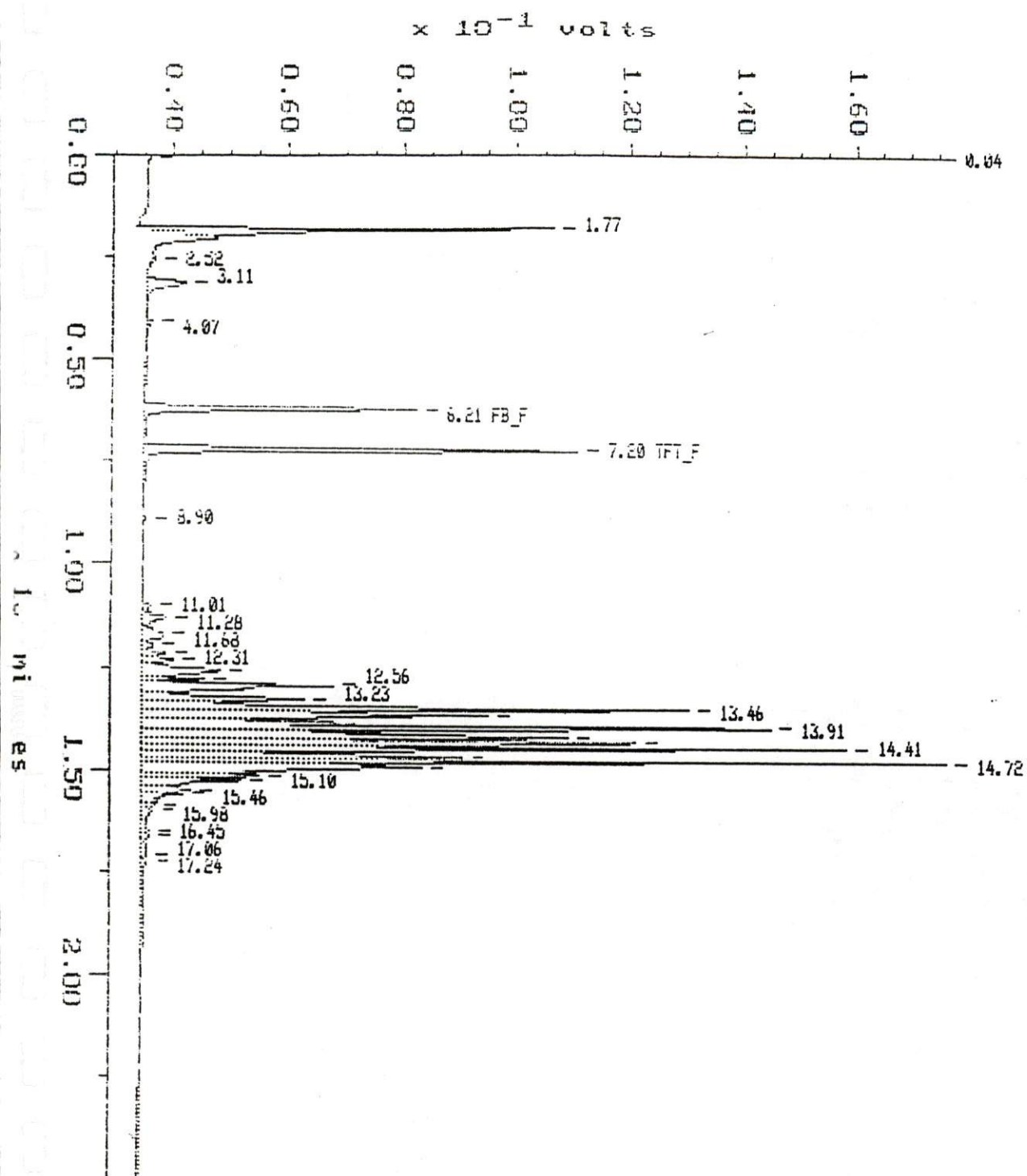
Channel: JEROME-FID

Filename: 1118JR06

Acquired: 18-NOV-92 14:11

Method: H:\BRU2\MAXDATA\JEROME\J111892A

Operator:



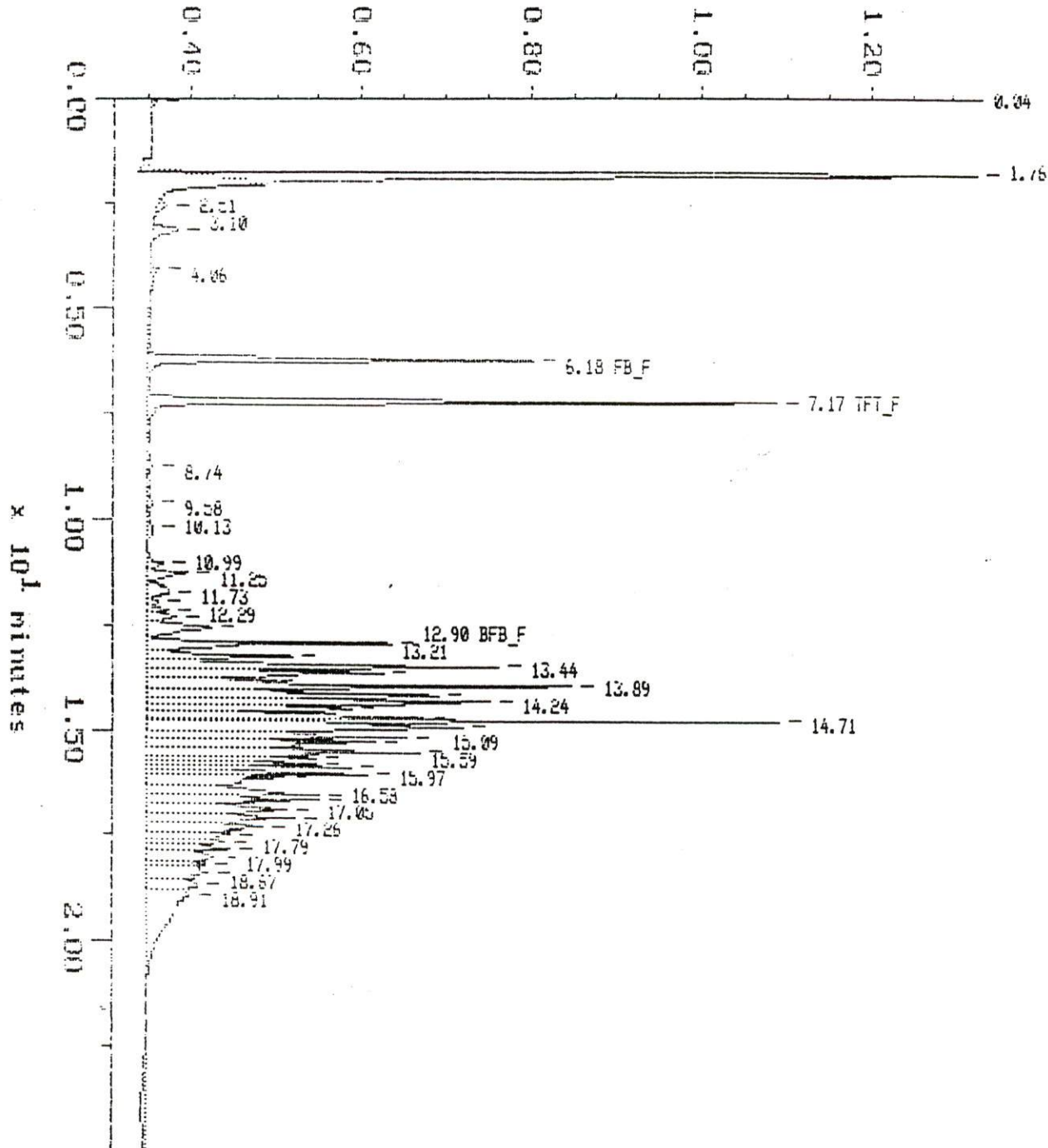
WA DOE WTPH-G

Sample: 9211-177-5
Acquired: 18-NOV-92 14:40

Channel: JEROME+ID
Method: H:\BRO2\MAXDATA\JEROME\J111892A

Filename: 1118JR07
Operator:

$\times 10^{-1}$ volts

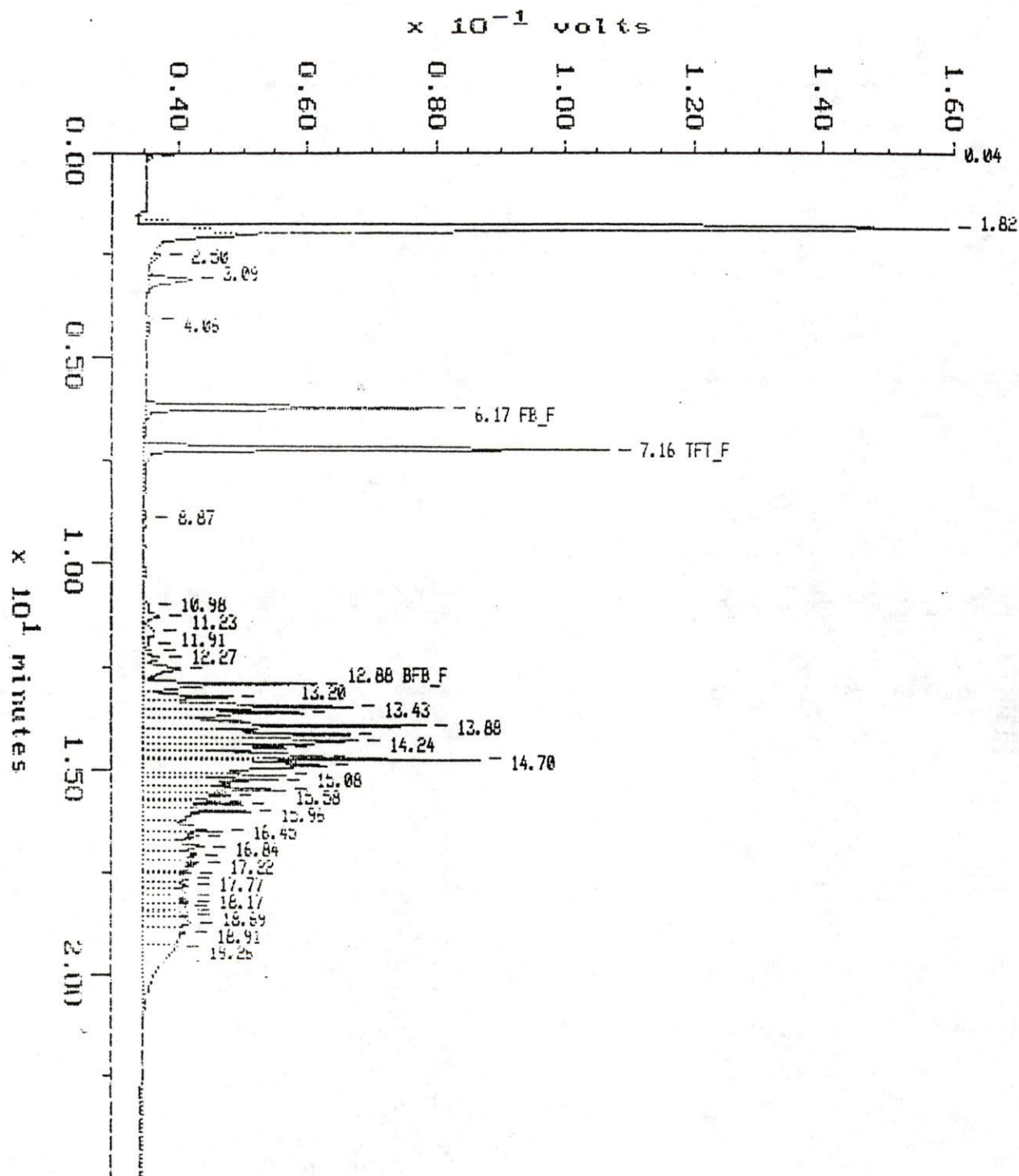


WA DOE WTPH-G

Sample: 9211-177-6
Acquired: 18-NOV-92 15:09

Channel: JEROME-FID
Method: H:\BRO2\MAXDATA\JEROME\J111892A

Filename: 1118JR08
Operator:

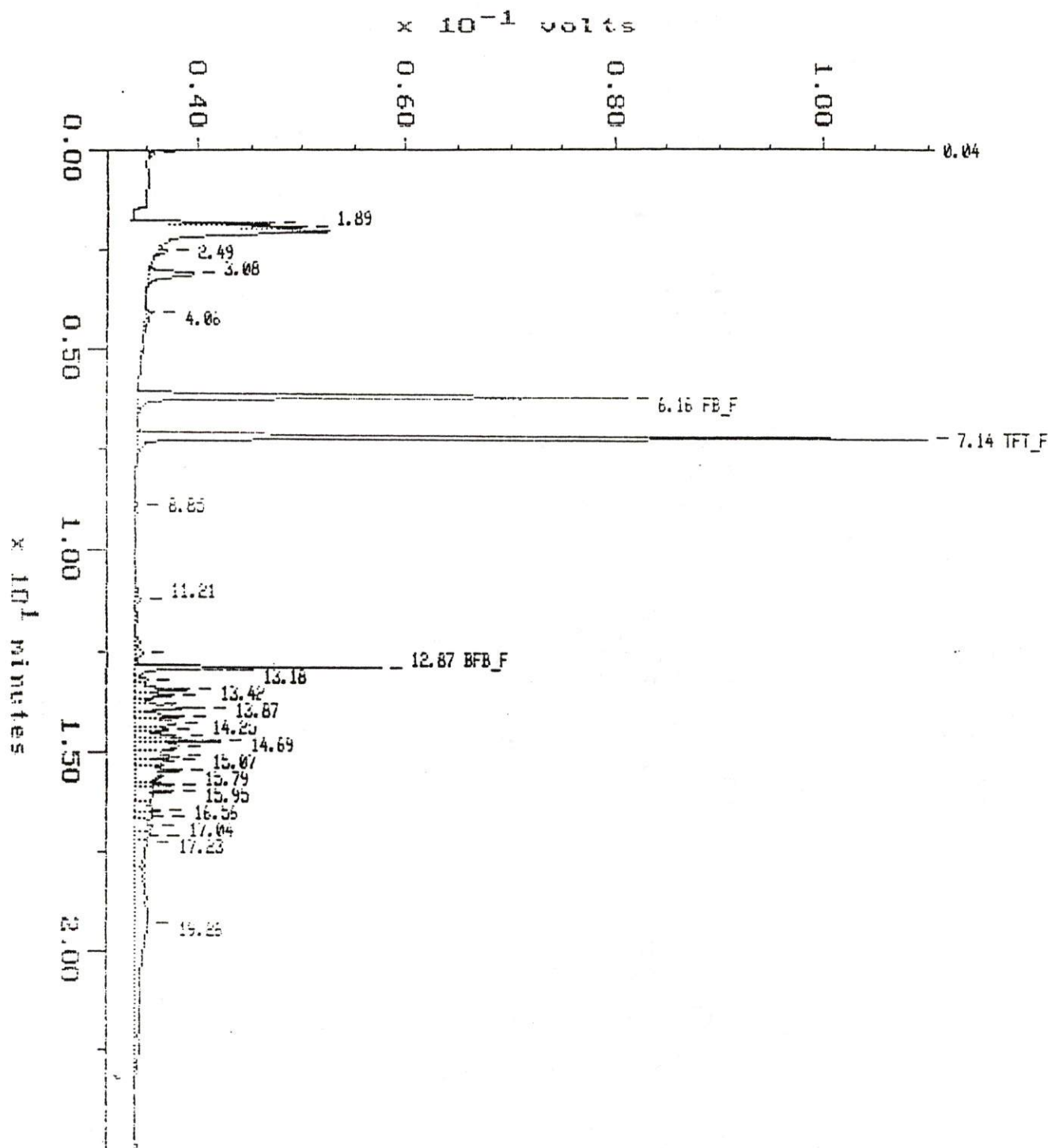


WA DOE WTPH-G

Sample: 9211-177-7
Acquired: 18-NOV-92 15:37

Channel: JEROME-F10
Method: H:\BRU2\MAXDATA\JEROME\J111892A

Filename: 1118JR09
Operator:



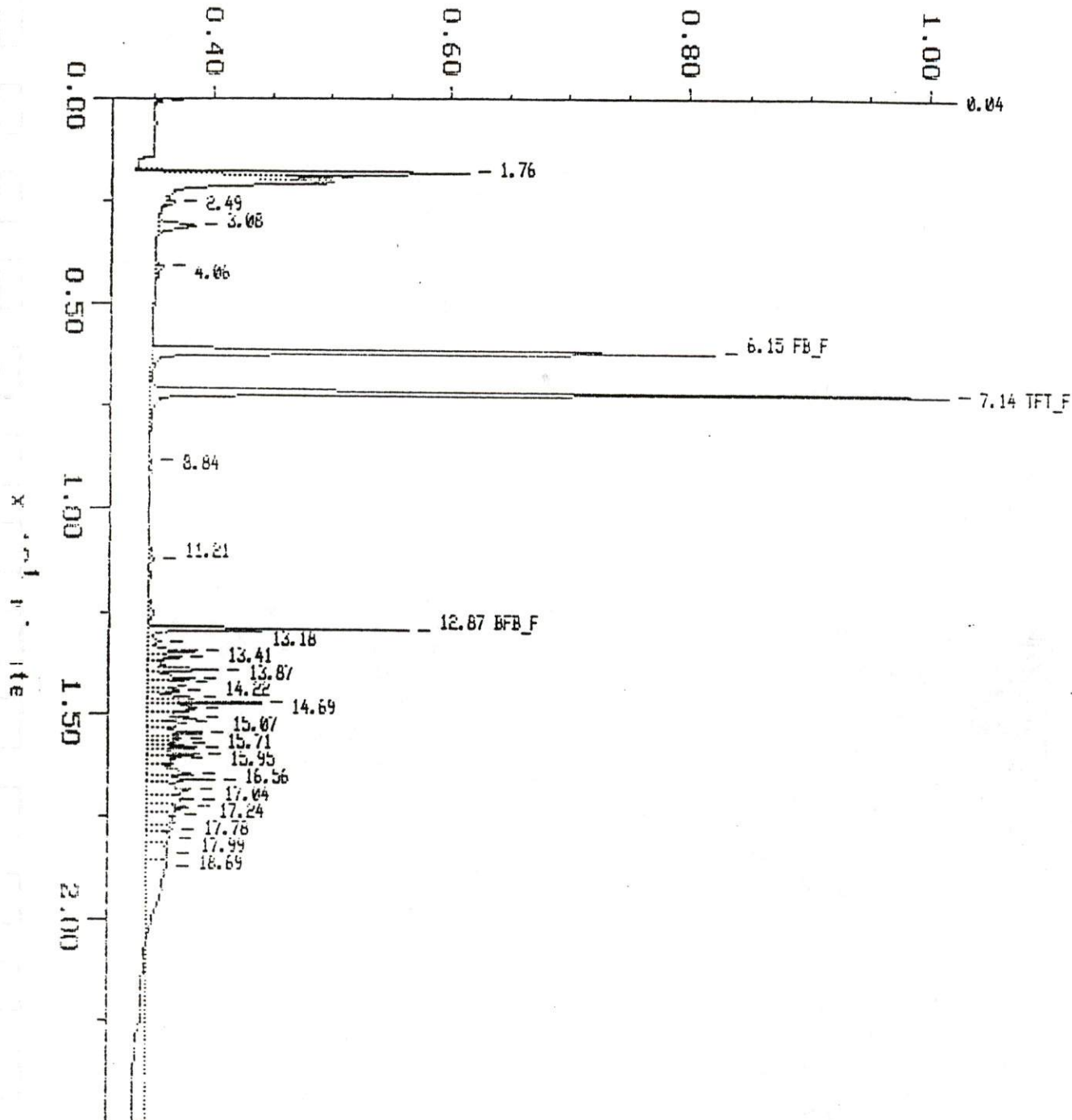
WA DOE WTPH-G

Sample: 9211-177-8
Acquired: 18-NOV-92 16:06

Channel: JEROME-F10
Method: H:\BRU2\MAXDATA\JEROME\J111892A

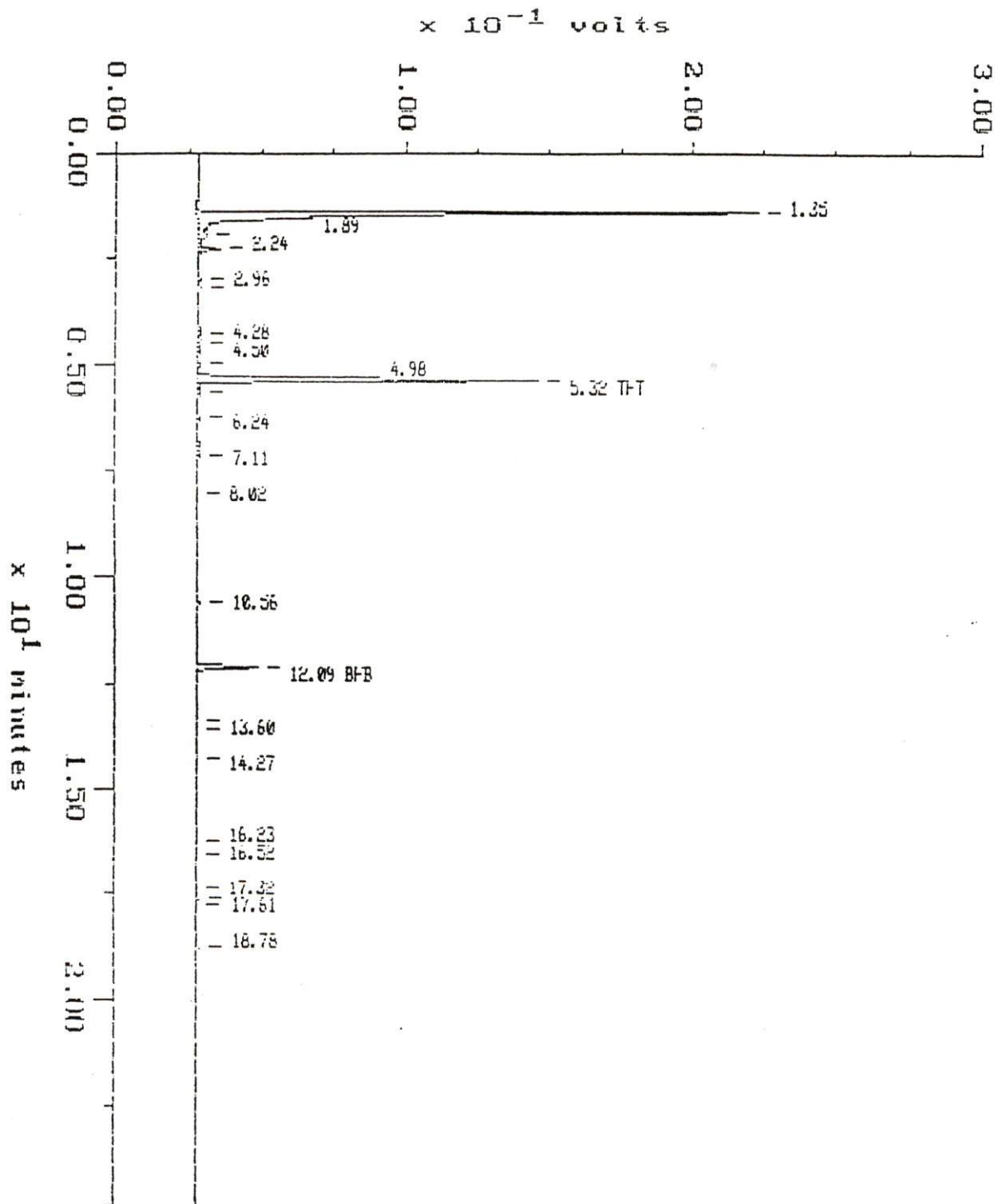
Filename: 1118JR10
Operator:

$\times 10^{-1}$ volts



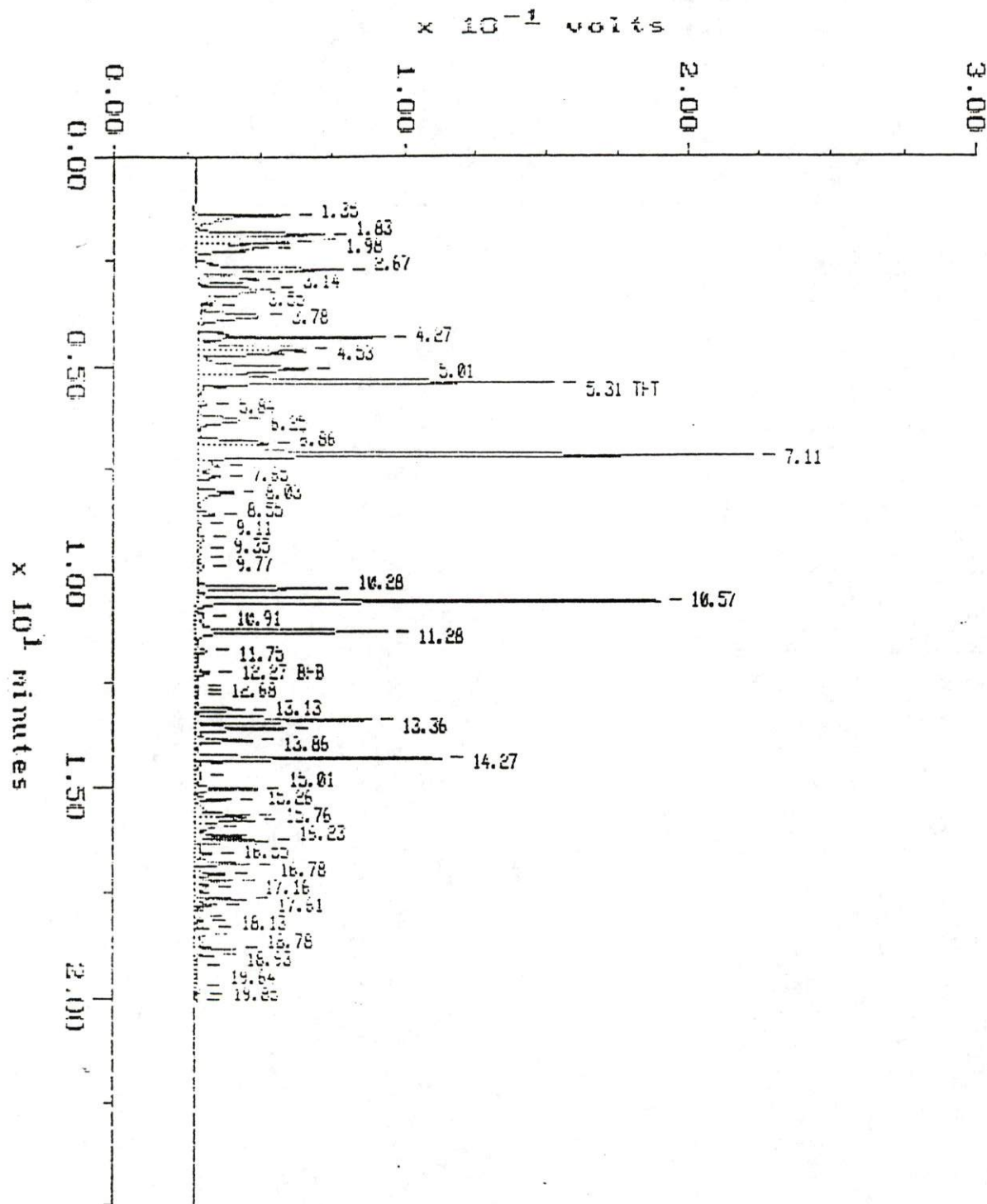
Sample: SK8-A 11/17 Channel: PRISCILLA
 Acquired: 17-NOV-92 21:33 Method: H:\BR02\MAXDATA\ELVIS-PA111792EP
 Comments: ATI FUELS: A MISSION OF EXCELLENCE IN ANALYTICAL CHROMATOGRAPHY.

Filename: 1117EP03
 Operator: AFI



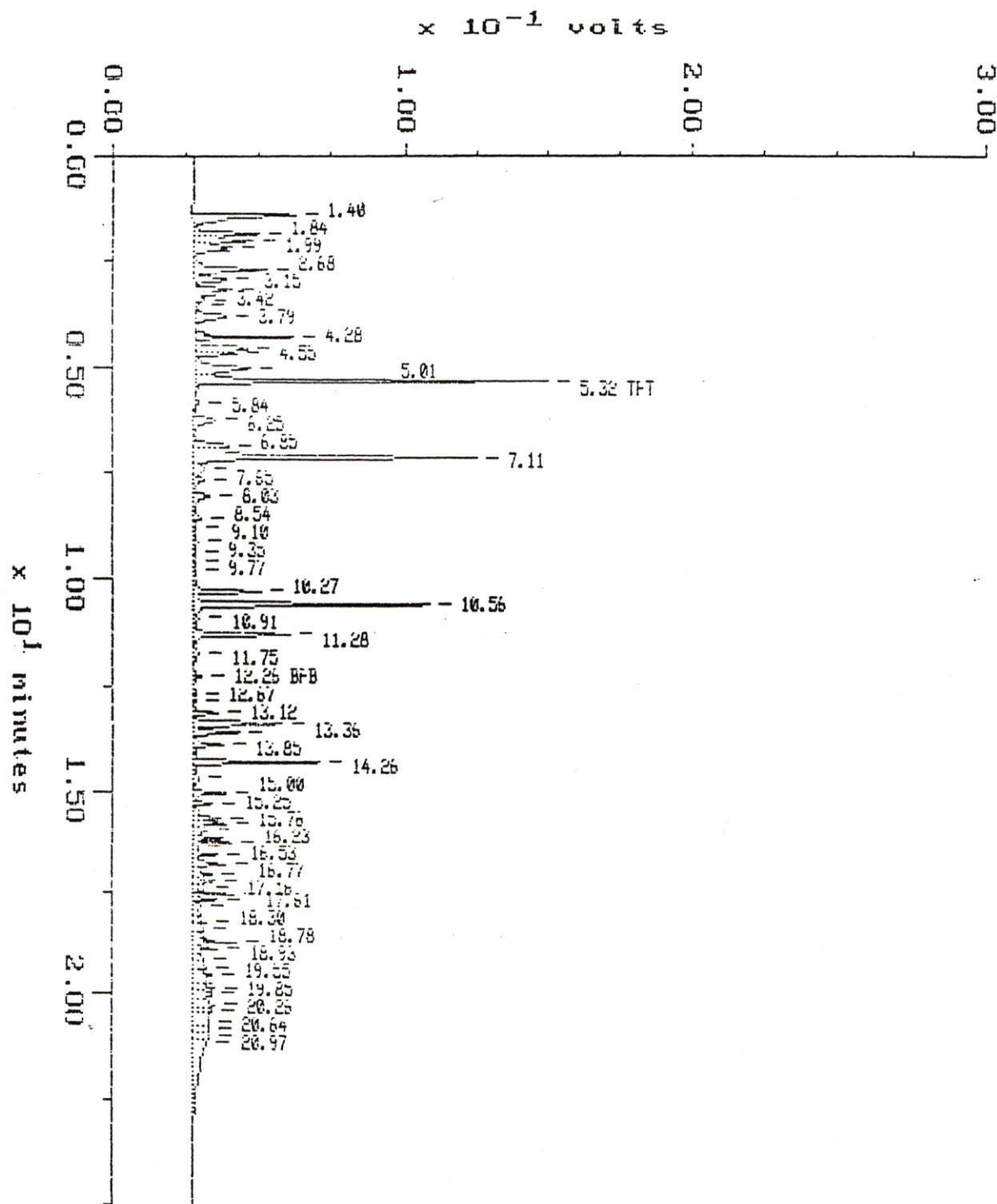
Sample: WMS 11/17 Channel: PRISCILLA
Acquired: 17-NOV-92 13:41 Method: H:\BRO2\MAXDATA\ELVIS-PA\111792EV
Comments: AT1 FUELS: A MISSION OF EXCELLENCE IN ANALYTICAL CHROMATOGRAPHY.

Filename: 1117EP01
Operator: ATI



Sample: std-c 1117 Channel: PRISCILLA
 Acquired: 18-NOV-92 10:25 Method: H:\BROU\MAXDATA\ELVIS-PA\111792EP
 Comments: ATI FUELS: A MISSION OF EXCELLENCE IN ANALYTICAL CHROMATOGRAPHY.

Filename: 111/EP1/
 Operator: ATI



Sample: STD-C GAS

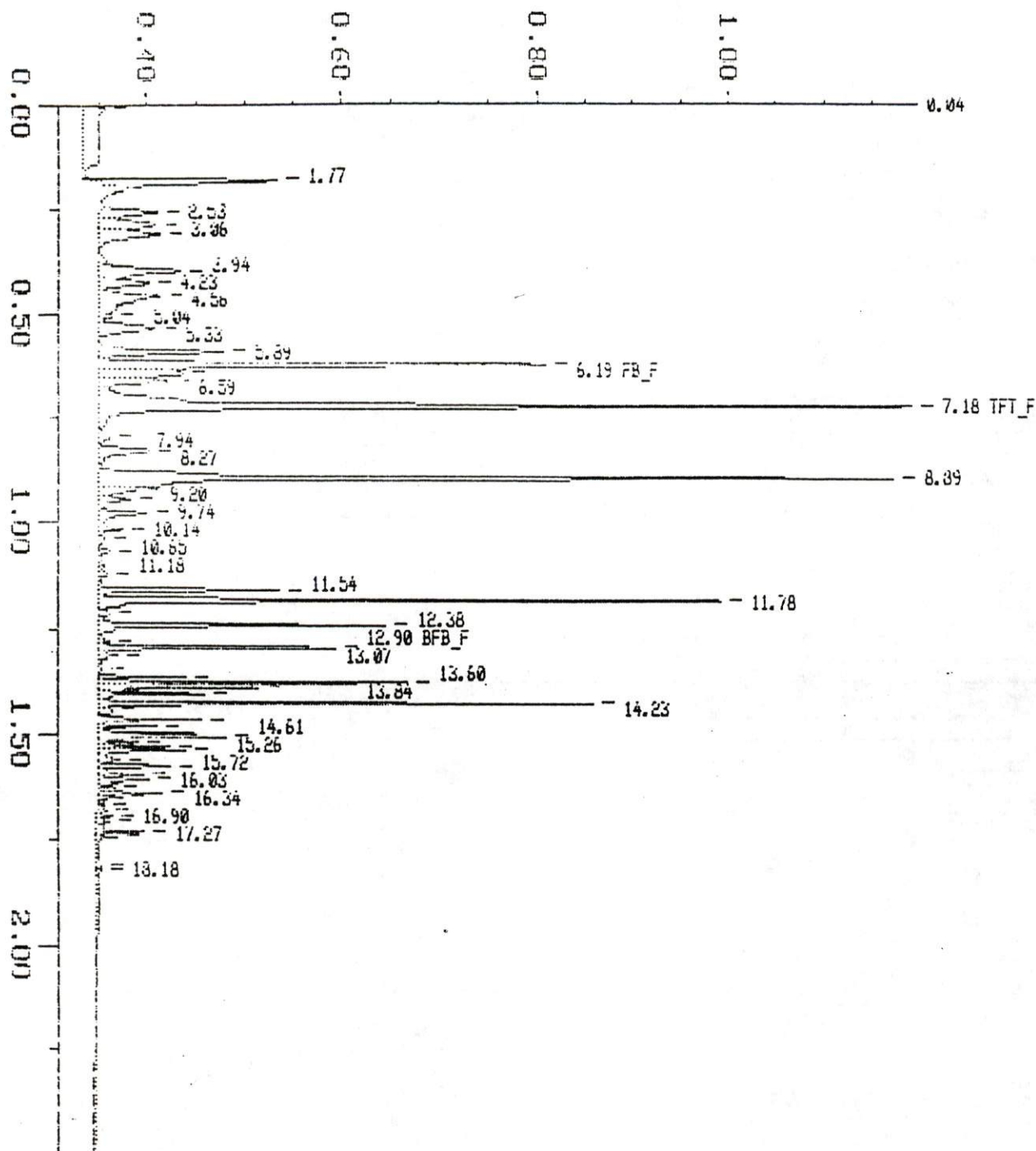
Channel: JEROME-F10

Filename: 1118JR02

Acquired: 18-NOV-92 11:45

Method: H:\BRU2\MAXDATA\JEROME\J111892A

Operator:

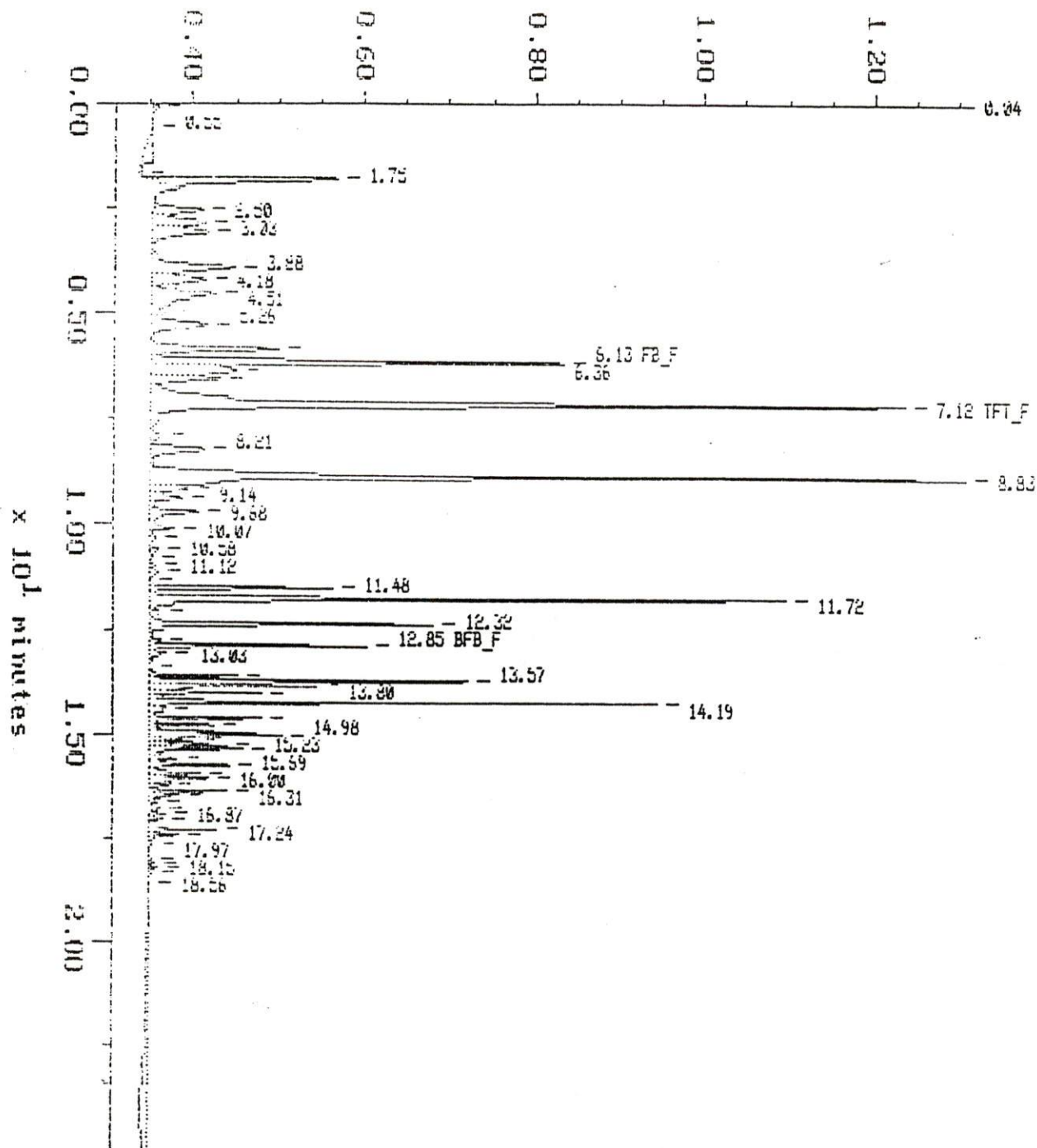
 $\times 10^{-1}$ volts

Sample: STD-C 11/18
Acquired: 19-NOV-92 3:45

Channel: JEROME-F10
Method: H:\BRO2\MAXDATA\JEROME\J111892A

Filename: 1118J024
Operator:

$\times 10^{-1}$ Volts





DATE: 11/16/92

Page 1 of 1

ATI ACCESSION # 9211-177

COMPANY: Gowlingmeyer
 REPORT TO: Kurt Friesz
 ADDRESS: 2410 154th Ave NE
Redmond, WA 98052
 PHONE: (206) 91-1100 FAX: (206) 41-5060
 PROJECT MANAGER: Kurt Friesz
 PROJECT NUMBER: 372-80-R04
 PROJECT NAME: Chevron/Hillstream
 ATI will DISPOSE RETURN samples (circle one)

					FUELS					ORGANIC COMPOUNDS					METALS		TCLP		OTHER																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
					TPH-HCID	WA/OR	BETX/TPH-G combo	WA/OR	BETX (by 8020)	TPH-G	WA/OR	TPH-D	WA/OR	8015 modified	WA/OR	418.1	413.2	AK-GRO	AK-DRO	8240 GCMS Volatiles	8270 GCMS Semivolatiles	8080 Pesticides/PCBs	PCB only (by 8080) STD/lo level	8010 Halogenated VOCs	8020 Aromatic VOCs	8310 HPLC PAHs	8040 Phenols	8140 OP Pesticides	8150 OC Herbicides	Metals (Indicate below *)	Total Lead	Priority Pollutant Metals (13)	TAL Metals (23)	TCLP-Volatiles (ZHE-8240)	TCLP-Semivolatiles (8270)	TCLP-Pesticides (8080)	TCLP-Herbicides (8150)	TCLP-Metals (8 metals)	% Moisture (please indicate)	Total # of Containers/sample																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
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Turnaround Time		Sample Receipt		Relinquished By:		Relinquished By:		Relinquished By:	
STANDARD TAT		TOTAL # CONTAINERS RECD	16	Date:	11/17/92	Date:		Date:	
1 WEEK TAT		COC SEALS PRESENT?	4	Time:	8:00	Time:		Time:	
4 WORK DAY TAT		COC SEALS INTACT?	4	Received By:		Received By:		Received By:	
3 WORK DAY TAT		RECEIVED COLD?	4	Date:	11/17/92	Date:		Date:	
2 WORK DAY TAT		RECEIVED INTACT?	4	Time:	10:50	Time:		Time:	
24 HOUR TAT	X	RECEIVED VIA:	Chevron						

Special Instructions:
 Run BETX of WTPH-G concentrations and
 1335 then 100 mg/kg (Run 24 TAT)
 * Metals needed:



Analytical**Technologies, Inc.**

560 Naches Avenue, S.W., Suite 101, Renton, WA 98055 (206) 228-8335
John H. Taylor, Jr., Laboratory Manager
Frederick W. Grothkopp, Technical Director

ATI I.D. # 9211-251

GeoEngineers

December 28, 1992

DEC 28 1992

Routing

File

GeoEngineers, Inc.
8410 154th Avenue N.E.
Redmond, WA 98052

Attention : Kurt Fraese

Project Number : 0372-080-R04

Project Name : Chevron - Bellingham

On November 25, 1992, Analytical Technologies, Inc., received five samples for analysis. The samples were analyzed with EPA methodology or equivalent methods as specified in the attached analytical schedule. The results, sample cross reference, and quality control data was issued on December 14, 1992.

Enclosed are the amended pages to the report previously issued. Please replace the original pages with these updates. We apologize for any inconvenience this may have caused.


Donna M. McKinney
Senior Project Manager

DMM/hal/ff



Analytical Technologies, Inc.

560 Naches Avenue, S.W., Suite 101, Renton, WA 98055 (206) 228-8335
John H. Taylor, Jr., Laboratory Manager
Frederick W. Grothkopp, Technical Director

ATI I.D. # 9211-251

December 14, 1992

GeoEngineers

DEC 15 1992

GeoEngineers, Inc.
110 154th Avenue N.E.
Edmond, WA 98052

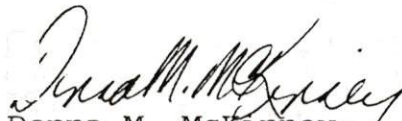
Routing ☒ ☒ ☒
File ☐ ☐ ☐

Attention : Kurt Fraese

Project Number : 0372-080-R04

Project Name : Chevron - Bellingham

On November 25, 1992, Analytical Technologies, Inc., received five samples for analysis. The samples were analyzed with EPA methodology or equivalent methods as specified in the attached analytical schedule. The results, sample cross reference, and quality control data are enclosed.


Donna M. McKinney
Senior Project Manager

DMM/hal/ff

ATI I.D. # 9211-251

SAMPLE CROSS REFERENCE SHEET

CLIENT : GEOENGINEERS, INC.
PROJECT # : 0372-080-R04
PROJECT NAME : CHEVRON - BELLINGHAM

ATI #	CLIENT DESCRIPTION	DATE SAMPLED	MATRIX
9211-251-1	921125-G26	11/25/92	SOIL
9211-251-2	921125-G27	11/25/92	SOIL
9211-251-3	921125-G28	11/25/92	SOIL
9211-251-4	921125-G29	11/25/92	SOIL
9211-251-5	921125-7	11/25/92	SOIL

----- TOTALS -----

MATRIX	# SAMPLES
SOIL	5

ATI STANDARD DISPOSAL PRACTICE

The samples from this project will be disposed of in thirty (30) days from the date of the report. If an extended storage period is required, please contact our sample control department before the scheduled disposal date.

ATI I.D. # 9211-251

ANALYTICAL SCHEDULE

CLIENT : GEOENGINEERS, INC.
PROJECT # : 0372-080-R04
PROJECT NAME : CHEVRON - BELLINGHAM

ANALYSIS	TECHNIQUE	REFERENCE	LAB
TX	GC/PID	EPA 8020	R
HYDROCARBON IDENTIFICATION	GC/FID	WA DOE WTPH-HCID	R
TOTAL PETROLEUM HYDROCARBONS	GC/FID	WA DOE WTPH-G	R
PETROLEUM HYDROCARBONS	IR	WA DOE WTPH-418.1 MODIFIED	R
DISTURE	GRAVIMETRIC	CLP SOW ILM01.0	R

-- = ATI - Renton
SD = ATI - San Diego
IX = ATI - Phoenix
JR = ATI - Pensacola
FC = ATI - Fort Collins
CJB = Subcontract

ATI I.D. # 9211-251

QUALITY CONTROL
INFORMATION

CLIENT : GEOENGINEERS, INC.
PROJECT # : 0372-080-R04
PROJECT NAME : CHEVRON - BELLINGHAM

BETX

DETECTION LIMITS

	WATER	SOIL
Benzene	0.0005 mg/L	0.025 mg/Kg
Toluene	0.0005 mg/L	0.025 mg/Kg
Ethyl Benzene	0.0005 mg/L	0.025 mg/Kg
Xylenes	0.0005 mg/L	0.025 mg/Kg

CONTROL LIMITS

BLANK SPIKE	WATER	RPD	SOIL	RPD
Benzene	80-111	20	63-115	20
Toluene	78-111	20	75-110	20
Xylenes	80-114	20	79-109	20
MATRIX SPIKE	WATER	RPD	SOIL	RPD
Benzene	77-112	20	35-113	20
Toluene	72-113	20	43-107	20
Xylenes	80-110	20	46-114	20

WA DOE WTPH-G

DETECTION LIMITS

	WATER	SOIL
Gasoline	0.1 mg/L	5 mg/Kg

CONTROL LIMITS

BLANK SPIKE	WATER	RPD	SOIL	RPD
Gasoline	75-120	20	80-119	20
MATRIX SPIKE	WATER	RPD	SOIL	RPD
Gasoline	58-127	20	50-112	20

CONTINUED ON NEXT PAGE



ATI I.D. # 9211-251

QUALITY CONTROL
INFORMATION
CONTINUED

CLIENT : GEOENGINEERS, INC.
PROJECT # : 0372-080-R04
PROJECT NAME : CHEVRON - BELLINGHAM

WTPH 418.1 Modified

DETECTION LIMITS

COMPOUND	WATER	SOIL
Petroleum Hydrocarbon	1 mg/L	20 mg/Kg

CONTROL LIMITS

	WATER	RPD	SOIL	RPD
BLANK SPIKE Petroleum Hydrocarbons	51-104	20	96-144	20
MATRIX DUPLICATE Petroleum Hydrocarbons	-	35	-	35
MATRIX SPIKE Fuel Hydrocarbons	40-121	35	45-187	35

ATI I.D. # 9211-251

VOLATILE ORGANIC COMPOUNDS
DATA SUMMARY

CLIENT	: GEOENGINEERS, INC.	DATE SAMPLED	: N/A
PROJECT #	: 0372-080-R04	DATE RECEIVED	: N/A
PROJECT NAME	: CHEVRON - BELLINGHAM	DATE EXTRACTED	: 11/30/92
CLIENT I.D.	: METHOD BLANK	DATE ANALYZED	: 11/30/92
SAMPLE MATRIX	: SOIL	UNITS	: mg/Kg
EPA METHOD	: 8020 (BETX)	DILUTION FACTOR	: 1

RESULTS ARE CORRECTED FOR MOISTURE CONTENT

COMPOUND	MDL	RESULT
BENZENE	0.025	ND
ETHYLBENZENE	0.025	ND
TOLUENE	0.025	ND
TOTAL XYLENES	0.025	ND

SURROGATE PERCENT RECOVERY

BROMOFLUOROBENZENE	98
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ATI I.D. # 9211-251

VOLATILE ORGANIC COMPOUNDS
DATA SUMMARY

CLIENT : GEOENGINEERS, INC.
PROJECT # : 0372-080-R04
PROJECT NAME : CHEVRON - BELLINGHAM
CLIENT I.D. : METHOD BLANK
SAMPLE MATRIX : SOIL
EPA METHOD : 8020 (BETX)
RESULTS ARE CORRECTED FOR MOISTURE CONTENT

DATE SAMPLED : N/A
DATE RECEIVED : N/A
DATE EXTRACTED : 12/02/92
DATE ANALYZED : 12/02/92
UNITS : mg/Kg
DILUTION FACTOR : 1

COMPOUND	MDL	RESULT
BENZENE	0.025	ND
ETHYLBENZENE	0.025	ND
TOLUENE	0.025	ND
OTAL XYLENES	0.025	ND

SURROGATE PERCENT RECOVERY

BROMOFLUOROBENZENE 98

ATI I.D. # 9211-251-1

VOLATILE ORGANIC COMPOUNDS
DATA SUMMARY

CLIENT	: GEOENGINEERS, INC.	DATE SAMPLED	: 11/25/92
PROJECT #	: 0372-080-R04	DATE RECEIVED	: 11/25/92
PROJECT NAME	: CHEVRON - BELLINGHAM	DATE EXTRACTED	: 12/02/92
CLIENT I.D.	: 921125-G26	DATE ANALYZED	: 12/02/92
SAMPLE MATRIX	: SOIL	UNITS	: mg/Kg
EPA METHOD	: 8020 (BETX)	DILUTION FACTOR	: 1

RESULTS ARE CORRECTED FOR MOISTURE CONTENT

COMPOUND	MDL	RESULT
BENZENE	0.030	0.042
ETHYLBENZENE	0.030	1.1
TOLUENE	0.030	0.13
TOTAL XYLENES	0.030	3.3

SURROGATE PERCENT RECOVERY

BROMOFLUOROBENZENE	95
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ATI I.D. # 9211-251-3

VOLATILE ORGANIC COMPOUNDS
DATA SUMMARY

CLIENT : GEOENGINEERS, INC.
PROJECT # : 0372-080-R04
PROJECT NAME : CHEVRON - BELLINGHAM
CLIENT I.D. : 921125-G28
SAMPLE MATRIX : SOIL
EPA METHOD : 8020 (BETX)
RESULTS ARE CORRECTED FOR MOISTURE CONTENT

DATE SAMPLED : 11/25/92
DATE RECEIVED : 11/25/92
DATE EXTRACTED : 11/30/92
DATE ANALYZED : 12/01/92
UNITS : mg/Kg
DILUTION FACTOR : 1

COMPOUND	MDL	RESULT
BENZENE	0.031	ND
ETHYLBENZENE	0.031	ND
TOLUENE	0.031	ND
TOTAL XYLENES	0.031	ND

SURROGATE PERCENT RECOVERY

BROMOFLUOROBENZENE

76

ATI I.D. # 9211-251-4

VOLATILE ORGANIC COMPOUNDS
DATA SUMMARY

CLIENT : GEOENGINEERS, INC.
PROJECT # : 0372-080-R04
PROJECT NAME : CHEVRON - BELLINGHAM
CLIENT I.D. : 921125-G29
SAMPLE MATRIX : SOIL
EPA METHOD : 8020 (BETX)
RESULTS ARE CORRECTED FOR MOISTURE CONTENT

DATE SAMPLED : 11/25/92
DATE RECEIVED : 11/25/92
DATE EXTRACTED : 11/30/92
DATE ANALYZED : 12/01/92
UNITS : mg/Kg
DILUTION FACTOR : 1

COMPOUND	MDL	RESULT
BENZENE	0.032	ND
ETHYLBENZENE	0.032	ND
TOLUENE	0.032	ND
TOTAL XYLENES	0.032	ND

SURROGATE PERCENT RECOVERY

BROMOFLUOROBENZENE 88



ATI I.D. # 9211-251-5

VOLATILE ORGANIC COMPOUNDS
DATA SUMMARY

CLIENT	: GEOENGINEERS, INC.	DATE SAMPLED	: 11/25/92
PROJECT #	: 0372-080-R04	DATE RECEIVED	: 11/25/92
PROJECT NAME	: CHEVRON - BELLINGHAM	DATE EXTRACTED	: 12/02/92
CLIENT I.D.	: 921125-7	DATE ANALYZED	: 12/02/92
SAMPLE MATRIX	: SOIL	UNITS	: mg/Kg
LAB METHOD	: 8020 (BETX)	DILUTION FACTOR	: 1
RESULTS ARE CORRECTED FOR MOISTURE CONTENT			

COMPOUND	MDL	RESULT
BENZENE	0.029	ND
ETHYLBENZENE	0.029	0.051
TOLUENE	0.029	ND
PARA XYLENES	0.029	0.46

SURROGATE PERCENT RECOVERY

BROMOFLUOROBENZENE	86
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ATI I.D. # 9211-251

VOLATILE ORGANIC COMPOUNDS
QUALITY CONTROL DATA

CLIENT : GEOENGINEERS, INC.
PROJECT # : 0372-080-R04
PROJECT NAME : CHEVRON - BELLINGHAM
EPA METHOD : 8020 (BETX)

SAMPLE I.D. : 9211-245-14
DATE EXTRACTED : 11/30/92
DATE ANALYZED : 11/30/92
MATRIX : SOIL
UNITS : mg/Kg

COMPOUND	SAMPLE RESULT	SPIKE ADDED	SPIKED SAMPLE	% REC	DUP SPIKED SAMPLE	DUP % REC	RPD
BENZENE	ND	1.00	0.494	49	0.581	58	16
TOLUENE	ND	1.00	0.642	64	0.669	67	4
TOTAL XYLENES	ND	2.00	1.50	75	1.50	75	0

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative \% Difference)} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 100$$



ATI I.D. # 9211-251

VOLATILE ORGANIC COMPOUNDS
QUALITY CONTROL DATA

CLIENT : GEOENGINEERS, INC.
PROJECT # : 0372-080-R04
PROJECT NAME : CHEVRON - BELLINGHAM
EPA METHOD : 8020 (BETX)

SAMPLE I.D. : 9211-251-5
DATE EXTRACTED : 12/02/92
DATE ANALYZED : 12/02/92
MATRIX : SOIL
UNITS : mg/Kg

COMPOUND	SAMPLE RESULT	SPIKE ADDED	SPIKED SAMPLE	% REC	DUP SPIKED SAMPLE	DUP % REC	RPD
BENZENE	ND	1.00	0.861	86	0.794	79	8
TOLUENE	ND	1.00	0.954	95	0.893	89	7
TOTAL XYLENES	0.396	2.00	2.35	98	2.13	87	10

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\% \text{D (Relative \% Difference)} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 100$$

ATI I.D. # 9211-251

VOLATILE ORGANIC COMPOUNDS
QUALITY CONTROL DATA

CLIENT : GEOENGINEERS, INC.
PROJECT # : 0372-080-R04
PROJECT NAME : CHEVRON - BELLINGHAM
EPA METHOD : 8020 (BETX)

SAMPLE I.D. : BLANK SPIKE
DATE EXTRACTED : 11/30/92
DATE ANALYZED : 11/30/92
MATRIX : SOIL
UNITS : mg/Kg

COMPOUND	SAMPLE RESULT	SPIKE ADDED	SPIKED SAMPLE	% REC	DUP SPIKED SAMPLE	DUP % REC	RPD
BENZENE	ND	1.00	0.861	86	0.869	87	1
TOLUENE	ND	1.00	0.902	90	0.948	95	5
TOTAL XYLENES	ND	2.00	1.85	93	1.92	96	4

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative \% Difference)} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 100$$

ATI I.D. # 9211-251

VOLATILE ORGANIC COMPOUNDS
QUALITY CONTROL DATA

CLIENT : GEOENGINEERS, INC.
PROJECT # : 0372-080-R04
PROJECT NAME : CHEVRON - BELLINGHAM
EPA METHOD : 8020 (BETX)

SAMPLE I.D. : BLANK SPIKE
DATE EXTRACTED : 12/02/92
DATE ANALYZED : 12/02/92
MATRIX : SOIL
UNITS : mg/Kg

COMPOUND	SAMPLE RESULT	SPIKE ADDED	SPIKED SAMPLE	% REC	DUP SPIKED SAMPLE	DUP % REC	RPD
BENZENE	ND	1.00	0.868	87	0.861	86	1
TOLUENE	ND	1.00	0.920	92	0.913	91	1
OTAL XYLENES	ND	2.00	1.87	94	1.91	96	2

$$\text{Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{PD (Relative \% Difference)} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 100$$

ATI I.D. # 9211-251

HYDROCARBON IDENTIFICATION
DATA SUMMARY

CLIENT	: GEOENGINEERS, INC.	DATE SAMPLED	: N/A
PROJECT #	: 0372-080-R04	DATE RECEIVED	: N/A
PROJECT NAME	: CHEVRON - BELLINGHAM	DATE EXTRACTED	: 11/30/92
CLIENT I.D.	: METHOD BLANK	DATE ANALYZED	: 11/30/92
SAMPLE MATRIX	: SOIL	DILUTION FACTOR	: 1
METHOD	: WA DOE WTPH-HCID		
RESULTS ARE CORRECTED FOR MOISTURE CONTENT			

RESULT

GASOLINE CONCENTRATION LESS THAN 20 mg/Kg BY WA DOE WTPH-HCID.

DIESEL CONCENTRATION LESS THAN 50 mg/Kg BY WA DOE WTPH-HCID.

PETROLEUM HYDROCARBONS >C24 CONCENTRATION LESS THAN 100 mg/Kg BY WA DOE WTPH-HCID.

SURROGATE PERCENT RECOVERY

O-TERPHENYL

60



ATI I.D. # 9211-251-1

HYDROCARBON IDENTIFICATION
DATA SUMMARY

CLIENT	: GEOENGINEERS, INC.	DATE SAMPLED	: 11/25/92
PROJECT #	: 0372-080-R04	DATE RECEIVED	: 11/25/92
PROJECT NAME	: CHEVRON - BELLINGHAM	DATE EXTRACTED	: 11/30/92
CLIENT I.D.	: 921125-G26	DATE ANALYZED	: 12/01/92
SAMPLE MATRIX	: SOIL	DILUTION FACTOR	: 1
METHOD	: WA DOE WTPH-HCID		
RESULTS ARE CORRECTED FOR MOISTURE CONTENT			

RESULT

GASOLINE QUALITATIVELY IDENTIFIED BY WA DOE WTPH-HCID.

DIESEL QUALITATIVELY IDENTIFIED BY WA DOE WTPH-HCID.

PETROLEUM HYDROCARBONS >C24 QUALITATIVELY IDENTIFIED BY WA DOE WTPH-HCID.

SURROGATE PERCENT RECOVERY

TERPHENYL

104

ATI I.D. # 9211-251-2

HYDROCARBON IDENTIFICATION
DATA SUMMARY

CLIENT	: GEOENGINEERS, INC.	DATE SAMPLED	: 11/25/92
PROJECT #	: 0372-080-R04	DATE RECEIVED	: 11/25/92
PROJECT NAME	: CHEVRON - BELLINGHAM	DATE EXTRACTED	: 11/30/92
CLIENT I.D.	: 921125-G27	DATE ANALYZED	: 11/30/92
SAMPLE MATRIX	: SOIL	DILUTION FACTOR	: 1
METHOD	: WA DOE WTPH-HCID		
RESULTS ARE CORRECTED FOR MOISTURE CONTENT			

RESULT

GASOLINE CONCENTRATION LESS THAN 20 mg/Kg BY WA DOE WTPH-HCID.

DIESEL CONCENTRATION LESS THAN 50 mg/Kg BY WA DOE WTPH-HCID.

PETROLEUM HYDROCARBONS >C24 CONCENTRATION LESS THAN 100 mg/Kg BY WA DOE WTPH-HCID.

SURROGATE PERCENT RECOVERY

O-TERPHENYL

62

ATI I.D. # 9211-251-5

HYDROCARBON IDENTIFICATION
DATA SUMMARY

CLIENT	: GEOENGINEERS, INC.	DATE SAMPLED	: 11/25/92
PROJECT #	: 0372-080-R04	DATE RECEIVED	: 11/25/92
PROJECT NAME	: CHEVRON - BELLINGHAM	DATE EXTRACTED	: 11/30/92
CLIENT I.D.	: 921125-7	DATE ANALYZED	: 12/01/92
SAMPLE MATRIX	: SOIL	DILUTION FACTOR	: 1
METHOD	: WA DOE WTPH-HCID		
RESULTS ARE CORRECTED FOR MOISTURE CONTENT			

RESULT

ASOLINE QUALITATIVELY IDENTIFIED BY WA DOE WTPH-HCID.

DIESEL QUALITATIVELY IDENTIFIED BY WA DOE WTPH-HCID.

PETROLEUM HYDROCARBONS >C24 QUALITATIVELY IDENTIFIED BY WA DOE WTPH-HCID.

SURROGATE PERCENT RECOVERY

-TERPHENYL

111

ATI I.D. # 9211-251

HYDROCARBON IDENTIFICATION ANALYSIS
CONTINUING CALIBRATION STANDARDS SUMMARY

CLIENT	: GEOENGINEERS, INC.	DATE SAMPLED	: N/A
PROJECT #	: 0372-080-R04	DATE RECEIVED	: N/A
PROJECT NAME	: CHEVRON - BELLINGHAM	DATE EXTRACTED	: N/A
CLIENT I.D.	: 400 PPM CCV	DATE ANALYZED	: 11/30/92
SAMPLE MATRIX	: WATER	UNITS	: %
METHOD	: WA DOE WTPH-HCID	DILUTION FACTOR	: 1

COMPOUND	% DIFFERENCE
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FUEL HYDROCARBONS QUANTITATED USING GASOLINE	6
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FUEL HYDROCARBONS QUANTITATED USING DIESEL	3
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ATI I D. # 9211-251

HYDROCARBON IDENTIFICATION
QUALITY CONTROL DATA

CLIENT : GEOENGINEERS, INC. SAMPLE I.D. # : 9211-251-2
PROJECT # : 0372-080-R04 DATE EXTRACTED : 11/30/92
PROJECT NAME : CHEVRON - BELLINGHAM DATE ANALYZED : 11/30/92
METHOD : WA DOE WTPH-HCID UNITS : mg/Kg
SAMPLE MATRIX : SOIL

COMPOUND	SAMPLE RESULT	SAMPLE DUP. RESULT		RPD	SPIKE ADDED	SPIKED RESULT	% REC.	DUP. SPIKED		RPD
								RESULT	% REC.	
SOLINE	ND	ND	NC	N/A	N/A	N/A	N/A	N/A	N/A	N/A
DIESEL	ND	ND	NC	N/A	N/A	N/A	N/A	N/A	N/A	N/A

ND = Not Calculable.

$$\text{Recovery} = \frac{(\text{Spiked Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RD (Relative \% Difference)} = \frac{|(\text{Spike Result} - \text{Dup. Spike Result})|}{\text{Average Result}} \times 100$$

ATI I.D. # 9211-251

HYDROCARBON IDENTIFICATION
QUALITY CONTROL DATA

CLIENT : GEOENGINEERS, INC.	SAMPLE I.D. # : BLANK SPIKE
PROJECT # : 0372-080-R04	DATE EXTRACTED : 11/30/92
PROJECT NAME : CHEVRON - BELLINGHAM	DATE ANALYZED : 11/30/92
METHOD : WA DOE WTPH-HCID	UNITS : mg/Kg
SAMPLE MATRIX : SOIL	

COMPOUND	SAMPLE RESULT	SPIKE ADDED	SPIKED RESULT	% REC.	DUP. SPIKED RESULT	DUP. % REC.	RPD
DIESEL	ND	500	490	98	494	99	1

$$\% \text{ Recovery} = \frac{(\text{Spiked Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative \% Difference)} = \frac{|(\text{Spike Result} - \text{Dup. Spike Result})|}{\text{Average Result}} \times 100$$



ATI I.D. # 9211-251

TOTAL PETROLEUM HYDROCARBON ANALYSIS
DATA SUMMARY

CLIENT : GEOENGINEERS, INC.
PROJECT # : 0372-080-R04
PROJECT NAME : CHEVRON - BELLINGHAM
CLIENT I.D. : METHOD BLANK
SAMPLE MATRIX : SOIL
METHOD : WA DOE WTPH-G
RESULTS ARE CORRECTED FOR MOISTURE CONTENT

DATE SAMPLED : N/A
DATE RECEIVED : N/A
DATE EXTRACTED : 11/30/92
DATE ANALYZED : 11/30/92
UNITS : mg/Kg
DILUTION FACTOR : 1

COMPOUND	MDL	RESULT
HEXEL HYDROCARBONS	5	ND
HYDROCARBON RANGE		TOLUENE TO DODECANE
HYDROCARBON QUANTITATION USING		GASOLINE

SURROGATE PERCENT RECOVERY

TRIFLUOROTOLUENE	89
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ATI I.D. # 9211-251

TOTAL PETROLEUM HYDROCARBON ANALYSIS
DATA SUMMARY

CLIENT	: GEOENGINEERS, INC.	DATE SAMPLED	: N/A
PROJECT #	: 0372-080-R04	DATE RECEIVED	: N/A
PROJECT NAME	: CHEVRON - BELLINGHAM	DATE EXTRACTED	: 12/02/92
CLIENT I.D.	: METHOD BLANK	DATE ANALYZED	: 12/02/92
SAMPLE MATRIX	: SOIL	UNITS	: mg/Kg
METHOD	: WA DOE WTPH-G	DILUTION FACTOR	: 1
RESULTS ARE CORRECTED FOR MOISTURE CONTENT			

COMPOUND	MDL	RESULT
FUEL HYDROCARBONS	5	ND
HYDROCARBON RANGE		TOLUENE TO DODECANE
HYDROCARBON QUANTITATION USING		GASOLINE

SURROGATE PERCENT RECOVERY

TRIFLUOROTOLUENE	85
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ATI I.D. # 9211-251-1

TOTAL PETROLEUM HYDROCARBON ANALYSIS
DATA SUMMARY

CLIENT	: GEOENGINEERS, INC.	DATE SAMPLED	: 11/25/92
PROJECT #	: 0372-080-R04	DATE RECEIVED	: 11/25/92
PROJECT NAME	: CHEVRON - BELLINGHAM	DATE EXTRACTED	: 12/02/92
CLIENT I.D.	: 921125-G26	DATE ANALYZED	: 12/02/92
SAMPLE MATRIX	: SOIL	UNITS	: mg/Kg
METHOD	: WA DOE WTPH-G	DILUTION FACTOR	: 1

RESULTS ARE CORRECTED FOR MOISTURE CONTENT

COMPOUND	MDL	RESULT
JEL HYDROCARBONS	6	110
HYDROCARBON RANGE		TOLUENE TO DODECANE
HYDROCARBON QUANTITATION USING		GASOLINE

SURROGATE PERCENT RECOVERY

TRIFLUOROTOLUENE	79
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ATI I.D. # 9211-251-3

TOTAL PETROLEUM HYDROCARBON ANALYSIS
DATA SUMMARY

CLIENT	: GEOENGINEERS, INC.	DATE SAMPLED	: 11/25/92
PROJECT #	: 0372-080-R04	DATE RECEIVED	: 11/25/92
PROJECT NAME	: CHEVRON - BELLINGHAM	DATE EXTRACTED	: 11/30/92
CLIENT I.D.	: 921125-G28	DATE ANALYZED	: 11/30/92
SAMPLE MATRIX	: SOIL	UNITS	: mg/Kg
METHOD	: WA DOE WTPH-G	DILUTION FACTOR	: 1
RESULTS ARE CORRECTED FOR MOISTURE CONTENT			

COMPOUND	MDL	RESULT
FUEL HYDROCARBONS	6	ND
HYDROCARBON RANGE		TOLUENE TO DODECANE
HYDROCARBON QUANTITATION USING		GASOLINE

SURROGATE PERCENT RECOVERY

TRIFLUOROTOLUENE	60
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ATI I.D. # 9211-251-4

TOTAL PETROLEUM HYDROCARBON ANALYSIS
DATA SUMMARY

CLIENT : GEOENGINEERS, INC.
PROJECT # : 0372-080-R04
PROJECT NAME : CHEVRON - BELLINGHAM
CLIENT I.D. : 921125-G29
SAMPLE MATRIX : SOIL
METHOD : WA DOE WTPH-G

DATE SAMPLED : 11/25/92
DATE RECEIVED : 11/25/92
DATE EXTRACTED : 11/30/92
DATE ANALYZED : 11/30/92
UNITS : mg/Kg
DILUTION FACTOR : 1

RESULTS ARE CORRECTED FOR MOISTURE CONTENT

COMPOUND	MDL	RESULT
HEXEL HYDROCARBONS	6	ND
HYDROCARBON RANGE		TOLUENE TO DODECANE
HYDROCARBON QUANTITATION USING		GASOLINE

SURROGATE PERCENT RECOVERY

1,1-DIFLUOROTOLUENE	74
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ATI I.D. # 9211-251-5

TOTAL PETROLEUM HYDROCARBON ANALYSIS
DATA SUMMARY

CLIENT	: GEOENGINEERS, INC.	DATE SAMPLED	: 11/25/92
PROJECT #	: 0372-080-R04	DATE RECEIVED	: 11/25/92
PROJECT NAME	: CHEVRON - BELLINGHAM	DATE EXTRACTED	: 12/02/92
CLIENT I.D.	: 921125-7	DATE ANALYZED	: 12/02/92
SAMPLE MATRIX	: SOIL	UNITS	: mg/Kg
METHOD	: WA DOE WTPH-G	DILUTION FACTOR	: 1
RESULTS ARE CORRECTED FOR MOISTURE CONTENT			

COMPOUND	MDL	RESULT
FUEL HYDROCARBONS	6	83
HYDROCARBON RANGE		TOLUENE TO DODECANE
HYDROCARBON QUANTITATION USING		GASOLINE

SURROGATE PERCENT RECOVERY

TRIFLUOROTOLUENE	80
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ATI I.D. # 9211-251

TOTAL PETROLEUM HYDROCARBON ANALYSIS
QUALITY CONTROL DATA

CLIENT	: GEOENGINEERS, INC.	SAMPLE I.D. #	: 9211-245-14
PROJECT #	: 0372-080-R04	DATE EXTRACTED	: 11/30/92
PROJECT NAME	: CHEVRON - BELLINGHAM	DATE ANALYZED	: 11/30/92
METHOD	: WA DOE WTPH-G	UNITS	: mg/Kg
SAMPLE MATRIX	: SOIL		

COMPOUND	SAMPLE RESULT	SAMPLE DUP. RESULT	RPD	SPIKE ADDED	SPIKED RESULT	% REC.	DUP. SPIKED RESULT	DUP. % REC.	RPD
PETROLEUM HYDROCARBONS (GASOLINE)	ND	ND	NC	100	87.8	88	86.6	87	

NC = Not Calculable.

$$\text{Recovery} = \frac{(\text{Spiked Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative \% Difference)} = \frac{|(\text{Spike Result} - \text{Dup. Spike Result})|}{\text{Average Result}} \times 100$$

ATI I.D. # 9211-251

TOTAL PETROLEUM HYDROCARBON ANALYSIS
QUALITY CONTROL DATA

CLIENT	: GEOENGINEERS, INC.	SAMPLE I.D. #	: 9211-251-5
PROJECT #	: 0372-080-R04	DATE EXTRACTED	: 12/02/92
PROJECT NAME	: CHEVRON - BELLINGHAM	DATE ANALYZED	: 12/02/92
METHOD	: WA DOE WTPH-G	UNITS	: mg/Kg
SAMPLE MATRIX	: SOIL		

COMPOUND	SAMPLE RESULT	SAMPLE DUP. RESULT	RPD	SPIKE ADDED	SPIKED RESULT	% REC.	DUP. SPIKED RESULT	DUP. % REC.	RPD
PETROLEUM HYDROCARBONS (GASOLINE)	72.3	76.4	6	100	156	84	139	67	12

$$\% \text{ Recovery} = \frac{(\text{Spiked Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative \% Difference)} = \frac{|(\text{Spike Result} - \text{Dup. Spike Result})|}{\text{Average Result}} \times 100$$



ATI I.D. # 9211-251

TOTAL PETROLEUM HYDROCARBON ANALYSIS
QUALITY CONTROL DATA

CLIENT : GEOENGINEERS, INC.
PROJECT # : 0372-080-R04
PROJECT NAME : CHEVRON - BELLINGHAM
METHOD : WA DOE WTPH-G
SAMPLE MATRIX : SOIL

SAMPLE I.D. # : BLANK SPIKE
DATE EXTRACTED : 11/30/92
DATE ANALYZED : 11/30/92
UNITS : mg/Kg

COMPOUND	SAMPLE RESULT	SPIKE ADDED	SPIKED RESULT	% REC.	DUP. SPIKED RESULT	DUP. % REC.	RPD
PETROLEUM HYDROCARBONS (GASOLINE)	ND	100	98.3	98	97.3	97	2

$$\text{Recovery} = \frac{(\text{Spiked Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative \% Difference)} = \frac{|(\text{Spike Result} - \text{Dup. Spike Result})|}{\text{Average Result}} \times 100$$

ATI I.D. # 9211-251

TOTAL PETROLEUM HYDROCARBON ANALYSIS
QUALITY CONTROL DATA

CLIENT	: GEOENGINEERS, INC.	SAMPLE I.D. #	: BLANK SPIKE
PROJECT #	: 0372-080-R04	DATE EXTRACTED	: 12/02/92
PROJECT NAME	: CHEVRON - BELLINGHAM	DATE ANALYZED	: 12/02/92
METHOD	: WA DOE WTPH-G	UNITS	: mg/Kg
SAMPLE MATRIX	: SOIL		

COMPOUND	SAMPLE RESULT	SPIKE ADDED	SPIKED RESULT	% REC.	DUP. SPIKED RESULT	DUP. % REC.	RPD
PETROLEUM HYDROCARBONS (GASOLINE)	ND	100	91.4	91	97.4	97	6

$$\% \text{ Recovery} = \frac{(\text{Spiked Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative \% Difference)} = \frac{|(\text{Spike Result} - \text{Dup. Spike Result})|}{\text{Average Result}} \times 100$$

ATI I.D. # 9211-251

TOTAL PETROLEUM HYDROCARBONS
DATA SUMMARY

CLIENT : GEOENGINEERS, INC. DATE EXTRACTED : 12/02/92
PROJECT # : 0372-080-R04 DATE ANALYZED : 12/02/92
PROJECT NAME : CHEVRON - BELLINGHAM UNITS : mg/Kg
METHOD : WA DOE WTPH-418.1 MODIFIED SAMPLE MATRIX : SOIL
RESULTS ARE CORRECTED FOR MOISTURE CONTENT

ATI I.D. #	CLIENT I.D.	MDL	TOTAL PETROLEUM HYDROCARBONS	TOTAL PETROLEUM HYDROCARBONS *
211-251-1	921125-G26	24	5,900	6,000
211-251-5	921125-7	23	7,200	7,100
METHOD BLANK	-	20	ND	ND

Reanalyzed after second aliquot of silica gel added.

ATI I.D. # 9211-251

TOTAL PETROLEUM HYDROCARBONS
QUALITY CONTROL DATA

CLIENT	: GEOENGINEERS, INC.	SAMPLE I D. #	: ICV
PROJECT #	: 0372-080-R04	DATE EXTRACTED	: N/A
PROJECT NAME	: CHEVRON - BELLINGHAM	DATE ANALYZED	: 12/02/92
METHOD	: WA DOE WTPH-418.1 MODIFIED	UNITS	: mg/L
SAMPLE MATRIX	: WATER		

COMPOUND	SAMPLE RESULT	SAMPLE DUP. RESULT	RPD	SPIKE ADDED	SPIKED RESULT	% REC.	DUP. SPIKED RESULT	DUP. % REC.	RPD
PETROLEUM HYDROCARBONS	N/A	N/A	N/A	100	103	103	N/A	N/A	N/A

$$\% \text{ Recovery} = \frac{(\text{Spiked Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative \% Difference)} = \frac{|(\text{Spike Result} - \text{Dup. Spike Result})|}{\text{Average Result}} \times 100$$

ATI I.D. # 9211-251

TOTAL PETROLEUM HYDROCARBONS
QUALITY CONTROL DATA

CLIENT : GEOENGINEERS, INC. SAMPLE I.D. # : 9211-009-1
PROJECT # : 0372-080-R04 DATE EXTRACTED : 12/02/92
PROJECT NAME : CHEVRON - BELLINGHAM DATE ANALYZED : 12/02/92
METHOD : WA DOE WTPH-418.1 MODIFIED UNITS : mg/Kg
SAMPLE MATRIX : SOIL

COMPOUND	SAMPLE RESULT	SAMPLE DUP.		SPIKE ADDED	SPIKED RESULT	% REC.	DUP. SPIKED		DUP. REC.	RPD
		RESULT	RPD				RESULT	%		
PETROLEUM HYDROCARBONS (MOTOR OIL)	90.1	90.5	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A

$$\text{Recovery} = \frac{(\text{Spiked Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative \% Difference)} = \frac{|(\text{Spike Result} - \text{Dup. Spike Result})|}{\text{Average Result}} \times 100$$

ATI I.D. # 9211-251

TOTAL PETROLEUM HYDROCARBONS
QUALITY CONTROL DATA

CLIENT	: GEOENGINEERS, INC.	SAMPLE I.D. #	: 9211-257-9
PROJECT #	: 0372-080-R04	DATE EXTRACTED	: 12/02/92
PROJECT NAME	: CHEVRON - BELLINGHAM	DATE ANALYZED	: 12/02/92
METHOD	: WA DOE WTPH-418.1 MODIFIED	UNITS	: mg/Kg
SAMPLE MATRIX	: SOIL		

COMPOUND	SAMPLE RESULT	SAMPLE DUP. RESULT	RPD	SPIKE ADDED	SPIKED RESULT	% REC.	DUP. SPIKED RESULT	DUP. % REC.	RPD
PETROLEUM HYDROCARBONS (MOTOR OIL)	254	242	5	400	588	84	563	77	8

$$\% \text{ Recovery} = \frac{(\text{Spiked Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative \% Difference)} = \frac{|(\text{Spike Result} - \text{Dup. Spike Result})|}{\text{Average Result}} \times 100$$

ATI I.D. # 9211-251

TOTAL PETROLEUM HYDROCARBONS
QUALITY CONTROL DATA

CLIENT	: GEOENGINEERS, INC.	SAMPLE I.D. #	: BLANK SPIKE
PROJECT #	: 0372-080-R04	DATE EXTRACTED	: 12/02/92
PROJECT NAME	: CHEVRON - BELLINGHAM	DATE ANALYZED	: 12/02/92
METHOD	: WA DOE WTPH-418.1 MODIFIED	UNITS	: mg/Kg
SAMPLE MATRIX	: SOIL		

COMPOUND	SAMPLE RESULT	SAMPLE DUP.		SPIKE ADDED	SPIKED RESULT	% REC.	DUP. SPIKED		RPD
		RESULT	RPD				RESULT	% REC.	
PETROLEUM HYDROCARBONS (MOTOR OIL)	ND	N/A	N/A	400	448	112	392	98	13

$$\text{Recovery} = \frac{(\text{Spiked Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative \% Difference)} = \frac{|(\text{Spike Result} - \text{Dup. Spike Result})|}{\text{Average Result}} \times 100$$

ATI I.D. # 9211-251

GENERAL CHEMISTRY ANALYSIS

CLIENT : GEOENGINEERS, INC.
PROJECT # : 0372-080-R04
PROJECT NAME : CHEVRON - BELLINGHAM

MATRIX : SOIL

PARAMETER DATE ANALYZED

MOISTURE 11/30/92



ATI I.D. # 9211-251

GENERAL CHEMISTRY ANALYSIS
DATA SUMMARY

CLIENT : GEOENGINEERS, INC.
PROJECT # : 0372-080-R04
PROJECT NAME : CHEVRON - BELLINGHAM

MATRIX : SOIL

UNITS : %

ATI I.D. #	CLIENT I.D.	MDL	MOISTURE
9211-251-1	921125-G26	0.5	18
9211-251-2	921125-G27	0.5	21
9211-251-3	921125-G28	0.5	20
9211-251-4	921125-G29	0.5	22
9211-251-5	921125-7	0.5	13

ATI I.D. # 9211-251

GENERAL CHEMISTRY ANALYSIS
QUALITY CONTROL DATA

CLIENT : GEOENGINEERS, INC.
PROJECT # : 0372-080-R04
PROJECT NAME : CHEVRON - BELLINGHAM

MATRIX : SOIL

UNITS : %

PARAMETER	ATI I.D.	SAMPLE RESULT	DUP RESULT	RPD	SPIKED RESULT	SPIKE ADDED	% REC
MOISTURE	9211-251-2	21	22	5	N/A	N/A	N/A
MOISTURE	9211-251-3	20	21	5	N/A	N/A	N/A

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative \% Difference)} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 100$$

WA DOE WTPH-HCID

Sample: 9211-251-1

Channel: WILMA

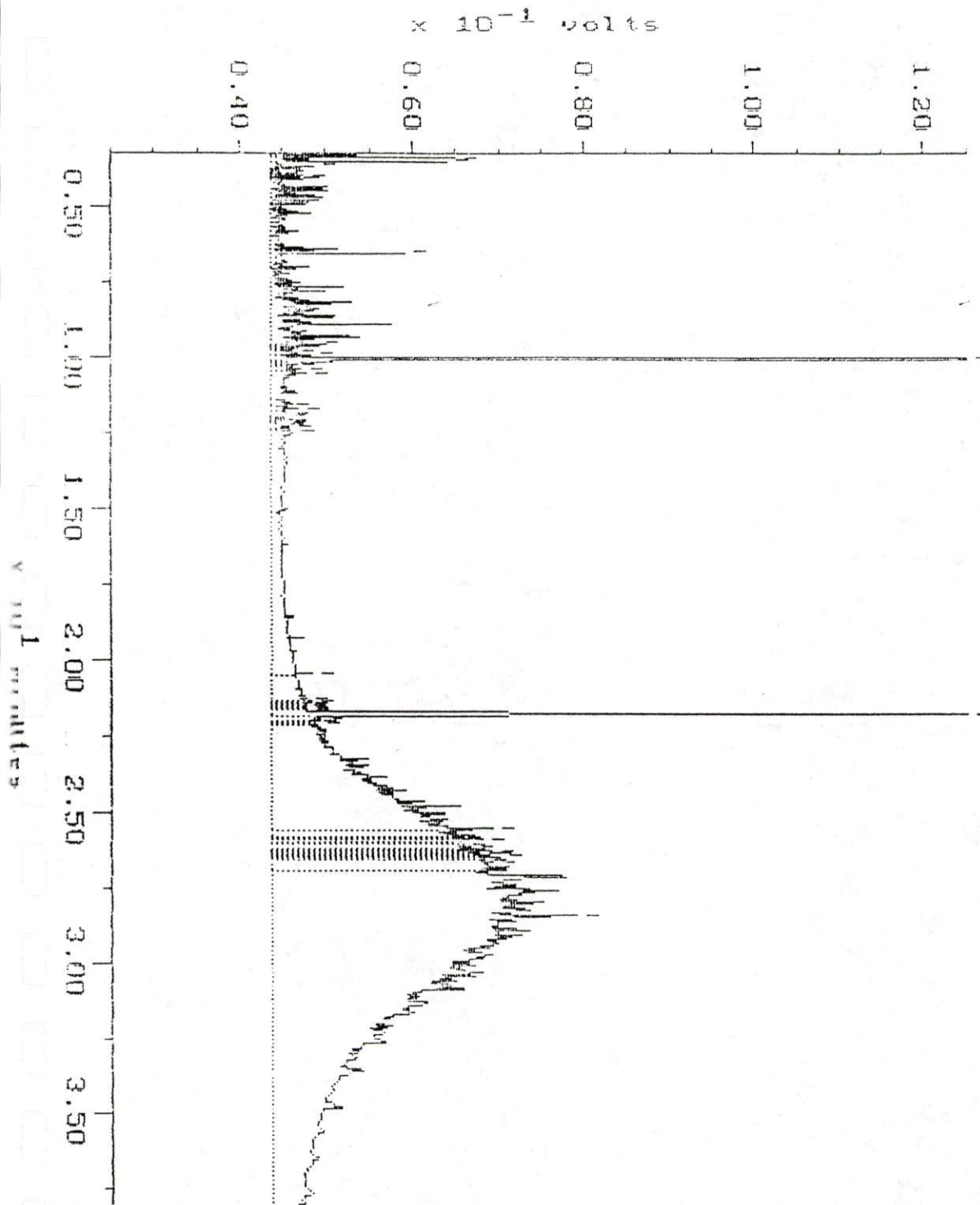
Filename: 1138WI18

Acquired: 01-DEC-92 0:10

Method: H:\BROE\MAXDATA\WILMA\FUEL1138

Operator: BRU

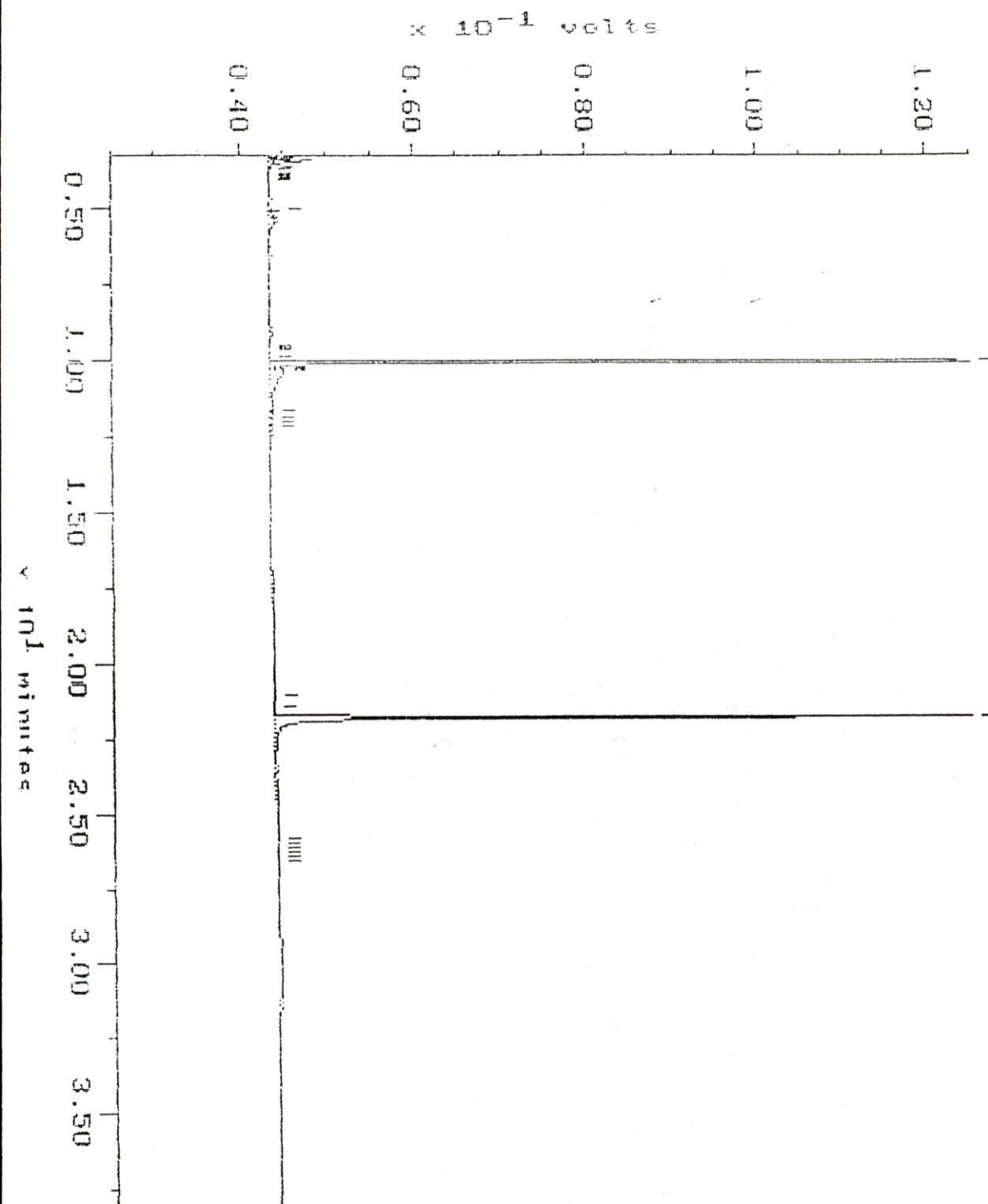
Inj Vol: 1.00



Sample: 9211-251-2
Acquired: 30-NOV-92 20:53
Inj Vol: 1.00

Channel: WILMA
Method: M:\2PRO2\MAXDATA\WILMA\FUEL1138

Filename: 1138WI06
Operator: BRU



WA DOE WTPH-HCID

Sample: 9211-251-5

Channel: WILMA

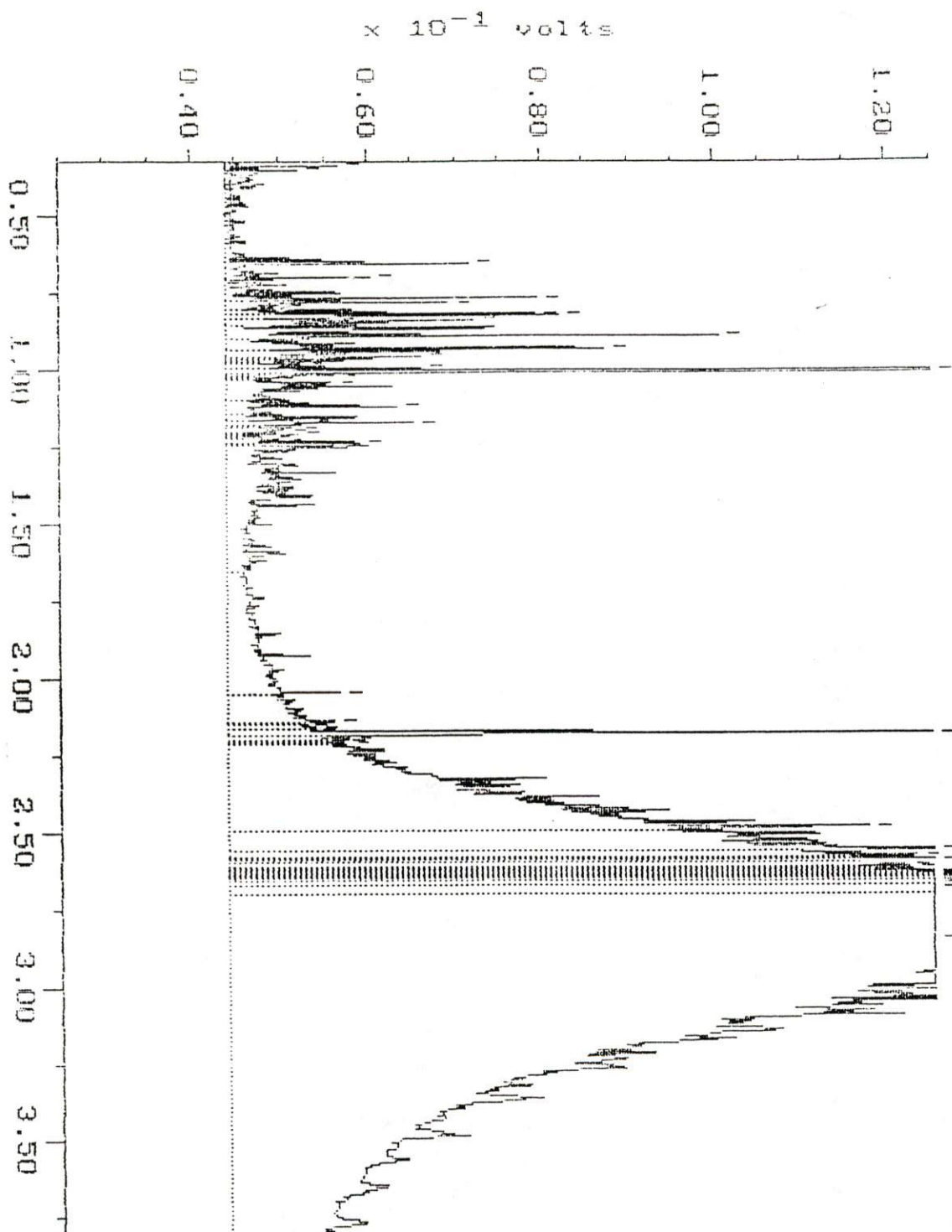
Filename: 1130W111

Acquired: 01-DEC-92 0:58

Method: M:\BRO2\MAXDATA\WILMA\FUEL1130

Operator: BRU

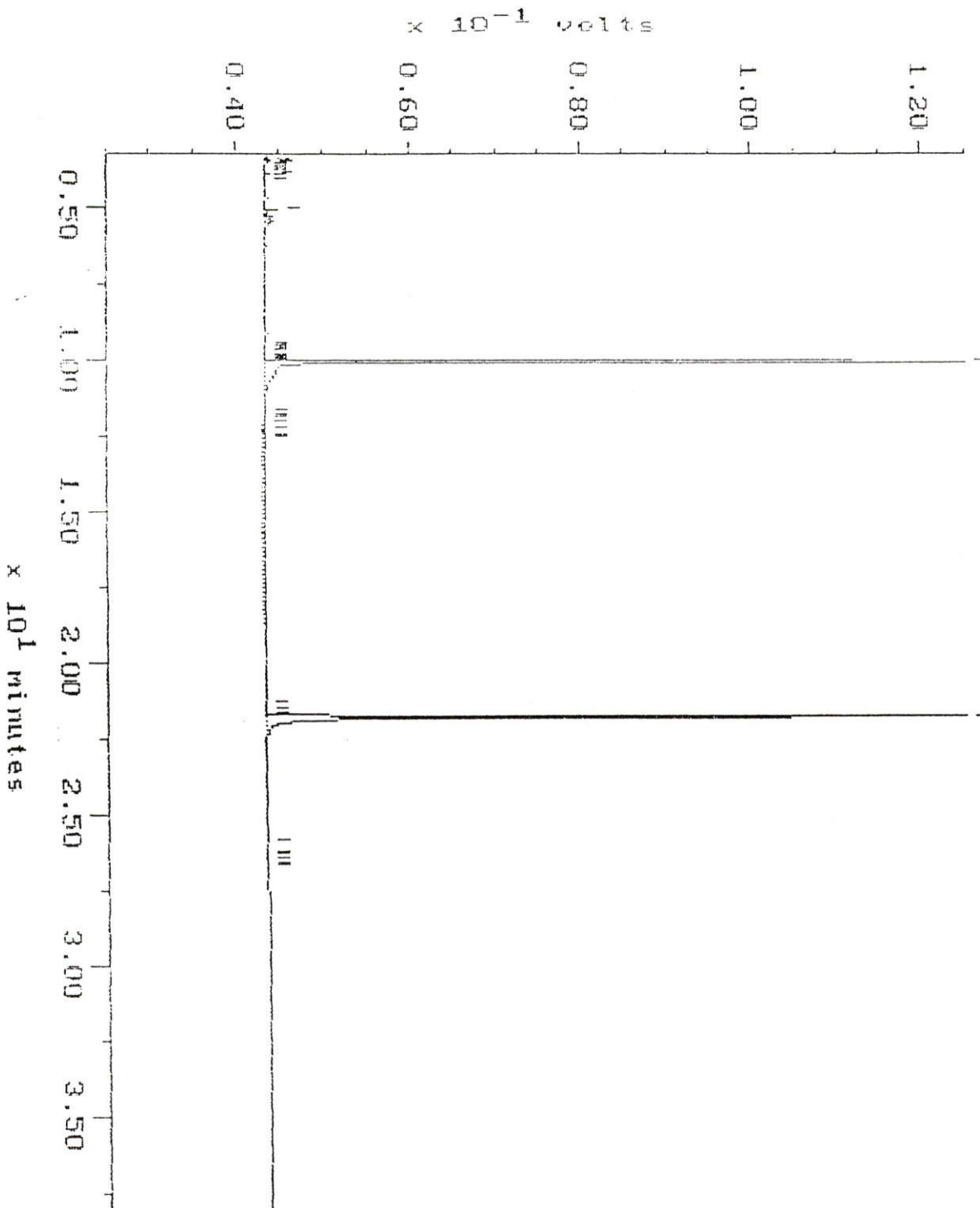
Inj Vol: 1.00



WA DOE WTPH-HCID

Sample: SRB 11-38 Channel: WILMA
 Acquired: 38-NOV-92 18:34 Method: M:\BRO2\MAXDATA\WILMA\FUEL1138
 Inj Vol: 1.88 Operator: BRU

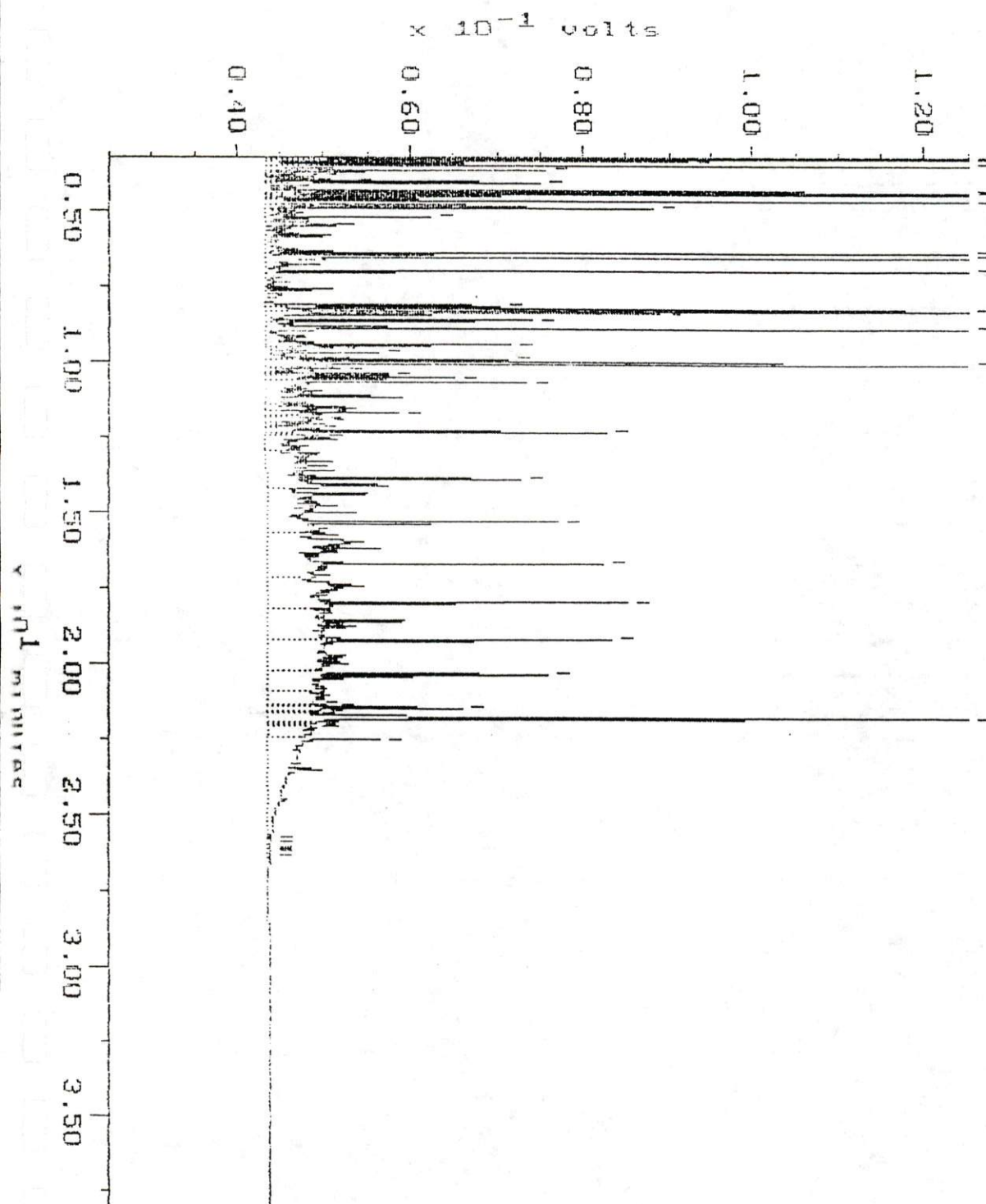
Filename: 1138WI83



WA DOE WTPH-HCID

Sample: 06 486 Channel: WILMA
 Acquired: 30-NOV-92 17:45 Method: M:\BRO2\MAXDATA\WILMA\FUEL1130
 Inj Vol: 1.00

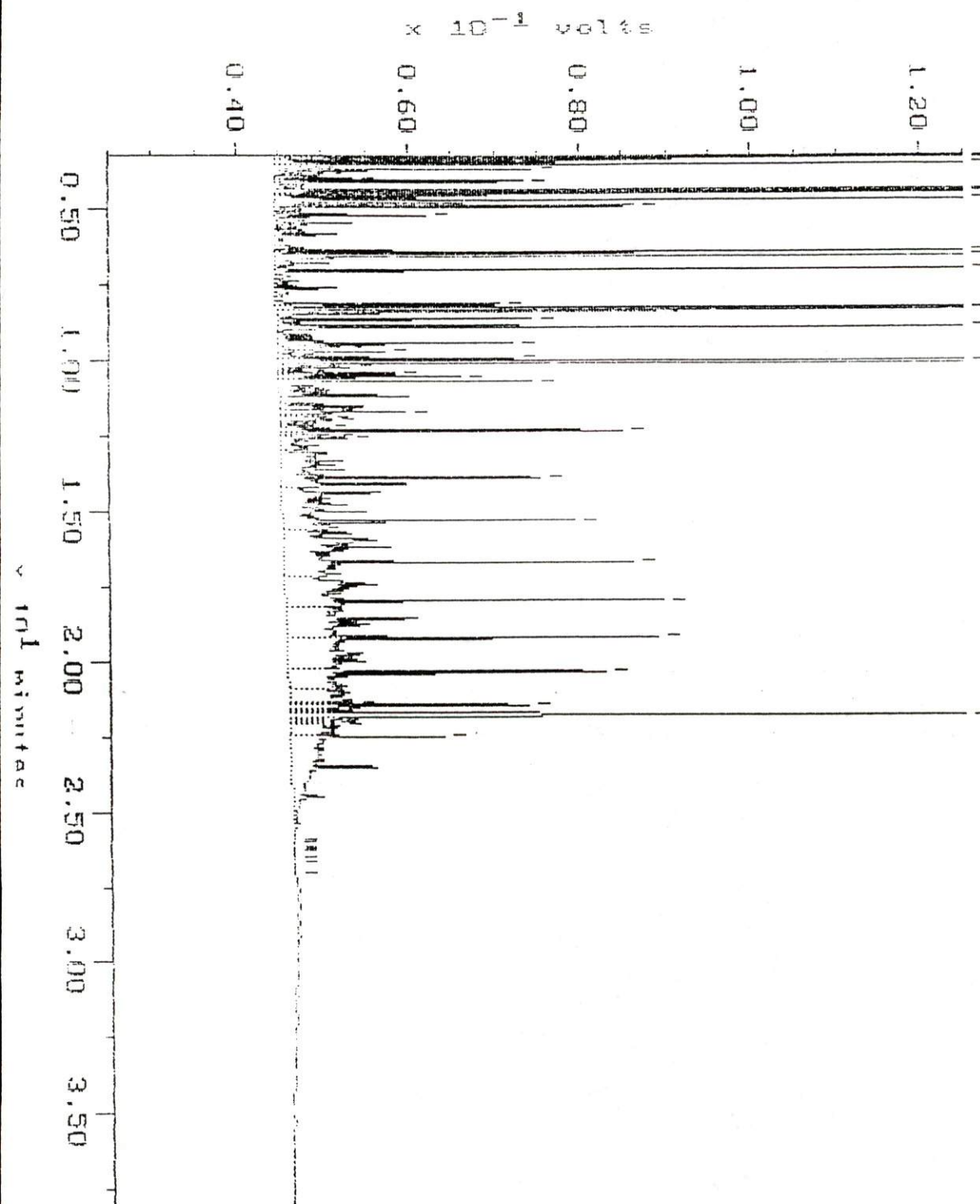
Filename: 1130W102
 Operator: BKO



WA DOE WTPH-HCID

Sample: DG 492 Channel: WILMA
 Acquired: 81-126-92 2:54 Method: M:\AK02\MAXDATA\WILMA\FUEL1138
 Inj Vol: 1.92

Filename: 1138W113
 Operator: BRU

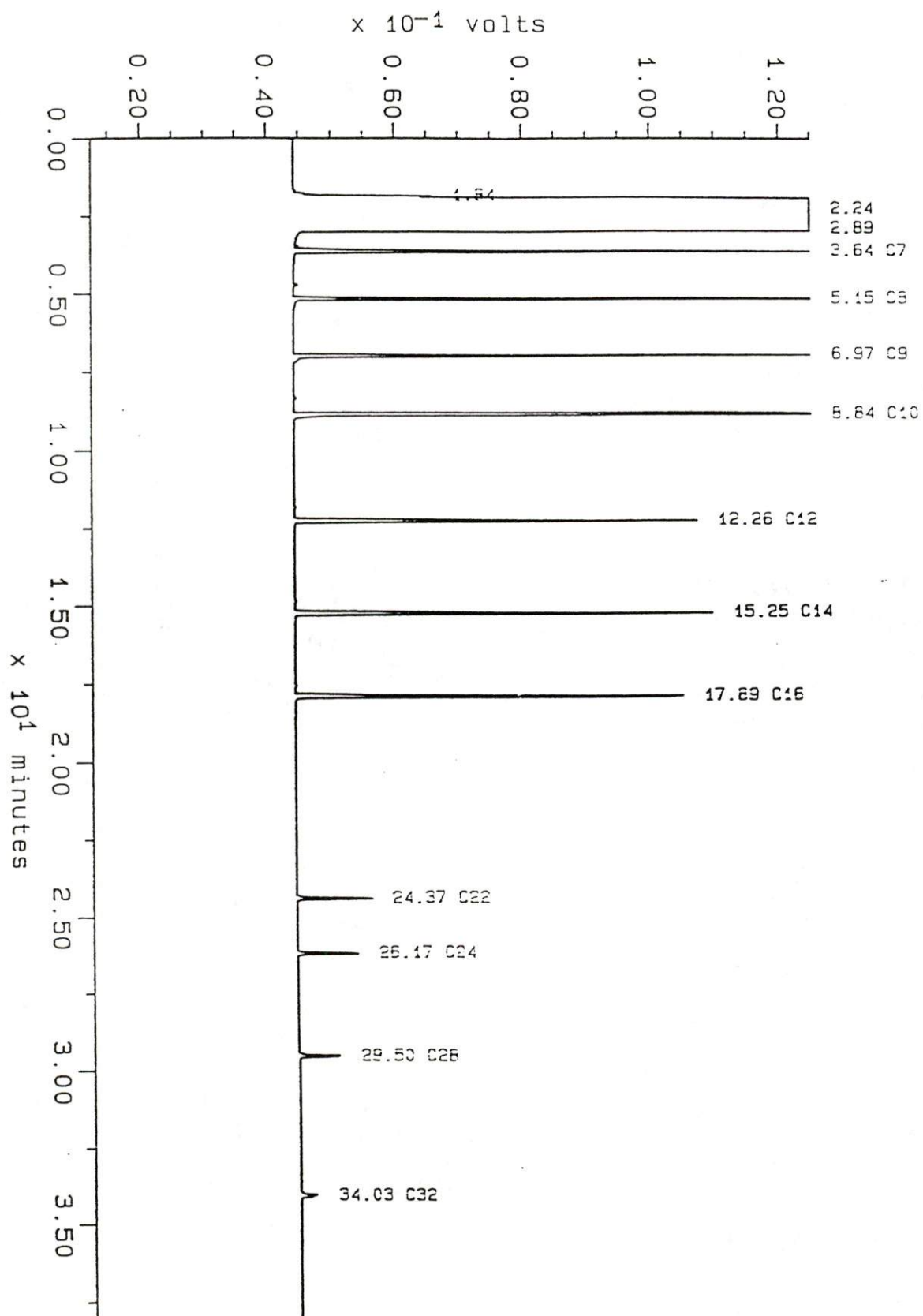


Alkane

Sample: ALKANE
Acquired: 02-NOV-92 11:50
Inj Vol: 1.00

Channel: WILMA
Method: M: \BRO2\MAXDATA\WILMA\FUEL1102

Filename: 1102WI02
Operator: BRO



WA DOE WTPH-G

Sample: 1000-101-1

Channel: JESPER-710

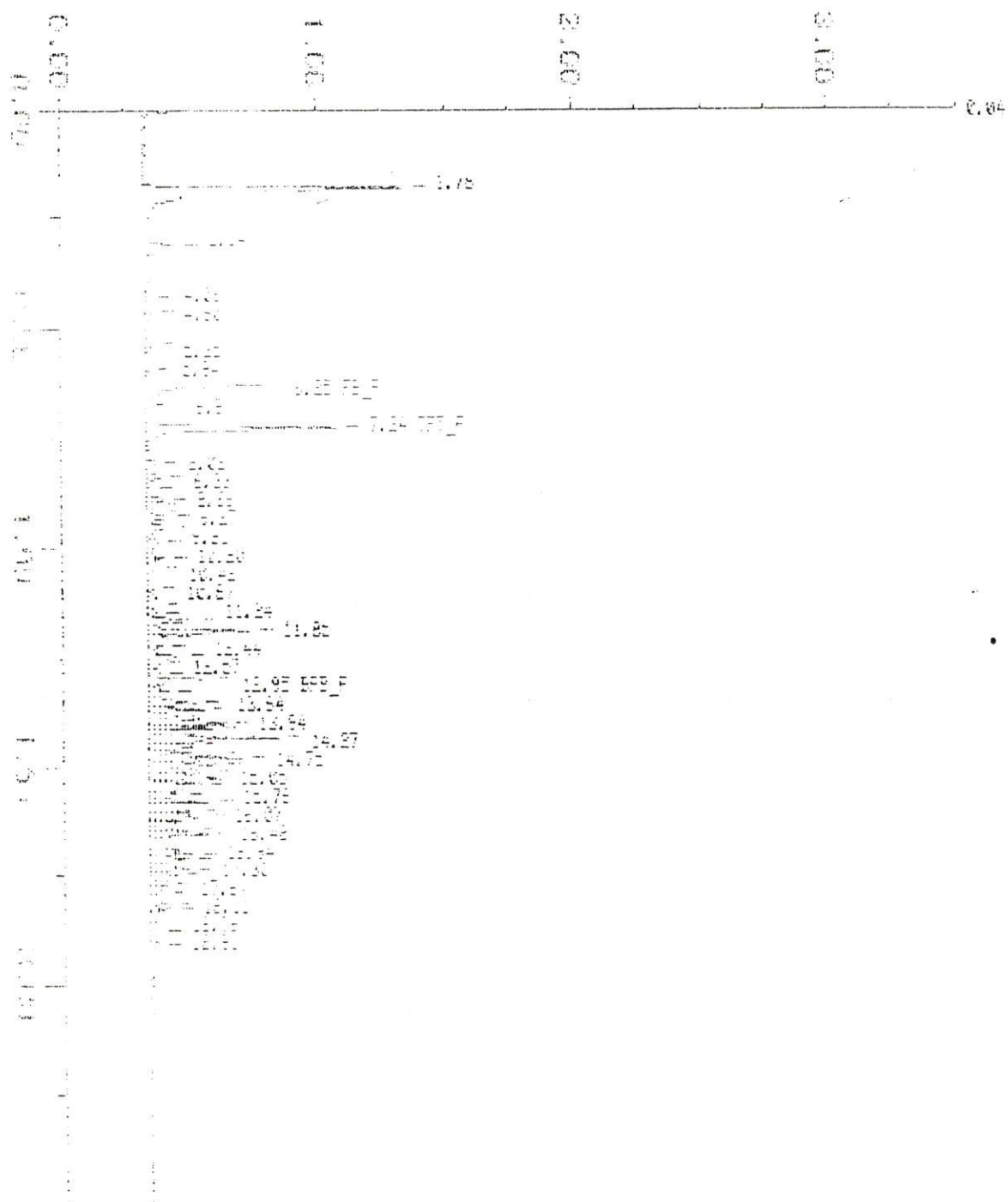
Filename: 10000911

Acquired: 01-11-88 10:05

Method: F1X8M12M1406TRJESPERME101000909

Operator:

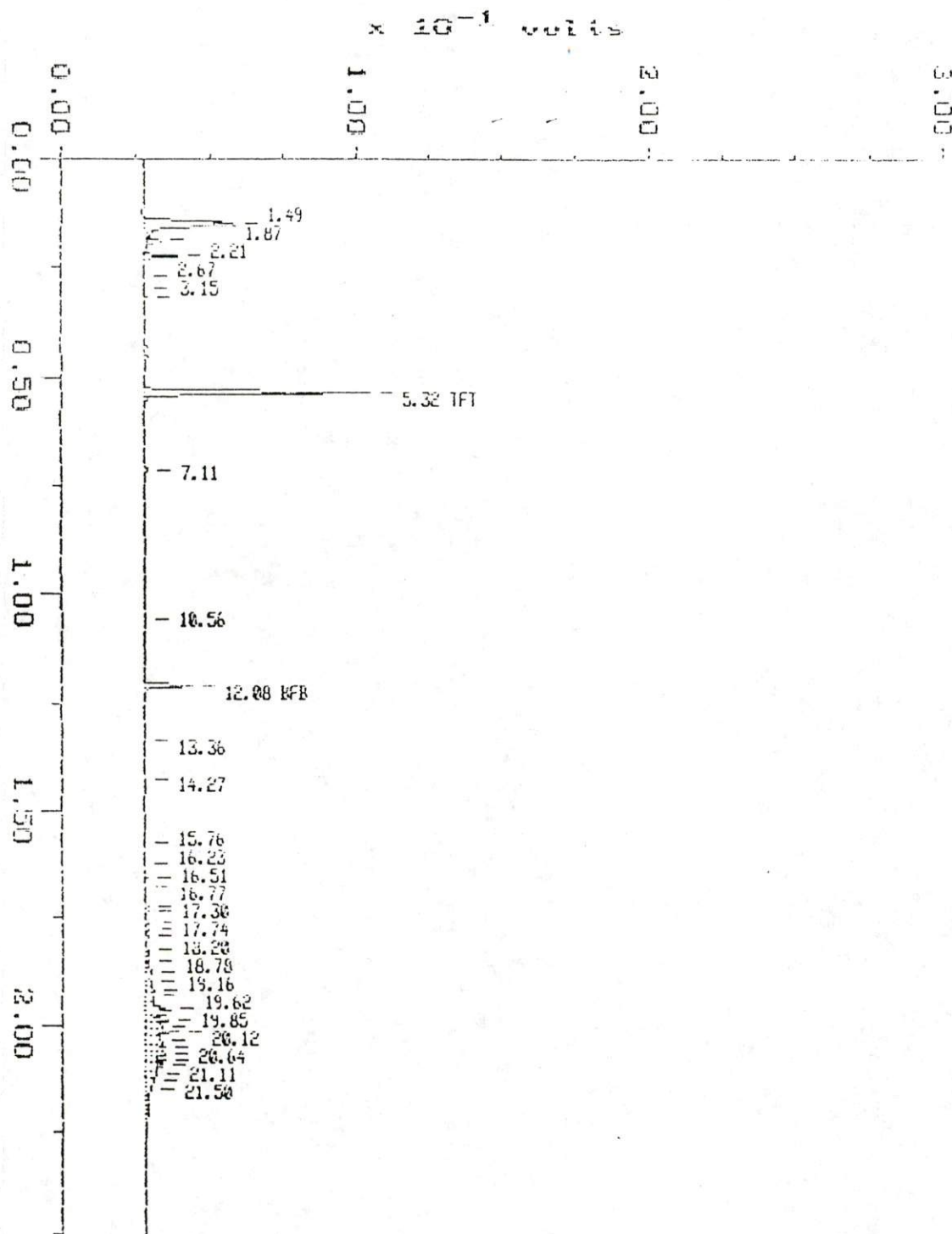
$\times 10^{-4}$ volts



WA DOE WTPH-G

Sample: 9211-251-3 Channel: PRISCILLA
 Acquired: 30-NOV-92 22:33 Method: H:\BR02\WAXDATA\ELVIS-PA11339SEP
 Comments: ATI FUELS: A MISSION OF EXCELLENCE IN ANALYTICAL CHROMATOGRAPHY.

Filename: 11339SEP11
 Operator: ATI

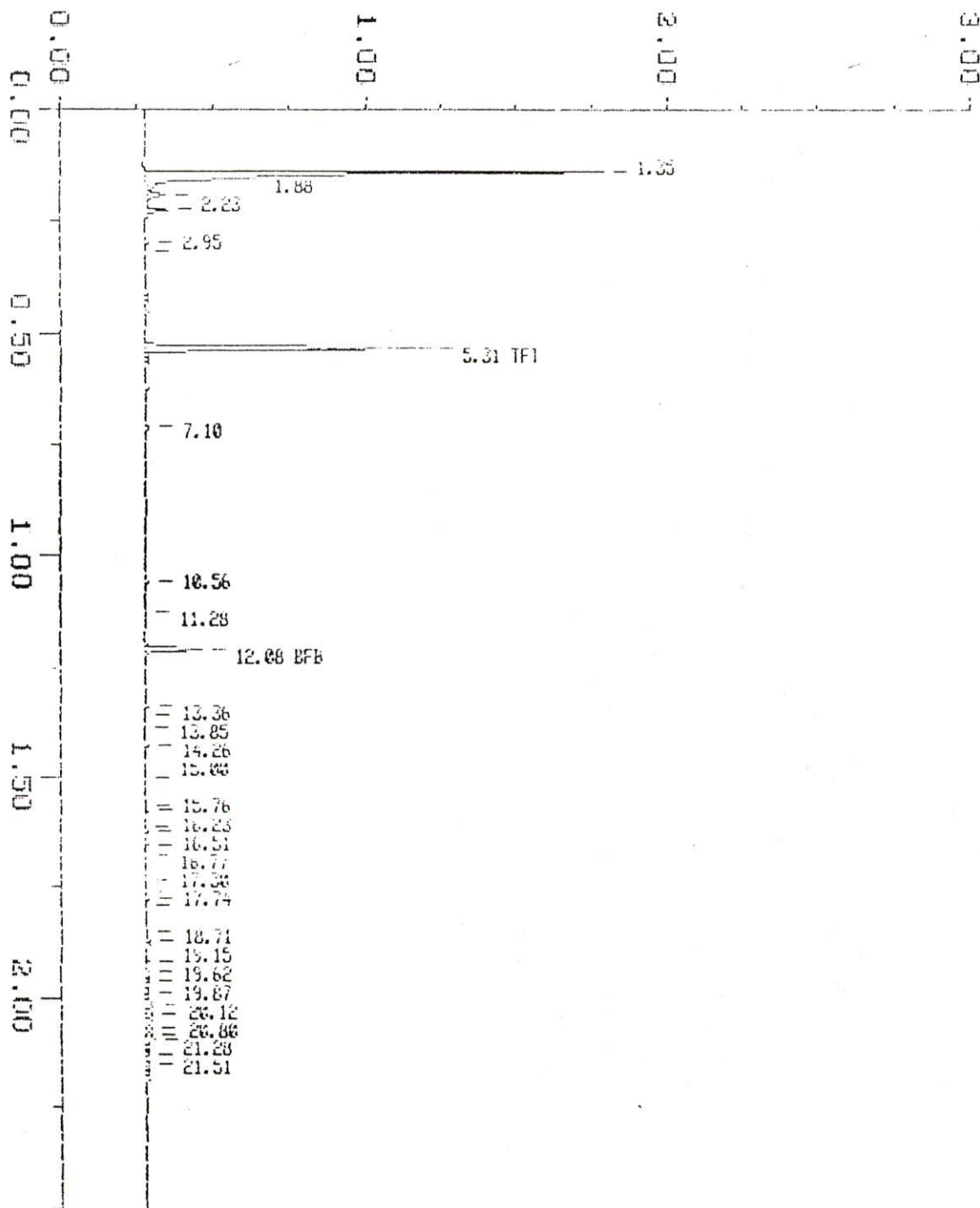


WA DOE WTPH-G

Sample: 9211-251-4 Channel: PRISCILLA
 Acquired: 30-NOV-92 23:06 Method: H:\BRO2\MAXDATA\ELVIS-PA\113092EP
 Comments: ATI FUELS: A MISSION OF EXCELLENCE IN ANALYTICAL CHROMATOGRAPHY.

Filename: 113092EP
 Operator: AT1

$\times 10^{-1}$ volts

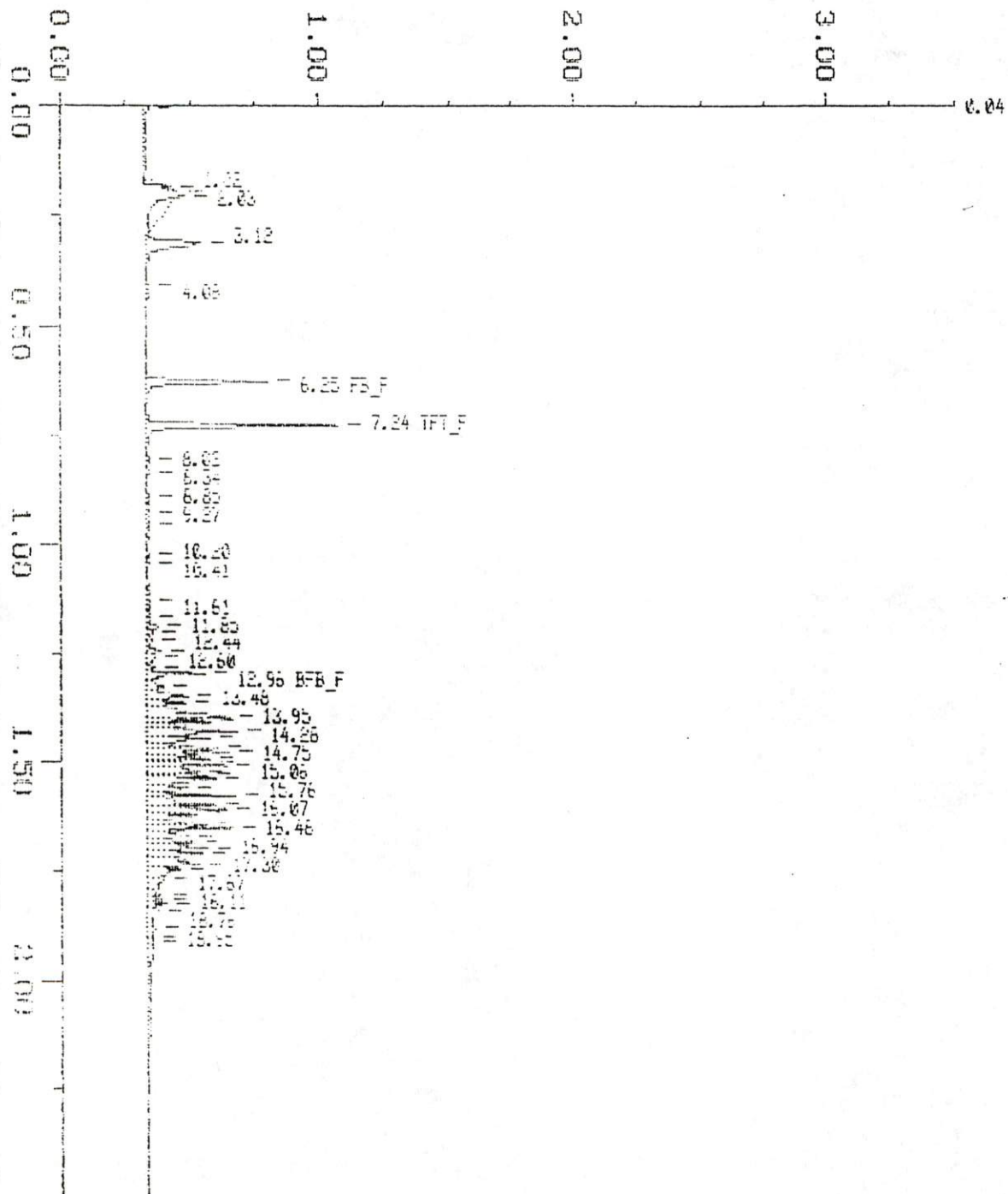


WA DOE WTPH-G

Sample: 9211-251-5 Channel: JEROME-FID
 Acquired: 02-DEC-92 19:40 Method: H:\802\MAXDATA\JEROME\J1202929

Filename: 1202JR10
 Operator:

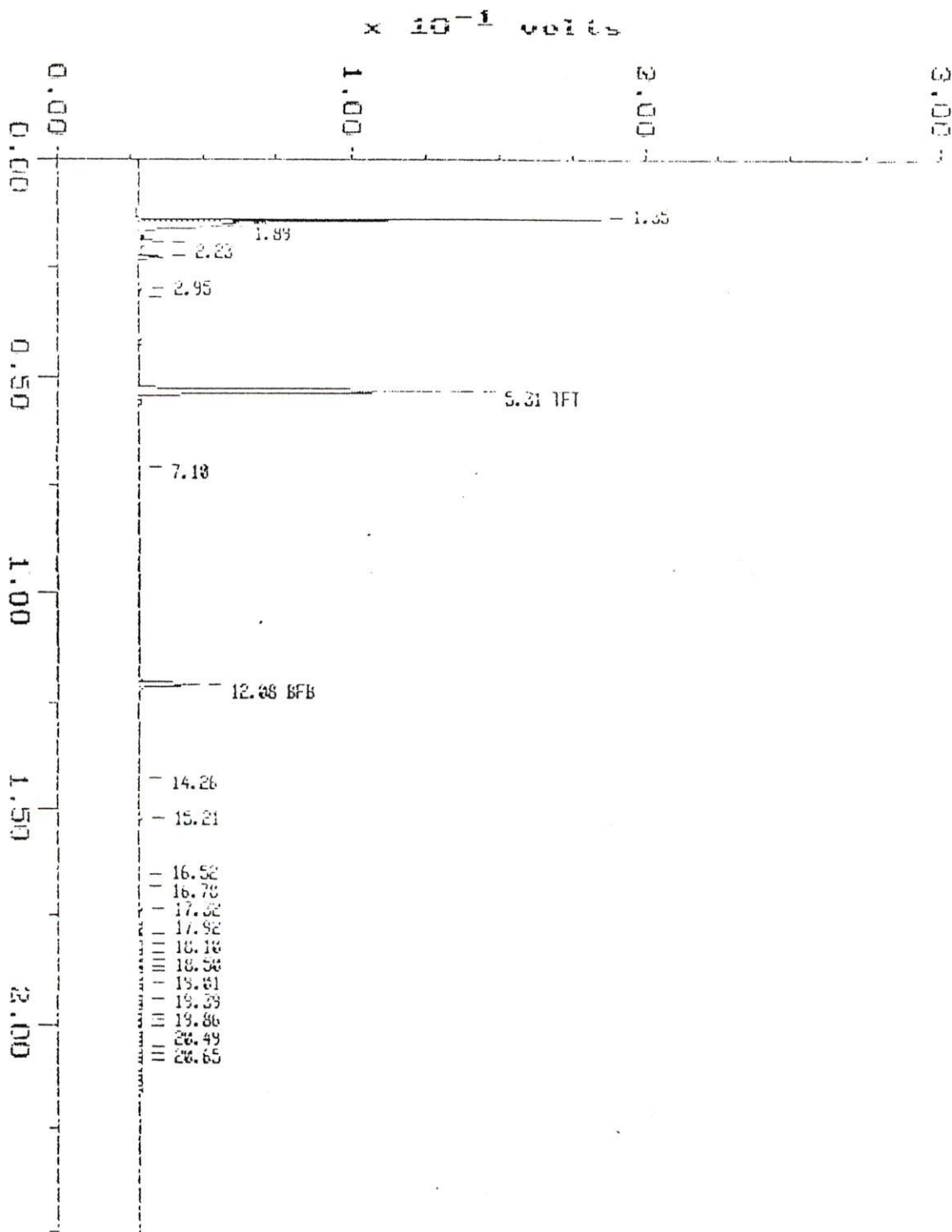
$\times 10^{-1}$ volts



WA DOE WTPH-G

Blank

Sample: SRB 1130 Channel: PRISCILLA Filename: 1130EP04
 Acquired: 30-NOV-92 18:25 Method: H:\BRO2\MAXDATA\ELVIS-PA113032EP Operator: ATI
 Comments: ATI FUELS: A MISSION OF EXCELLENCE IN ANALYTICAL CHROMATOGRAPHY.



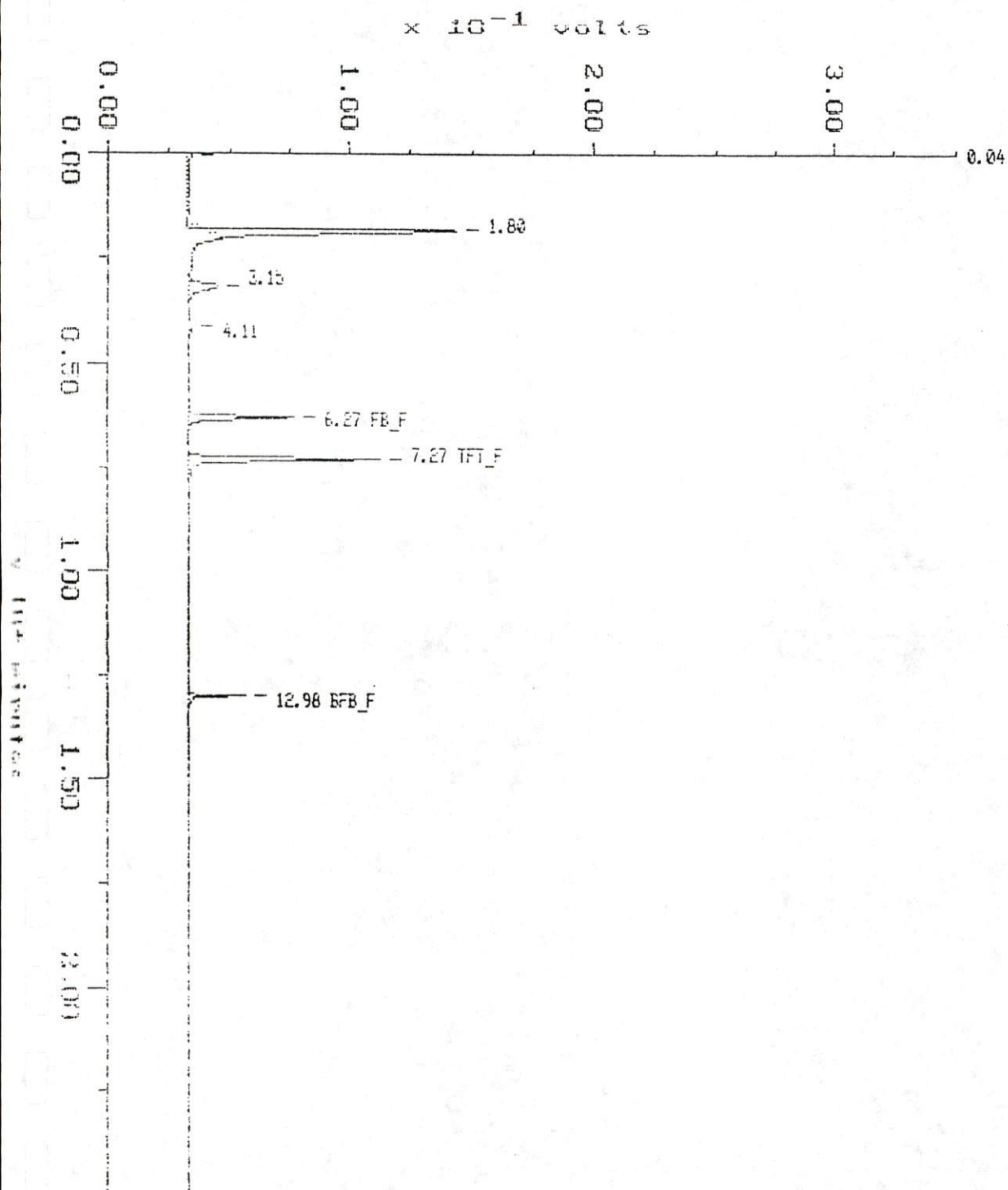
WA DOE WTPH-G

Blank

Sample: SRB 1202
Acquired: 02-DEC-92 16:27

Channel: JEROME-FID
Method: H:\BRO2\MAXDATA\JEROME\J120292A

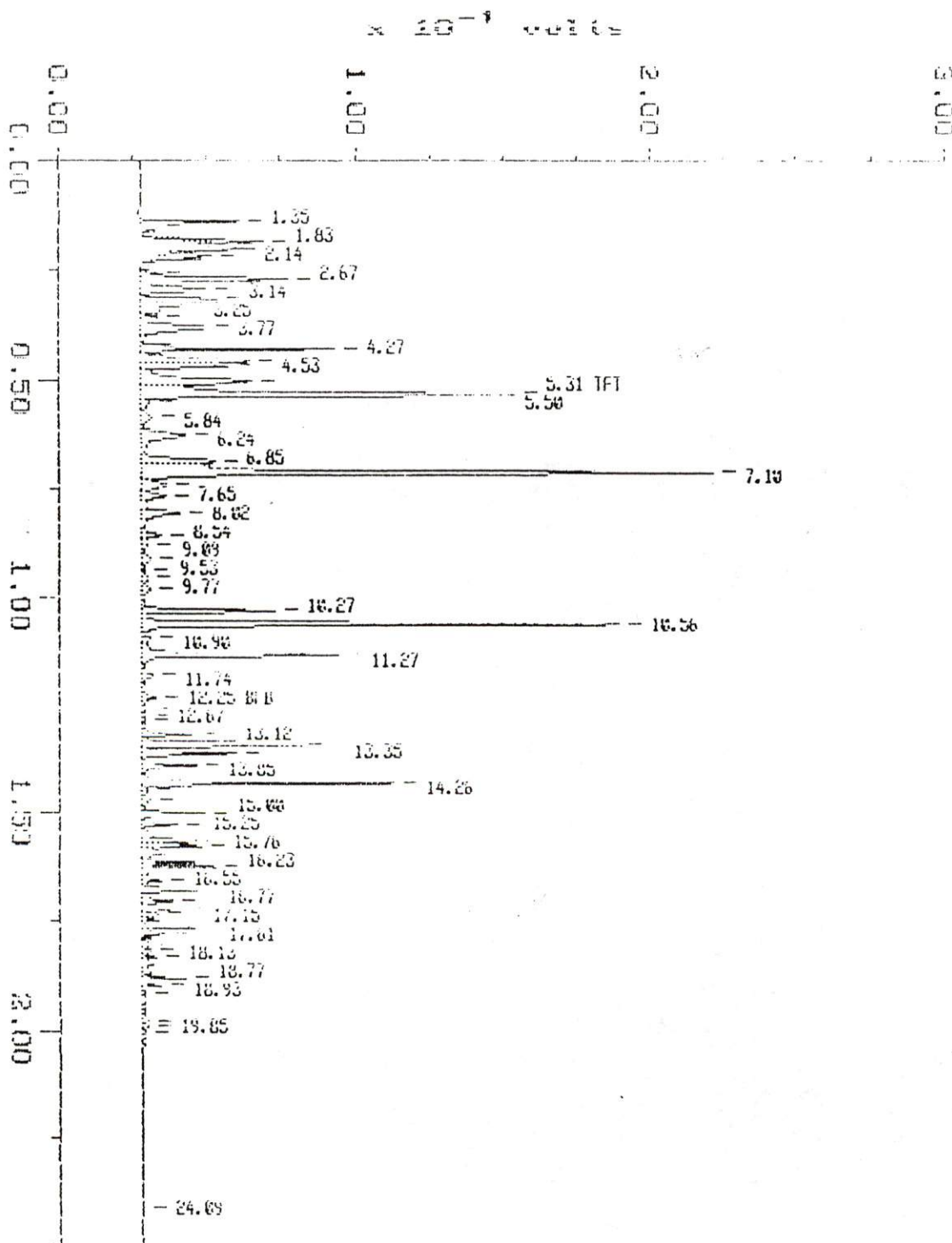
Filename: 1202JR04
Operator:



Continuing Calibration

Sample: WMS 1130 Channel: PRISCILLA
 Acquired: 30-NOV-92 9:56 Method: H:\BROU\MAXDATA\WV1S-FV1130.D
 Comments: ALL FUELS: A MISSION OF EXCELLENCE IN ANALYTICAL CHROMATOGRAPHY.

Filename: 113002F01
 Operator: ALL

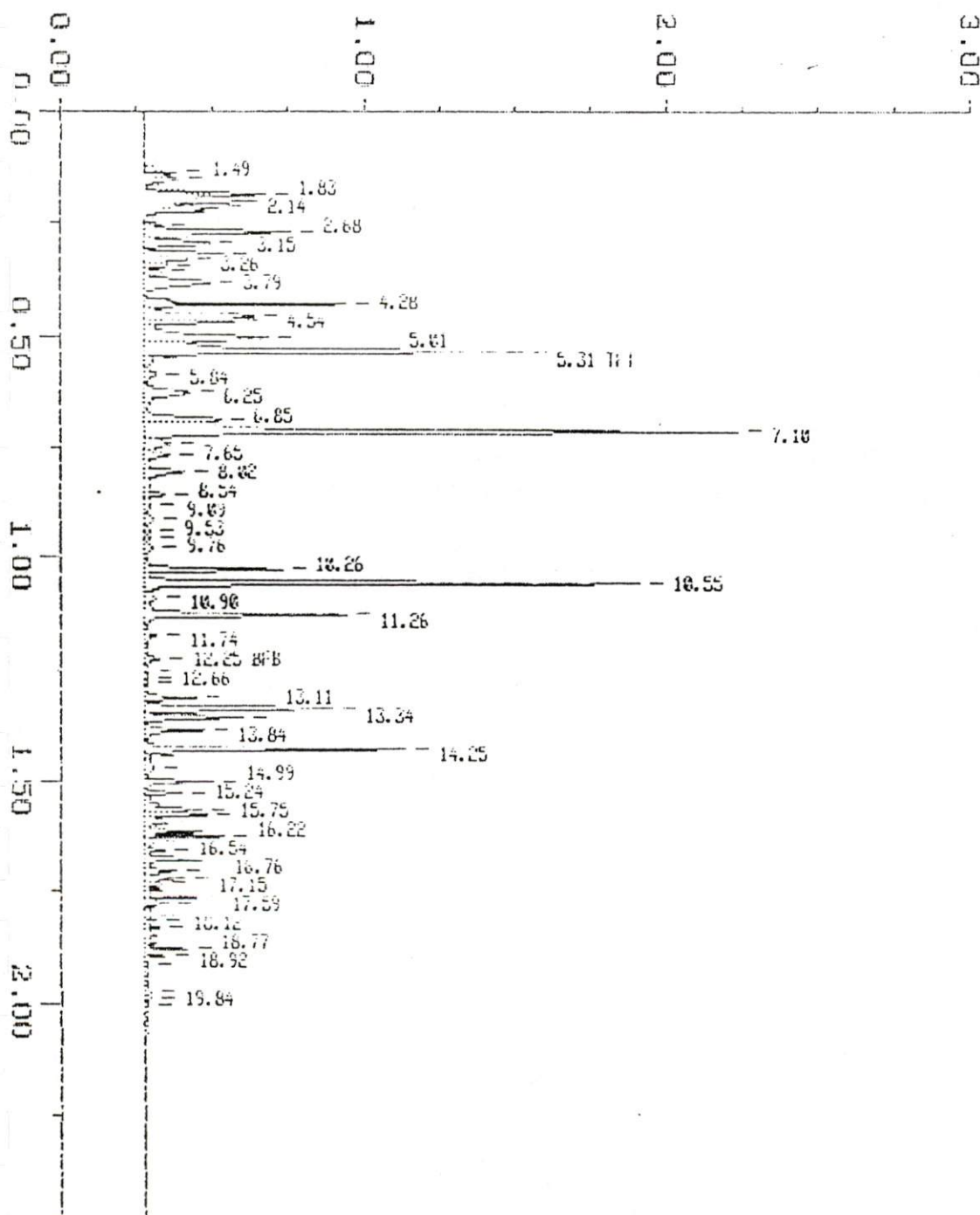


Continuing Calibration

Sample: c.c. 2 ppm Channel: PRISCILLA
Acquired: 01-DEC-92 0:31 Method: H:\BRO2\MAXDATA\ELVIS-PA110092EP
Comments: ALL FUELS: A MISSION OF EXCELLENCE IN ANALYTICAL CHROMATOGRAPHY.

Filename: 110092P16
Operator: ALL

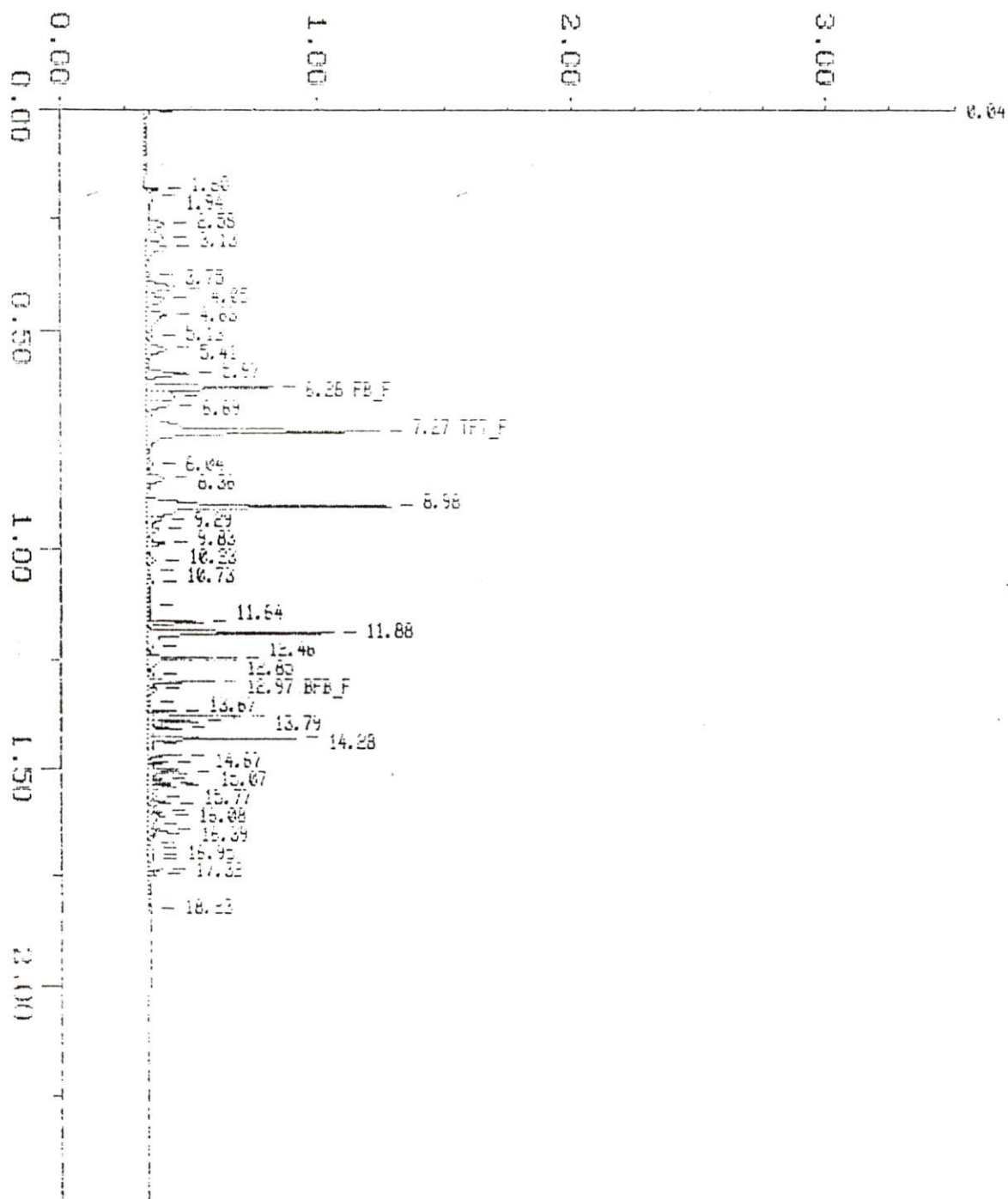
$\times 10^{-1}$ volts



Sample: STD-05 Channel: JEROME-FID
Acquired: 82-04-92 12:11 Method: H:\BROUW\DATA\JEROME\J120292A

Filename: 1202JH02
Operator:

$\times 10^{-1}$ volts



Sample: 101, 1 PPM

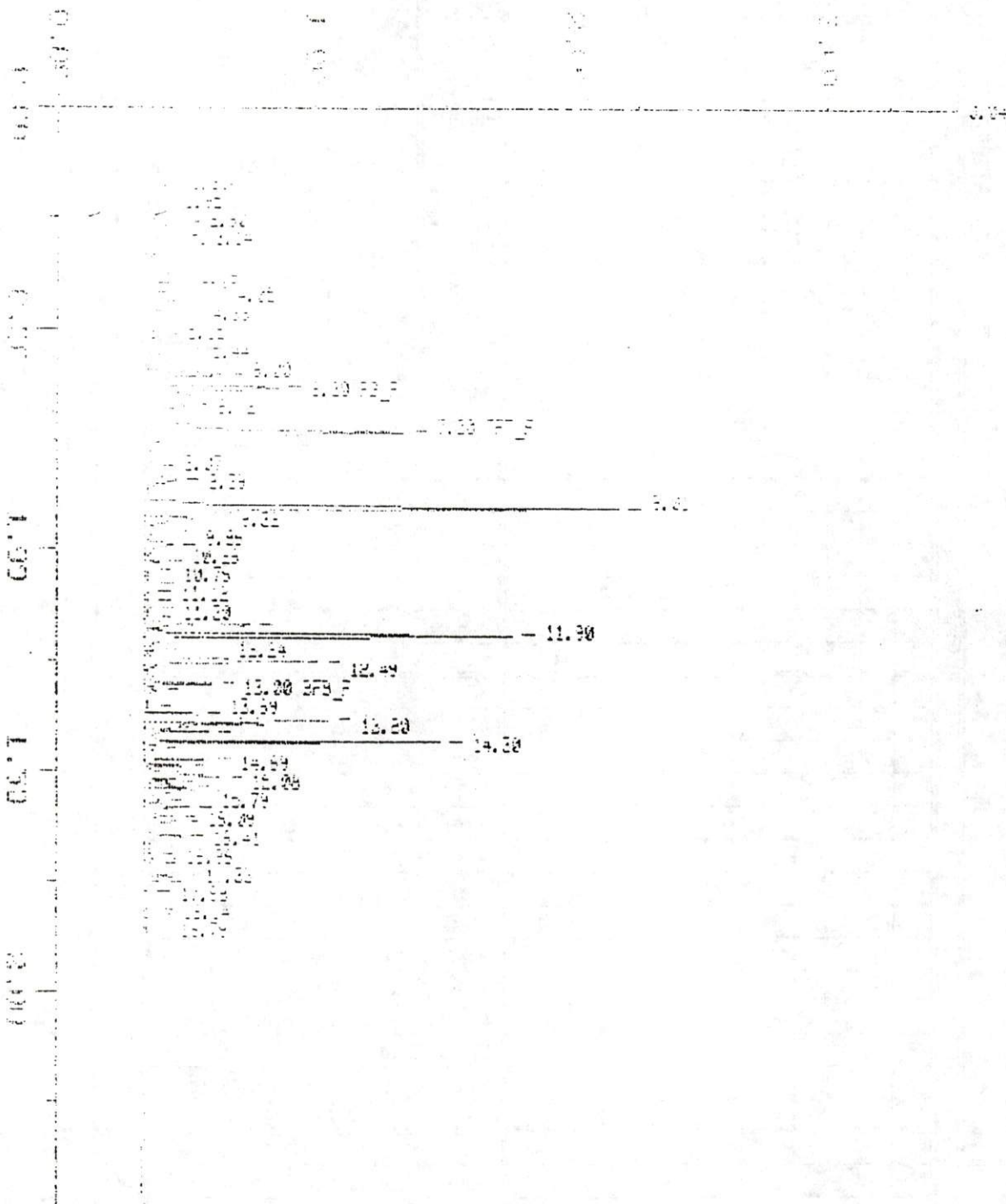
Channel: 100000-100

Filename: 100000-100

Acquired: 10-10-78 9:00

Method: 100000-100-100000-100000

Operator:





Analy

Technologies, Inc.

560 Naches Avenue, S.W., Suite 101, Renton, WA 98055 (206) 228-1135

DATE: 1/2/92

Page 1 of 1

ATI ACCESSION #

9-11-201

COMPANY: GFC ENGINEERS, TIA
 REPORT TO: Fred Frasse
 ADDRESS: 8410 NE 154th St
 Bellevue WA 98005
 PHONE: (206) 461-6000 FAX: () -
 PROJECT MANAGER: Fred Frasse
 PROJECT NUMBER: 92-080-124
 PROJECT NAME: Larson Bellingham
 ATI will (DISPOSE / RETURN samples (circle one))

FUELS										ORGANIC COMPOUNDS										METALS			TCLP			OTHER																	
TPH-HCID	WA/OR																			Metals (Indicate below *)			TCLP-Volatiles (ZHE-8240)			TCLP-Semivolatiles (8270)			TCLP-Pesticides (8080)			TCLP-Herbicides (8150)			TCLP-Metals (8 metals)			% Moisture (please indicate)			Total # of Containers/sample		
BETX/TPH-G combo	WA/OR																			Total Lead			TCLP-Volatiles (ZHE-8240)			TCLP-Semivolatiles (8270)			TCLP-Pesticides (8080)			TCLP-Herbicides (8150)			TCLP-Metals (8 metals)			Total # of Containers/sample					
BETX (by 8020)	WA/OR																			Priority Pollutant Metals (13)			TCLP-Volatiles (ZHE-8240)			TCLP-Semivolatiles (8270)			TCLP-Pesticides (8080)			TCLP-Herbicides (8150)			TCLP-Metals (8 metals)			Total # of Containers/sample					
TPH-G	WA/OR																			TAL Metals (23)			TCLP-Volatiles (ZHE-8240)			TCLP-Semivolatiles (8270)			TCLP-Pesticides (8080)			TCLP-Herbicides (8150)			TCLP-Metals (8 metals)			Total # of Containers/sample					
TPH-D	WA/OR																						TCLP-Volatiles (ZHE-8240)			TCLP-Semivolatiles (8270)			TCLP-Pesticides (8080)			TCLP-Herbicides (8150)			TCLP-Metals (8 metals)			Total # of Containers/sample					
8015 modified																							TCLP-Volatiles (ZHE-8240)			TCLP-Semivolatiles (8270)			TCLP-Pesticides (8080)			TCLP-Herbicides (8150)			TCLP-Metals (8 metals)			Total # of Containers/sample					
418.1																							TCLP-Volatiles (ZHE-8240)			TCLP-Semivolatiles (8270)			TCLP-Pesticides (8080)			TCLP-Herbicides (8150)			TCLP-Metals (8 metals)			Total # of Containers/sample					
413.2																							TCLP-Volatiles (ZHE-8240)			TCLP-Semivolatiles (8270)			TCLP-Pesticides (8080)			TCLP-Herbicides (8150)			TCLP-Metals (8 metals)			Total # of Containers/sample					
AK-GRO																							TCLP-Volatiles (ZHE-8240)			TCLP-Semivolatiles (8270)			TCLP-Pesticides (8080)			TCLP-Herbicides (8150)			TCLP-Metals (8 metals)			Total # of Containers/sample					
AK-DRO																							TCLP-Volatiles (ZHE-8240)			TCLP-Semivolatiles (8270)			TCLP-Pesticides (8080)			TCLP-Herbicides (8150)			TCLP-Metals (8 metals)			Total # of Containers/sample					
8240 GCMS Volatiles																							TCLP-Volatiles (ZHE-8240)			TCLP-Semivolatiles (8270)			TCLP-Pesticides (8080)			TCLP-Herbicides (8150)			TCLP-Metals (8 metals)			Total # of Containers/sample					
8270 GCMS Semivolatiles																							TCLP-Volatiles (ZHE-8240)			TCLP-Semivolatiles (8270)			TCLP-Pesticides (8080)			TCLP-Herbicides (8150)			TCLP-Metals (8 metals)			Total # of Containers/sample					
8080 Pesticides/PCBs																							TCLP-Volatiles (ZHE-8240)			TCLP-Semivolatiles (8270)			TCLP-Pesticides (8080)			TCLP-Herbicides (8150)			TCLP-Metals (8 metals)			Total # of Containers/sample					
PCB only (by 8080) STD/10 level																							TCLP-Volatiles (ZHE-8240)			TCLP-Semivolatiles (8270)			TCLP-Pesticides (8080)			TCLP-Herbicides (8150)			TCLP-Metals (8 metals)			Total # of Containers/sample					
8010 Halogenated VOCs																							TCLP-Volatiles (ZHE-8240)			TCLP-Semivolatiles (8270)			TCLP-Pesticides (8080)			TCLP-Herbicides (8150)			TCLP-Metals (8 metals)			Total # of Containers/sample					
8020 Aromatic VOCs																							TCLP-Volatiles (ZHE-8240)			TCLP-Semivolatiles (8270)			TCLP-Pesticides (8080)			TCLP-Herbicides (8150)			TCLP-Metals (8 metals)			Total # of Containers/sample					
8310 HPLC PAHs																							TCLP-Volatiles (ZHE-8240)			TCLP-Semivolatiles (8270)			TCLP-Pesticides (8080)			TCLP-Herbicides (8150)			TCLP-Metals (8 metals)			Total # of Containers/sample					
8040 Phenols																							TCLP-Volatiles (ZHE-8240)			TCLP-Semivolatiles (8270)			TCLP-Pesticides (8080)			TCLP-Herbicides (8150)			TCLP-Metals (8 metals)			Total # of Containers/sample					
8140 OP Pesticides																							TCLP-Volatiles (ZHE-8240)			TCLP-Semivolatiles (8270)			TCLP-Pesticides (8080)			TCLP-Herbicides (8150)			TCLP-Metals (8 metals)			Total # of Containers/sample					
8150 OC Herbicides																							TCLP-Volatiles (ZHE-8240)			TCLP-Semivolatiles (8270)			TCLP-Pesticides (8080)			TCLP-Herbicides (8150)			TCLP-Metals (8 metals)			Total # of Containers/sample					
																							TCLP-Volatiles (ZHE-8240)			TCLP-Semivolatiles (8270)			TCLP-Pesticides (8080)			TCLP-Herbicides (8150)			TCLP-Metals (8 metals)			Total # of Containers/sample					
																							TCLP-Volatiles (ZHE-8240)			TCLP-Semivolatiles (8270)			TCLP-Pesticides (8080)			TCLP-Herbicides (8150)			TCLP-Metals (8 metals)			Total # of Containers/sample					
																							TCLP-Volatiles (ZHE-8240)			TCLP-Semivolatiles (8270)			TCLP-Pesticides (8080)			TCLP-Herbicides (8150)			TCLP-Metals (8 metals)			Total # of Containers/sample					
																							TCLP-Volatiles (ZHE-8240)			TCLP-Semivolatiles (8270)			TCLP-Pesticides (8080)			TCLP-Herbicides (8150)			TCLP-Metals (8 metals)			Total # of Containers/sample					
																							TCLP-Volatiles (ZHE-8240)			TCLP-Semivolatiles (8270)			TCLP-Pesticides (8080)			TCLP-Herbicides (8150)			TCLP-Metals (8 metals)			Total # of Containers/sample					
																							TCLP-Volatiles (ZHE-8240)			TCLP-Semivolatiles (8270)			TCLP-Pesticides (8080)			TCLP-Herbicides (8150)			TCLP-Metals (8 metals)			Total # of Containers/sample					
																							TCLP-Volatiles (ZHE-8240)			TCLP-Semivolatiles (8270)			TCLP-Pesticides (8080)			TCLP-Herbicides (8150)			TCLP-Metals (8 metals)			Total # of Containers/sample					
																							TCLP-Volatiles (ZHE-8240)			TCLP-Semivolatiles (8270)			TCLP-Pesticides (8080)			TCLP-Herbicides (8150)			TCLP-Metals (8 metals)			Total # of Containers/sample					
																							TCLP-Volatiles (ZHE-8240)			TCLP-Semivolatiles (8270)			TCLP-Pesticides (8080)			TCLP-Herbicides (8150)			TCLP-Metals (8 metals)			Total # of Containers/sample					
																							TCLP-Volatiles (ZHE-8240)			TCLP-Semivolatiles (8270)			TCLP-Pesticides (8080)			TCLP-Herbicides (8150)			TCLP-Metals (8 metals)			Total # of Containers/sample					
																							TCLP-Volatiles (ZHE-8240)			TCLP-Semivolatiles (8270)			TCLP-Pesticides (8080)			TCLP-Herbicides (8150)			TCLP-Metals (8 metals)			Total # of Containers/sample					
																							TCLP-Volatiles (ZHE-8240)			TCLP-Semivolatiles (8270)			TCLP-Pesticides (8080)			TCLP-Herbicides (8150)			TCLP-Metals (8 metals)			Total # of Containers/sample					
																							TCLP-Volatiles (ZHE-8240)			TCLP-Semivolatiles (8270)			TCLP-Pesticides (8080)			TCLP-Herbicides (8150)			TCLP-Metals (8 metals)			Total # of Containers/sample					
																							TCLP-Volatiles (ZHE-8240)			TCLP-Semivolatiles (8270)			TCLP-Pesticides (8080)			TCLP-Herbicides (8150)			TCLP-Metals (8 metals)			Total # of Containers/sample					
																							TCLP-Volatiles (ZHE-8240)			TCLP-Semivolatiles (8270)			TCLP-Pesticides (8080)			TCLP-Herbicides (8150)			TCLP-Metals (8 metals)			Total # of Containers/sample					
																							TCLP-Volatiles (ZHE-8240)			TCLP-Semivolatiles (8270)			TCLP-Pesticides (8080)			TCLP-Herbicides (8150)			TCLP-Metals (8 metals)			Total # of Containers/sample					
																							TCLP-Volatiles (ZHE-8240)			TCLP-Semivolatiles (8270)			TCLP-Pesticides (8080)			TCLP-Herbicides (8150)			TCLP-Metals (8 metals)			Total # of Containers/sample					
																							TCLP-Volatiles (ZHE-8240)			TCLP-Semivolatiles (8270)			TCLP-Pesticides (8080)			TCLP-Herbicides (8150)			TCLP-Metals (8 metals)			Total # of Containers/sample					
																							TCLP-Volatiles (ZHE-8240)			TCLP-Semivolatiles (8270)			TCLP-Pesticides (8080)			TCLP-Herbicides (8150)			TCLP-Metals (8 metals)			Total # of Containers/sample					
																							TCLP-Volatiles (ZHE-8240)			TCLP-Semivolatiles (8270)			TCLP-Pesticides (8080)			TCLP-Herbicides (8150)			TCLP-Metals (8 metals)			Total # of Containers/sample					
																							TCLP-Volatiles (ZHE-8240)			TCLP-Semivolatiles (8270)			TCLP-Pesticides (8080)			TCLP-Herbicides (8150)			TCLP-Metals (8 metals)			Total # of Containers/sample					
																							TCLP-Volatiles (ZHE-8240)			TCLP-Semivolatiles (8270)			TCLP-Pesticides (8080)			TCLP-Herbicides (8150)			TCLP-Metals (8 metals)			Total # of Containers/sample					
																							TCLP-Volatiles (ZHE-8240)			TCLP-Semivolatiles (8270)			TCLP-Pesticides (8080)			TCLP-Herbicides (8150)			TCLP-Metals (8 metals)			Total # of Containers/sample					
																							TCLP-Volatiles (ZHE-8240)			TCLP-Semivolatiles (8270)			TCLP-Pesticides (8080)			TCLP-Herbicides (8150)			TCLP-Metals (8 metals)			Total # of Containers/sample					
																							TCLP-Volatiles (ZHE-8240)			TCLP-Semivolatiles (8270)			TCLP-Pesticides (8080)			TCLP-Herbicides (8150)			TCLP-Metals (8 metals)			Total # of Containers/sample					
																							TCLP-Volatiles (ZHE-8240)			TCLP-Semivolatiles (8270)			TCLP-Pesticides (8080)			TCLP-Herbicides (8150)			TCLP-Metals (8 metals)			Total # of Containers/sample					
																							TCLP-Volatiles (ZHE-8240)			TCLP-Semivolatiles (8270)			TCLP-Pesticides (8080)			TCLP-Herbicides (8150)			TCLP-Metals (8 metals)			Total # of Containers/sample					
																							TCLP-Volatiles (ZHE-8240)			TCLP-Semivolatiles (8270)			TCLP-Pesticides (8080)			TCLP-Herbicides (8150)			TCLP-Metals (8 metals)			Total # of Containers/sample					
																							TCLP-Volatiles (ZHE-8240)			TCLP-Semivolatiles (8270)			TCLP-Pesticides (8080)			TCLP-Herbicides (8150)			TCLP-Metals (8 metals)			Total # of Containers/sample					
																							TCLP-Volatiles (ZHE-8240)			TCLP-Semivolatiles (8270)			TCLP-Pesticides (8080)			TCLP-Herbicides (8150)			TCLP-Metals (8 metals)			Total # of Containers/sample					
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																							TCLP-Volatiles (ZHE-8240)			TCLP-Semivolatiles (8270)			TCLP-Pesticides (8080)			TCLP-Herbicides (8150)			TCLP-Metals (8 metals)			Total # of Containers/sample					
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Sample ID	Date	Time	Matrix	LabID
921125-1026	1/25/92	1135	S	1
921125-1027	1/25/92	1115	S	2
921125-1028	1/25/92	1110	S	3
921125-1029	1/25/92	1450	S	4
921125-7	1/25/92	1500	S	5

Turnaround Time		Sample Receipt		Relinquished By:		Relinquished By:		Relinquished By:	
STANDARD TAT		TOTAL # CONTAINERS RECVD	1	DATE KING	Date:		Date:		Date:
1 WEEK TAT		COC SEALS PRESENT?	X	1/2/92	Time:		Time:		Time:
4 WORK DAY TAT		COC SEALS INTACT?	X	BET	Time:		Time:		Time:
3 WORK DAY TAT		RECEIVED COLD?	X						
2 WORK DAY TAT	X	RECEIVED INTACT?	X	Received By:	Date:		Date:		Date:
24 HOUR TAT		RECEIVED VIA:			Time:		Time:		Time:
Special Instructions:				Received By:		Received By:		Received By:	
If volatile concentrations are less than 100 mg/L then run BTEX				DATE KING		DATE KING		DATE KING	
* Metals needed:									

Corporate Offices: 5550 Morehouse Drive, San Diego, CA 92121 (619)458-9141