Progress Report No. 2
Quarterly Ground Water Monitoring and Supplemental Subsurface Explorations
Former Unocal Bulk Plant 0082
Chelan, Washington

May 14, 1993

For
Unocal

GeoEngineers

May 14, 1993

Geotechnical,
Geoenvironmental and
Geologic Services

Unocal
P.O. Box 76
Seattle, Washington 98111

Attention: Mr. Joe Comstock

We are submitting four copies of Progress Report No. 2 summarizing subsurface explorations and ground water monitoring at the site of Unocal Bulk Plant 0082 in Chelan, Washington. Contractual terms for our services are included in blanket contract B1982F.

We appreciate the opportunity to be of continued service to Unocal. Please call if you have questions regarding this report.

Yours very truly,

GeoEngineers, Inc.

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QUARTERLY GROUND WATER MONITORING
AND SUPPLEMENTAL SUBSURFACE EXPLORATIONS
FORMER UNOCAL BULK PLANT 0082
CHELAN, WASHINGTON

INTRODUCTION AND BACKGROUND

This report presents the results of GeoEngineers' May, August and November 1992 ground water monitoring activities and supplemental subsurface explorations performed at the site of former Unocal Bulk Plant 0082. The site is located southeast of the intersection between Highway 97 and East Street, approximately 400 feet from the south shore of Lake Chelan. The former layout of the site, with approximate monitoring well locations, is shown in Figures 1, 2 and 3.

In August 1991, Ecology (Washington State Department of Ecology) gave Bulk Plant 0082 a tentative hazard ranking of one on a scale of one to five using the Washington Ranking Method. A ranking of one indicates that contamination at the site poses a high potential threat to human health and the environment relative to other Washington sites ranked by Ecology.

GeoEngineers performed a subsurface contamination study at the site of Bulk Plant 0082 in November and December 1989. Explorations completed at the site included the installation of monitoring wells MW-1 through MW-3 at the approximate locations shown in Figures 1, 2 and 3. In this study, TPH (total petroleum hydrocarbons) were detected in soil samples obtained from monitoring well MW-1 at concentrations exceeding the MTCA (Model Toxics Control Act) Method A cleanup level. Monitoring well MW-1 is located near the truck unloading area. BETX (benzene, ethylbenzene, toluene and xylenes) and/or TPH were detected at concentrations exceeding the MTCA Method A cleanup levels in water samples obtained from monitoring wells MW-1 and MW-3. Monitoring well MW-3 is located near the former warehouse. Water level measurements in the three wells indicated a relatively flat ground water gradient with an inferred direction of ground water flow toward the east. The results of our 1989 study are presented in our "Report of Geotechnical Services" dated March 14, 1990. Ground water elevations and combustible vapor concentrations measured in MW-1 through MW-3 during our 1989 study are presented in Table 1. Ground water chemical analytical data obtained during our 1989 study are summarized in Table 2.

GeoEngineers observed the drilling and installation of three additional monitoring wells (MW-4, MW-5 and MW-6) at the site in April 1991. The approximate locations of MW-4 through MW-6 are shown in Figure 1. BETX and TPH were detected at concentrations exceeding the MTCA Method A cleanup levels in soil samples obtained from MW-5, located near the former ASTs (aboveground storage tanks). One or more components of BETX and fuel hydrocarbons quantified as gasoline were detected at concentrations exceeding the MTCA Method A cleanup levels in water samples obtained in April 1991 from MW-1 and MW-5.

Dissolved lead was detected at concentrations exceeding the MTCA Method A cleanup level in the ground water samples obtained from MW-1 through MW-4 in April 1991. Water level measurements in the six wells indicated a relatively flat ground water gradient with an inferred direction of ground water flow toward the east-southeast. The results of our April 1991 study are presented in our "Supplemental Report of Geotechnical Services" dated September 3, 1991. Ground water elevations and combustible vapor concentrations measured in MW-1 through MW-6 during our April 1991 study are identified in Table 1. Ground water chemical analytical data obtained during our April 1991 study are summarized in Table 2.

GeoEngineers continued ground water monitoring events at the site between July 1991 and February 1992. Ground water samples were obtained on August 27 and November 23, 1991, and on February 20, 1992. BETX and gasoline-, diesel- and heavy oil-range hydrocarbons were detected at concentrations exceeding MTCA Method A cleanup levels in the ground water samples obtained from MW-1 and MW-5. Dissolved lead was detected in ground water samples obtained from MW-1 and MW-4 at concentrations exceeding the MTCA Method A cleanup level. Diesel- and heavy oil-range hydrocarbons were detected at concentrations exceeding MTCA Method A cleanup levels in the ground water sample obtained from MW-3 on February 20, 1992. Petroleum-related contamination exceeding MTCA Method A cleanup levels was not detected in ground water samples obtained from MW-3 during previous monitoring events. Contamination detected in the ground water sample obtained from MW-3 on February 20 may have been related to the unusual inferred ground water flow direction toward the west, possibly caused by the low water level of Lake Chelan. The results of our ground water monitoring activities between August 27, 1991 and February 20, 1992 are summarized in our report titled "Results of Ground Water Monitoring, July 1991 to February 1992," and dated June 11, 1992. Results of a water well search completed by GeoEngineers in the area of the site are also included in the June 1992 report. Ground water elevations and combustible vapor concentrations measured between July 1991 and February 1992 are included in Table 1. Ground water chemical analytical data are summarized in Table 2.

SCOPE

The purpose of our most recent services was: (1) to evaluate the degree of soil and ground water contamination beneath and adjacent to the former AST area by drilling and installing one additional monitoring well and by obtaining a shallow subsurface soil sample, and (2) to evaluate ground water conditions at the site of former Bulk Plant 0082 by quarterly ground water sampling. The scope of services completed for this phase of the project is as follows:

1. Drill one exploratory boring (MW-7) using air rotary drilling equipment.
2. Obtain soil samples at approximate 2.5-foot intervals from boring MW-7 and a shallow subsurface soil sample (S-1) in the vicinity of the former ASTs. Conduct field screening on each sample for evidence of petroleum-related contamination using visual, water sheen and headspace vapor screening methods. Field screening methods are described in Appendix A.

3. Submit two soil samples from MW-7 and shallow subsurface soil sample S-1 for the following analyses: BETX by EPA Method 8020, gasoline-range hydrocarbons by Ecology Method WTPH-G, and diesel-range hydrocarbons by Ecology Method WTPH-D. The laboratory data sheets, chain-of-custody records and our review of the laboratory QC (quality control) documentation are provided in Appendix B.
4. Install a 2-inch-diameter PVC (polyvinyl chloride) well casing in MW-7 with a flush-grade locking surface monument.
5. Survey the casing rim elevation of MW-7 to an accuracy of 0.01 foot using an engineer's level and a temporary benchmark with an assumed elevation of 100.00 feet.
6. Develop the well screen of MW-7 by hand-bailing.
7. Measure the depth to ground water in MW-1 through MW-7 on a quarterly basis for determination of water table elevations and ground water flow direction. The ground water elevations are summarized in Table 1. Our field procedures are described in Appendix A.
8. Measure combustible vapor concentrations in the airspace of the monitoring well casings of MW-1 through MW-7 on a quarterly basis using a Bacharach TLV Sniffer calibrated to hexane. The measurements are presented in Table 1. Our field procedures are described in Appendix A.
9. Obtain ground water samples from MW-1 through MW-7 on a quarterly basis for one or more of the following analyses: BETX, gasoline-, diesel- and heavy oil-range hydrocarbons and dissolved lead by EPA Method 7421.
10. Obtain samples of the purge and decontamination water stored on site in 55-gallon drums and submit the samples for one or more of the following analyses: BETX, oil and grease by EPA Method 413.2, and total lead by EPA Method 7421.

SUBSURFACE EXPLORATIONS

GENERAL

Unocal reported that Quality Petroleum Company demolished aboveground facilities and dismantled ASTs and associated product lines at the site prior to our visit on November 12, 1992. On November 12, a GeoEngineers representative observed two ASTs, product lines and one 280-gallon UST (underground storage tank) stored on site. The location and storage contents of the UST were not included on site plans provided to us by Unocal. Information provided by Quality Petroleum indicates that the UST was located south of the former office building as shown in Figure 1. GeoEngineers did not observe the removal of the UST or product lines, and did not sample in the excavation area.

Four of six AST footings not removed during site demolition resulted in restricted access to the proposed location of boring MW-7 within the former diked AST area. Because of limited access, MW-7 was drilled and installed outside the former diked AST area. A shallow subsurface soil sample (S-1) was obtained from within the former AST area. The approximate locations of monitoring well MW-7 and soil sample S-1 are shown in Figure 3.

SUBSURFACE SOIL AND GROUND WATER CONDITIONS

Subsurface soil conditions were explored by drilling boring MW-7 and obtaining soil sample S-1 on November 14, 1992. Details of the field exploration program and the boring/monitoring well log are presented in Appendix A.

Native gravel with silt, sand and occasional cobbles and boulders was encountered from the surface to a depth of approximately 4.5 feet below the ground surface at the boring exploration. Silty sand with varying amounts of gravel was encountered at a depth of Approximately 4.5 feet and, except for a silt lens between about 25.5 and 27.5 feet, extended to the base of the exploration, at a depth of about 36.5 feet below the ground surface.

Ground water conditions were explored by installing a monitoring well in boring MW-7. Construction details for the well are presented in Appendix A. GeoEngineers measured the depth to ground water and calculated the water table elevation in MW-7 on November 15, 1992. The ground water table was approximately 25.5 feet below the ground surface. Ground water monitoring results for MW-7 and other wells at the site are discussed in a subsequent section of this report.

SUBSURFACE CONTAMINATION

The potential presence of petroleum-related contamination in boring/monitoring well MW-7 and shallow subsurface soil sample S-1 were evaluated by field screening of soil samples, monitoring the water table interface in MW-7 for the potential presence of free (floating) product and chemical analysis of soil and ground water samples.

A moderate sheen was observed during field screening of soil sample S-1 and the soil sample obtained from MW-7 near the ground water table at a depth of approximately 26 feet. A headspace vapor concentration of 200 ppm (parts per million) was detected during field screening of soil sample S-1. No other evidence of contamination was detected by field screening. Field screening results are presented on the monitoring well log in Appendix A and in Table 3. Free product was not observed on the water table interface of MW-7.

Two soil samples from MW-7, obtained from depths of 26 and 28.5 feet, and soil sample S-1 obtained from a depth of 1 foot in the AST area, were submitted to the laboratory for chemical testing. The soil samples were analyzed for BETX, gasoline- and diesel-range hydrocarbons. The analyzed compounds either were not detected or were detected at concentrations less than the MTCA Method A cleanup level in the soil samples from MW-7. Xylenes, gasoline- and diesel-range hydrocarbons were detected at concentrations exceeding the soil cleanup levels in S-1. Benzene, ethylbenzene and toluene either were not detected or were detected at concentrations less than the soil cleanup levels in S-1. The soil chemical analytical data are summarized in Table 3. Laboratory reports and our review of the laboratory QC (quality control) documentation are presented in Appendix B.

A ground water sample was obtained from MW-7 on November 15, 1992. The sample was submitted to ATI for analysis of BETX, gasoline- and diesel-range hydrocarbons. Chemical analytical results are in a subsequent section of this report.

GROUND WATER MONITORING

MAY 1992

Field Measurements

A GeoEngineers representative measured depth to the water table and concentrations of combustible vapors in MW-1 through MW-6 on May 21, 1992. Field methods are described in Appendix A. The depths to ground water in the monitoring wells ranged from 22.85 to 23.40 feet below the ground surface. The corresponding ground water table elevations ranged from 77.24 feet to 77.38 feet with respect to a benchmark at the southeast corner of the oil/water separator. The benchmark was assigned as assumed elevation of 100 feet. The inferred ground water flow direction in May 1992 was toward the north, with a relatively flat gradient. Combustible vapor concentrations measured in the monitoring well casings of MW-1 through MW-4 and MW-6 were less than 400 ppm. The measured combustible vapor concentration in MW-5 was 1,100 ppm. The field measurements are summarized in Table 1. Water table elevations, water table contours, and the apparent direction of ground water flow determined from field measurements obtained in May 1992 are shown in Figure 1.

Ground Water Quality

Ground water samples were obtained from MW-1 through MW-6 on May 21, 1992 and submitted for analysis of the following: BETX; gasoline-, diesel- and heavy oil-range hydrocarbons; and dissolved lead (field-filtered samples). Laboratory analytical results are summarized in Table 2. Laboratory reports and our review of the laboratory QC documentation are presented in Appendix B.

Benzene, ethylbenzene and xylenes were detected at concentrations exceeding MTCA Method A ground water cleanup levels in the sample obtained from MW-5. Gasoline-range hydrocarbons were detected at concentrations exceeding the cleanup levels in the ground water samples obtained from MW-1 and MW-5. Diesel-range hydrocarbons were detected in ground water samples from MW-1, MW-3 and MW-5 at concentrations exceeding the cleanup level. Heavy oil-range hydrocarbons were detected in ground water samples obtained from MW-1, MW-3, MW-4, MW-5 and MW-6 at concentrations exceeding the cleanup level. Dissolved lead was detected at concentrations exceeding the cleanup level in ground water samples obtained from MW-1, MW-4 and MW-5. BETX; gasoline-range hydrocarbons, diesel-range hydrocarbons, heavy oil-range hydrocarbons and dissolved lead either were not detected or were detected at concentrations less than cleanup levels in the remaining ground water samples that were tested.

AUGUST 1992

Field Measurements

A GeoEngineers representative measured depth to the water table and concentrations of combustible vapors in MW-1 through MW-6 on August 19, 1992. Field methods are described in Appendix A. The depths to ground water in the monitoring wells ranged from 14.00 to 14.62 feet below the ground surface. The corresponding ground water table elevations ranged from 86.09 to 86.13 feet with respect to the assumed datum. The ground water gradient was relatively flat and the direction of ground water flow could not be inferred from water table elevations. Combustible vapor concentrations measured in the monitoring well casings of MW-2 through MW-4 and MW-6 were less than 400 ppm. Combustible vapor concentrations measured in MW-1 and MW-5 were 1,100 and 1,500 ppm, respectively. The field measurements are summarized in Table 1. Water table elevations determined from field measurements obtained in August 1992 are shown in Figure 2.

Ground Water Quality

Ground water samples were obtained from MW-1, MW-3, MW-5 and MW-6 on August 19, 1992 and submitted for analysis of BETX, gasoline- and diesel-range hydrocarbons and dissolved lead (field-filtered samples). Laboratory analytical results are summarized in Table 2. Laboratory reports and our review of laboratory QC documentation are presented in Appendix B.

Components of BETX were detected at concentrations exceeding the MTCA Method A cleanup levels in the ground water samples obtained from MW-1 and MW-5. Gasoline-range hydrocarbons were detected at a concentration exceeding cleanup levels in the ground water sample obtained from MW-5. Diesel-range hydrocarbons were detected in the ground water samples obtained from MW-1 and MW-3 at concentrations exceeding cleanup levels. The sample obtained from MW-5 for analysis by WTPH-D did not reach the laboratory intact. Dissolved lead was detected at concentrations exceeding the cleanup level in the ground water sample obtained from MW-1. BETX, gasoline- and diesel-range hydrocarbons, and dissolved lead either were not detected or were detected at concentrations less than cleanup levels in the remaining ground water samples that were tested.

NOVEMBER 1992

Field Measurements

A GeoEngineers representative measured depth to the water table and concentrations of combustible vapors in MW-1 through MW-3 and MW-5 through MW-7 on November 12 and November 15, 1992. Field methods are described in Appendix A. The depths to ground water in the monitoring wells ranged from 18.74 to 24.48 feet below the ground surface. The corresponding water table elevations ranged from 81.33 to 81.40 feet with respect to the assumed datum. The ground water gradient was relatively flat and the direction of ground water flow could not be inferred from water table elevations. Combustible vapor concentrations were less

than 400 ppm in the monitoring well casings of MW-2, MW-3, MW-5 and MW-6, but were 800 ppm in MW-1. The field measurements are summarized in Table 1. Water table elevations determined from field measurements obtained in November 1992 are shown in Figure 3.

Ground Water Quality

Ground water samples were obtained from MW-1 through MW-3, MW-5 and MW-6 on November 12 and from MW-7 on November 15, 1992. Monitoring well MW-2 was temporarily inaccessible for sampling. The samples were submitted for analysis of BETX and gasoline- and diesel-range hydrocarbons. Laboratory analytical results are summarized in Table 2. Laboratory reports and our review of laboratory QC documentation are presented in Appendix B.

Components of BETX and gasoline-range hydrocarbons were detected at concentrations exceeding MTCA Method A cleanup levels in the ground water samples obtained from MW-1 and MW-5. Diesel-range hydrocarbons were detected at concentrations equal to or exceeding the cleanup level in ground water samples obtained from MW-1 through MW-3, MW-5 and MW-7. BETX, gasoline- and diesel-range hydrocarbons either were not detected or were detected at concentrations less than cleanup levels in the remaining ground water samples that were tested.

PURGE AND DECONTAMINATION WATER CHARACTERIZATION

A GeoEngineers representative obtained samples of purge and decontamination water stored on site in 55-gallon drums on August 19 and November 13, 1992. The samples were obtained to characterize the water for disposal purposes and were analyzed for BETX, oil and grease by EPA method 413.2, and total lead by EPA Method 7421. Laboratory analytical results are summarized in Table 4. Laboratory reports and our review of laboratory QC documentation are presented in Appendix B.

CONCLUSIONS

The results of our previous studies indicate the presence of surface and subsurface petroleum-related soil contamination in the vicinity of the truck unloaders, the loading rack and the warehouse at Bulk Plant 0082. Sample S-1 was obtained and monitoring well MW-7 was installed to explore the soil and ground water conditions beneath the former tank farm area.

Monitoring well MW-7 was not installed inside the tank farm area as planned because of access restrictions. MW-7 was drilled as close to the tank farm area as was practical. Laboratory and field screening results did not indicate the presence of petroleum-related soil contamination in soil samples obtained from MW-7. Xylenes, gasoline-range hydrocarbons and diesel-range hydrocarbons were detected at concentrations exceeding the soil cleanup levels in sample S-1, obtained from a depth of 1 foot inside the tank farm area.

The results of our ground water monitoring conducted during the current and past reporting periods indicate that the ground water elevation beneath the site has fluctuated as much as 14 feet seasonally. The ground water gradient is relatively flat and varies in direction of flow. In our

opinion, fluctuations in the ground water elevations and the variable flow direction are related to changes in the water level of nearby Lake Chelan. Measurements of combustible vapor concentrations in the casings of monitoring wells MW-1 and MW-5 were greater than 1,000 ppm in August 1992.

BETX, gasoline-range hydrocarbons and diesel-range fuel hydrocarbons continue to be detected at concentrations exceeding MTCA Method A cleanup levels in the ground water samples obtained from MW-1 and MW-5 during the reporting period. Diesel-range hydrocarbons were also detected at concentrations exceeding cleanup levels in ground water samples from MW-2 (November 1992), MW-3 and MW-7 (November 1992) during this reporting period. Diesel-range hydrocarbons had not previously been detected in MW-2. In May 1992, heavy oil-range hydrocarbons were detected at concentrations exceeding cleanup levels in ground water samples obtained from MW-1, MW-3, MW-4, MW-5, and MW-6. Heavy-oil range hydrocarbons had not been previously detected in MW-4 and MW-6. Dissolved lead was detected at concentrations exceeding the cleanup level in ground water samples obtained from MW-1 and MW-5 during this reporting period. Lead had not previously been detected in MW-5.

RECOMMENDATIONS

We recommend that the ground water monitoring schedule be reduced to twice per year at the site. The monitoring program should include measurement of ground water levels and combustible vapor concentrations, and obtaining ground water samples for chemical analysis. We recommend that ground water samples obtained from the site in the future be analyzed for BETX and gasoline-, diesel- and oil-range hydrocarbons.

Concentrations of petroleum-related compounds in the ground water are less than the allowable concentrations for our Metro purge water discharge permit. After our next visit to the site, we will transport all purge water stored at the site to our office for disposal.

We recommend excavating a test pit in the former location of the 280-gallon UST south of the former office building. The test pit will be excavated to assess the possible presence of petroleum-related contamination in the vicinity of the UST.

Please call if you have any questions concerning this report.

Respectfully submitted,

GeoEngineers, Inc.

Norman L. Puri
Environmental Engineer

James A. Miller, P.E.
Principal

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TABLE 1
SUMMARY OF GROUND WATER ELEVATIONS AND COMBUSTIBLE VAPOR CONCENTRATIONS

	Date	Monitoring Well Number							Inferred Direction of Ground Water Flow
		MW-1	MW-2	MW-3	MW-4	MW-5	MW-6	MW-7	
Ground Water Elevations (feet)	12/04/89	81.24	81.27	81.29	Note[1]	Note[1]	Note[1]	Note[2]	East
	04/09/91	78.00	78.03	78.05	78.00	78.00	78.02	Note[2]	East, southeast
	04/28/91	78.01	78.01	78.02	78.00	78.01	78.01	Note[2]	East, southeast
	07/20/91	86.43	86.44	86.43	86.44	86.41	86.44	Note[2]	Southeast
	08/27/91	86.22	86.24	86.22	86.22	86.22	86.24	Note[2]	Southeast
	11/23/91	80.00	80.02	80.01	80.01	80.01	80.06	Note[2]	Southeast
	02/20/92	dry	dry	72.15	dry	72.70	72.67	Note[2]	West
	05/21/92	77.31	77.27	77.30	77.38	77.31	77.24	Note[2]	North
	08/19/92	86.09	86.12	86.10	86.09	86.13	86.10	Note[2]	Undetermined
	11/15/92	81.36	81.38	81.38	Note[3]	81.36	81.40	81.33	Undetermined
Combustible Vapor Concentrations (ppm)	12/04/89	420	<400	<400	–	–	–	Note[2]	
	04/09/91	900	<400	<400	<400	>10,000	<400	Note[2]	
	04/28/91	–	–	–	–	–	–	Note[2]	
	07/20/91	–	–	–	–	–	–	Note[2]	
	08/27/91	<400	<400	<400	<400	<400	<400	Note[2]	
	11/23/91	410	<400	<400	<400	420	<400	Note[2]	
	02/20/92	<400	<400	<400	<400	<400	<400	Note[2]	
	05/21/92	<400	<400	<400	<400	1,100	<400	Note[2]	
	08/19/92	1,100	<400	<400	<400	1,500	<400	Note[2]	
	11/12/92	800	<400	<400	Note[3]	<400	<400	Note[2]	

Notes:

[1]MW-4, MW-5 and MW-6 were installed in April 1991.

[2]MW-7 was installed in November 1992.

[3]MW-4 was inaccessible on November 12 and November 15, 1992.

Field procedures are described in Appendix A.

ppm = parts per million

"–" = not measured

TABLE 2 (Page 1 of 3)
SUMMARY OF GROUND WATER CHEMICAL ANALYTICAL DATA

Monitoring Well Number	Date Sampled	BETX[1] (µg/l)				Gasoline-range Hydrocarbons[2] (mg/l)	Diesel-range Hydrocarbons[3] (mg/l)	Heavy Oil-range Hydrocarbons[4] (mg/l)	Dissolved Lead[5] (mg/l)
		B	E	T	X				
MW-1	12/04/89	270	94	150	700	–	–	3.8	–
	04/09/91	280	41	50	270	2.8	<1	–	0.010
	08/27/91	84	6.8	8.3	57	3	15	5.3	0.012
	11/23/91	250	43	71	350	12[6]	19[6]	14	0.059
	02/20/92[7]	–	–	–	–	–	–	–	–
	05/21/92	1.2	0.57	<0.5	4.3	1.2	9.9	25	0.019
	08/19/92	28	4.7	5.0	24	0.57	16	–	0.017
	11/12/92	75	19	53	150	1.6	12	–	–
[DUP]	11/12/92	69	4.1	43	150	1.4	–	–	–
MW-2	12/04/89	ND	ND	ND	ND	–	–	0.23	–
	04/09/91	<0.5	<0.5	<0.5	<0.5	<1.0	<1	–	0.009
	08/27/91	<0.5	<0.5	<0.5	<0.5	<1	<1	<1	<0.002
	11/23/91	<0.5	<0.5	<0.5	<0.5	<1	<1	<1	<0.003
	02/20/92[7]	–	–	–	–	–	–	–	–
	05/21/92	<0.5	<0.5	<0.5	<0.5	<0.05	<0.5	<1.0	0.0033
	08/19/92	–	–	–	–	–	–	–	–
	11/12/92	<0.5	<0.5	<0.5	<0.5	<0.1	1.0	–	–
MW-3	12/04/89	ND	ND	ND	ND	–	–	9.3	–
	04/09/91	3.9	<0.5	<0.5	1.6	<1	<1	–	0.012
	08/27/91	<0.5	<0.5	<0.5	<0.5	<1	<1	<1	<0.002
	11/23/91	1.2	<0.5	<0.5	<0.5	<1	<1	<1	<0.003
	02/20/92	<0.5	<0.5	<0.5	<0.5	<1.0	12	6.6	<0.003
	05/21/92	1.0	<0.5	<0.5	<0.5	0.1	3.5	9.0	0.0029
	08/19/92	4.4	<0.5	<0.5	<1.0	<0.05	1.8	–	<0.002
	11/12/92	<0.5	<0.5	<0.5	<0.5	<0.1	1.8	–	–
MTCA Method A Cleanup Levels		5	30	40	20	1[8]			0.005

Notes appear on page 3 of 3.

TABLE 2 (Page 2 of 3)

Monitoring Well Number	Date Sampled	BETX[1] (µg/l)				Gasoline-range Hydrocarbons[2] (mg/l)	Diesel-range Hydrocarbons[3] (mg/l)	Heavy Oil-range Hydrocarbons[4] (mg/l)	Dissolved Lead[5] (mg/l)
		B	E	T	X				
MW-4[9]	12/04/89	–	–	–	–	–	–	–	–
	04/09/91	<0.5	<0.5	<0.5	<0.5	<1	<1	–	0.045
	08/27/91	<0.5	<0.5	<0.5	<0.5	<1	<1	<1	0.015
	11/23/91	<0.5	<0.5	<0.5	<0.5	<1	<1	<1	0.015
	02/20/92[7]	–	–	–	–	–	–	–	–
	05/21/92	<0.5	<0.5	<0.5	<0.5	<0.05	0.60	2.1	0.041
	08/19/92	–	–	–	–	–	–	–	–
	11/12/92	–	–	–	–	–	–	–	–
MW-5[9]	12/04/89	–	–	–	–	–	–	–	–
	04/09/91	300	78	20	410	3.2	<1	–	<0.005
	08/27/91	270	38	21	460	7	20	2.5	<0.004
	11/23/91	280	100	12	350	6	17	9.4	<0.003
	02/20/92	220	120	28	440	4	8	5.2	<0.003
	05/21/92	160	170	11	190	2.5	9.9	6.8	0.0053
[DUP-1]	05/21/92	160	160	14	170	2.3	10	6.4	–
	08/19/92	130	70	6.1	180	2.2	Note[10]	–	<0.002
	11/12/92	91	<0.5	5.8	110	2.1	15	–	–
MW-6[9]	12/04/89	–	–	–	–	–	–	–	–
	04/09/91	<0.5	<0.5	0.6	<0.5	<1	<1	–	<0.005
	08/27/91	<0.5	<0.5	<0.5	<0.5	<1	<1	<1	<0.002
	11/23/91	<0.5	<0.5	<0.5	<0.5	<1	<1	<1	<0.003
	02/20/92	<0.5	<0.5	<0.5	<0.5	<1	<1	<1	<0.003
	05/21/92	<0.5	<0.5	<0.5	<0.5	<0.05	<0.50	1.7	0.0047
	08/19/92	<0.5	<0.5	<0.5	<1.0	<0.05	<0.25	–	<0.002
	11/12/92	<0.5	<0.5	<0.5	<0.5	<0.1	<0.50	–	–
MW-7[11]	11/15/92	<0.5	<0.5	<0.5	0.7	<0.1	1.7	–	–
MTCA Method A Cleanup Levels		5	30	40	20		1[8]		0.005

Notes appear on page 3 of 3.

TABLE 2 (Page 3 of 3)

Notes:

[1]Samples analyzed by EPA Method 8020. B = benzene, E = ethylbenzene, T = toluene, X = total xylenes

[2]Samples collected prior to May 1992 analyzed for gasoline-range hydrocarbons by modified EPA Method 8015. Samples collected May 1992 and later analyzed by Ecology Method WTPH-G. Samples collected from wells MW-1, MW-2 and MW-3 on April 9, 1991 were analyzed by both methods. The WTPH-G analyses yielded higher concentrations for some of the samples collected on April 9, and the results from this method's analyses are listed in the table.

[3]Samples collected prior to May 1992 were analyzed by modified EPA Method 8015. Samples collected May 1992 and later analyzed by Ecology Method WTPH-D.

[4]Samples collected prior to May 1992 were analyzed by EPA Method 418.1. Samples collected May 1992 and later were analyzed by Ecology Method WTPH-418.1.

[5]Analyzed by EPA Method 7421.

[6]For 11/23/91 samples, second analyses for fuel hydrocarbons used because of lower detection limit.

[7]Monitoring wells MW-1, MW-2 and MW-4 were dry during our February 20, 1992 site visit.

[8]The MTCA Method A ground water cleanup level for the total of gasoline-, diesel-, and heavy oil-range hydrocarbons is 1 mg/l.

[9]On 12/04/89, monitoring wells MW-4, MW-5 and MW-6 had not yet been installed.

[10]Sample container was broken during transport to laboratory.

[11]Monitoring well MW-7 was installed on 11/15/92.

µg/l = micrograms per liter

mg/l = milligrams per liter

ND = not detected above laboratory reporting limit

"--" = not tested

TABLE 3
SUMMARY OF SOIL FIELD SCREENING AND CHEMICAL ANALYTICAL DATA
SUBSURFACE EXPLORATIONS

Sample Number	Source[1]	Date Sampled	Depth (feet)	Field Screening Results[2]		BETX[3] (mg/kg)				Gasoline-range Hydrocarbons[4] (mg/kg)	Diesel-range Hydrocarbons[5] (mg/kg)
				Headspace Vapors (ppm)	Water Sheen	B	E	T	X		
MW-7-10	Boring MW-7	11/14/92	26	<100	MS	<0.032	<0.032	0.049	<0.032	<6	<36
MW-7-11	Boring MW-7	11/14/92	28.5	<100	SS	<0.032	<0.032	0.040	<0.032	<6	<32
S-1	Beneath former ASTs	11/14/92	1	200	MS	<0.027	1.2	0.51	590	15,000	1,800
MTCA Method A soil cleanup level						0.5	20.0	40.0	20.0	100.0	200.0

Notes:

[1]Approximate locations of boring/monitoring well MW-7 and soil sample S-1 shown in Figure 3.

[2]Field screening methods described in Appendix A. SS = slight sheen, MS = moderate sheen

[3]B = benzene, E = ethylbenzene, T = toluene, X = xylenes. BETX was analyzed by EPA Method 8020.

[4]Gasoline-range hydrocarbons analyzed by Ecology Method WTPH-G.

[5]Diesel-range hydrocarbons analyzed by Ecology Method WTPH-D.

ppm = parts per million

mg/kg = milligrams per kilogram

TABLE 4
SUMMARY OF CHEMICAL ANALYTICAL DATA
PURGE AND DECONTAMINATION WATER

Sample Number	Date Sampled	BETX[1] (µg/l)				Oil and Grease[2] (mg/l)	Total Lead[3] (mg/l)
		B	E	T	X		
Drum-1	08/19/92	6.0	2.2	1.6	6.1	1.3	11.00
Drum	11/13/92	11.0	3.7	2.7	18.0	1.2	0.0052

Notes:

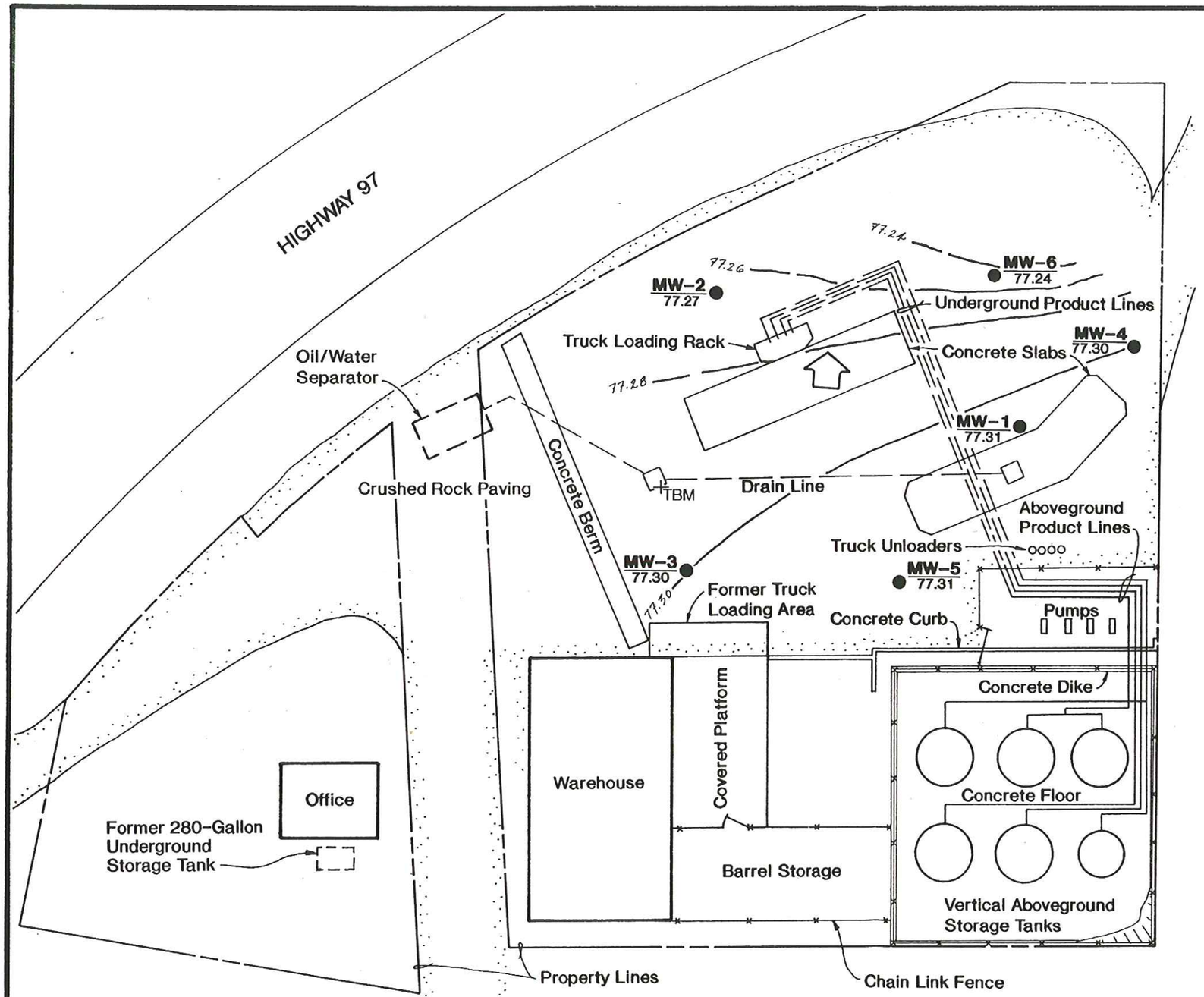
[1]Samples analyzed by EPA Method 8020. B = benzene, E = ethylbenzene, T = toluene and X = total xylenes.

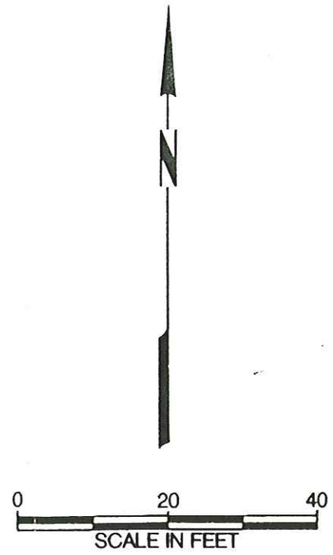
[2]Samples analyzed by EPA Method 413.2.

[3]Samples analyzed by EPA Method 7421.

µg/l = micrograms per liter

mg/l = milligrams per liter





EXPLANATION:

MW-1 / 77.31 — MONITORING WELL
GROUND WATER ELEVATION (IN FEET) ON 05/21/92

77.30 — GROUND WATER CONTOUR ON 05/21/92

GENERAL DIRECTION OF GROUND WATER FLOW ON 05/21/92

TBM — TEMPORARY BENCHMARK AT S.E. CORNER OF OIL/WATER SEPARATOR; ASSUMED ELEVATION OF 100.00 FEET

Notes.
1. The locations of all features shown are approximate.
2. All facilities were demolished and removed in November 1992.

Reference: Drawing entitled "Chelan, Wash., Marketing Branch, General Arrangement," revision dated 10/08/85, by Unocal.

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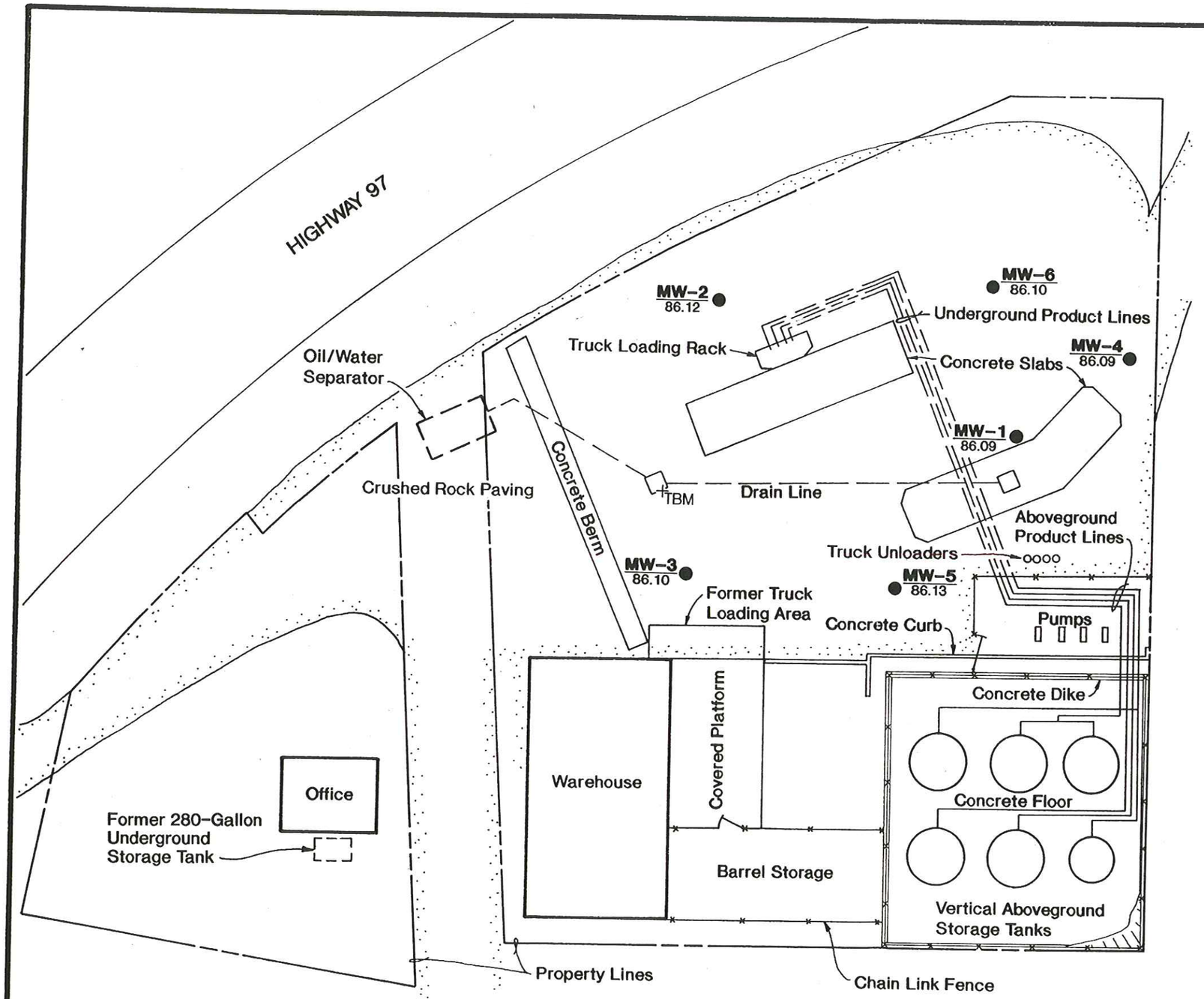
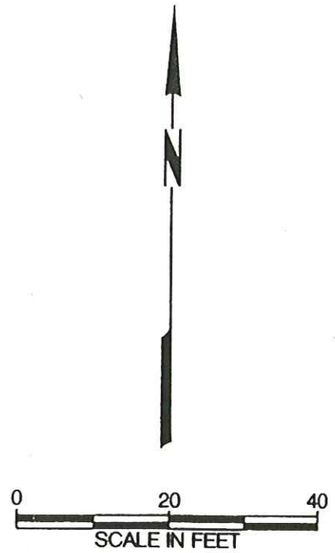
GROUND WATER ELEVATIONS ON 05/21/92

FIGURE 1

0161-128-R04 NLP:BDH 5/6/92 (B)





EXPLANATION:

MW-1 / 86.09 ● MONITORING WELL
GROUND WATER ELEVATION (IN FEET) ON 08/19/92

+TBM TEMPORARY BENCHMARK AT S.E. CORNER OF OIL/WATER SEPARATOR; ASSUMED ELEVATION OF 100.00 FEET

Notes:
1. The locations of all features shown are approximate.
2. Direction of ground water flow undetermined.
3. All facilities were demolished and removed in November 1992.

Reference: Drawing entitled "Chelan, Wash., Marketing Branch, General Arrangement," revision dated 10/08/85, by Unocal.

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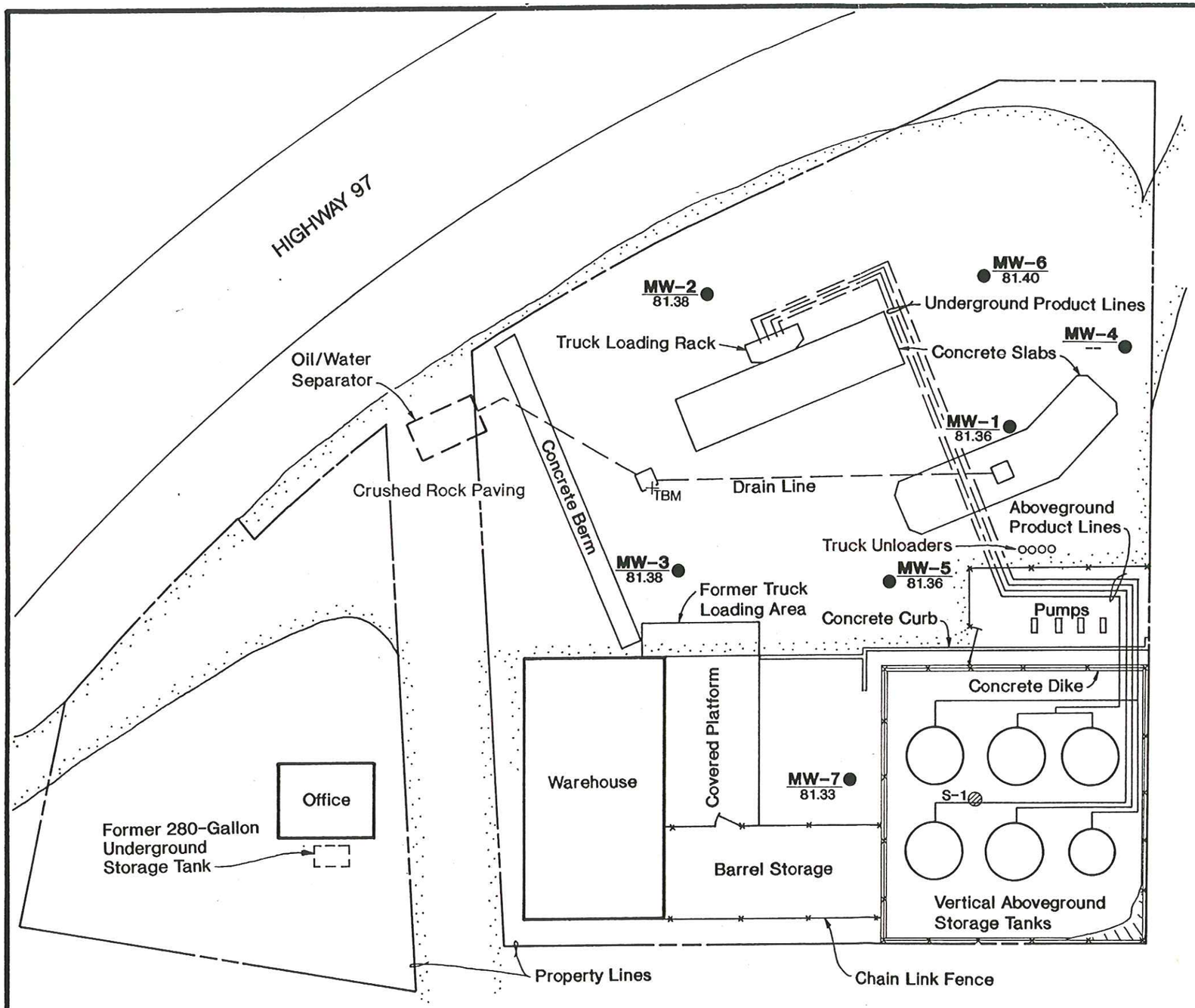
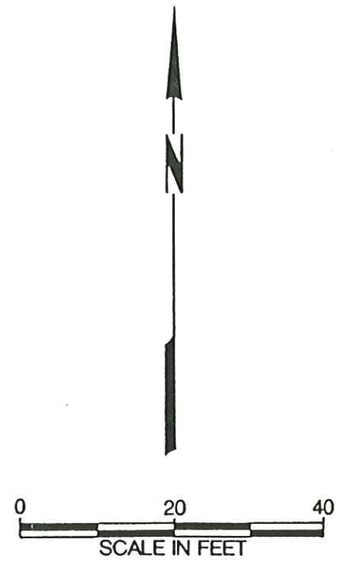
GROUND WATER ELEVATIONS ON 08/19/92

FIGURE 2

0161-228-R04 NLP:BDH 5/6/92 (B)





EXPLANATION:

MW-1 / 81.36	MONITORING WELL GROUND WATER ELEVATION (IN FEET) ON 11/15/92
--	NOT MEASURED
S-1	SOIL SAMPLE OBTAINED ON 11/14/92
TBM	TEMPORARY BENCHMARK AT S.E. CORNER OF OIL/WATER SEPARATOR; ASSUMED ELEVATION OF 100.00 FEET

Notes:
1. MW-4 was covered and ground water elevation was not measured.
2. All facilities were demolished and removed in November 1992.
3. The locations of all features shown are approximate.
4. Direction of ground water flow undetermined.

Reference: Drawing entitled "Chelan, Wash., Marketing Branch, General Arrangement," revision dated 10/08/85, by Unocal.

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GROUND WATER ELEVATIONS ON 11/15/92

FIGURE 3

0161-228-R04 NLP:BDH 5/6/92 (B)

APPENDIX A

APPENDIX A

FIELD PROCEDURES

DRILLING AND SOIL SAMPLING PROCEDURES

Subsurface conditions in the vicinity of the former ASTs at the site were explored by drilling boring MW-7 and by obtaining a shallow subsurface soil sample (S-1) at the approximate locations shown in Figure 3. Boring MW-7 was drilled on November 14, 1992 to a depth of approximately 36.5 feet using air rotary drilling equipment owned and operated by Holt Testing. The drilling and soil sampling equipment was cleaned with a hot-water pressure washer prior to drilling. The soil sampling equipment was decontaminated before each sampling attempt with two TSP (trisodium phosphate) solution washes and a distilled water rinse. Drill cuttings and decontamination water were stored on site in 55-gallon drums pending disposal.

A representative from our staff established the boring location, examined and classified the soils encountered, and prepared a detailed log of the boring. Soils encountered were classified visually in general accordance with ASTM D-2488-90, which is described in Figure A-1. An explanation of the boring log symbols is presented in Figure A-2. The boring log is presented in Figure A-3.

Soil samples were obtained from the boring using a Dames & Moore split-barrel sampler (2.4-inch ID) lined with decontaminated brass sleeves. The sampler was driven 18 inches by a 300-pound weight falling a vertical distance of approximately 30 inches. The number of blows needed to advance the sampler the final 12 inches or other specified intervals is indicated to the left of the corresponding sample notations on the boring log.

The shallow subsurface soil sample was obtained on November 14, 1992 by digging a shallow hole to a depth of approximately one foot below the ground surface. The sample (S-1) was obtained from the base of the hole using a sterile glove.

Soil samples obtained from the boring and the shallow subsurface soil sample (S-1) were separated into two portions. The first portion was placed in a plastic bag for field screening. The second portion of two samples was selected from the boring for chemical analysis were capped in the brass sleeves. The samples that tested are denoted in our boring log with a "CA." Samples selected for analysis were placed in a cooler with ice for transport to the laboratory.

FIELD SCREENING PROCEDURES

Soil samples obtained from the boring and the shallow subsurface soil sample (S-1) were split into two portions. One portion of each sample was retained to be field screened for petroleum-related contamination using (1) visual screening, (2) water sheen screening, and (3) headspace vapor screening using the Bacharach TLV Sniffer calibrated to hexane. Field screening results are used as a general guideline to delineate areas of potential petroleum-related

contamination. In addition, field screening results are used to aid in the selection of soil samples for chemical analysis. The results of headspace and/or water sheen screening are included in Table 3.

Visual screening consists of inspecting the soil for the presence of stains indicative of residual hydrocarbons. Visual screening is generally more effective in detecting the presence of heavier 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 contamination at 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.
Slight Sheen (SS)	Light, colorless, dull sheen; spread is irregular, not rapid; dissipates rapidly.
Moderate Sheen (MS)	Light to heavy sheen, may have some color/iridescence; spread is irregular to flowing, may be rapid; few remaining areas of no sheen on water surface.
Heavy Sheen (HS)	Heavy sheen with color/iridescence; spread is rapid; entire water surface may be covered with sheen.

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 the Bacharach TLV Sniffer is inserted in the bag and the TLV Sniffer measures the concentration of combustible vapor in the air removed from the sample headspace. The TLV Sniffer measures 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.

Field screening results are site-specific and vary with temperature, soil type, soil moisture content and type of contaminant.

MONITORING WELL CONSTRUCTION

A two-inch-diameter Schedule 40 PVC (polyvinyl chloride) pipe was installed in boring MW-7 at the completion of drilling. The lower portion of the PVC pipe is machine-slotted (0.02-inch slot width) to allow entry of hydrocarbon vapors, ground water and free product into the well casing. Medium sand was placed in the borehole annulus surrounding the slotted portion of the PVC pipe. The well casing is protected with a locking flush-grade monument. Monitoring well construction is shown in Figure A-3.

The monitoring well screen was developed by removing at least five well volumes of water from the well with a stainless steel bailer. Development water was contained on site in a 55-gallon drum pending disposal. We determined the elevation of the well casing to the nearest 0.01 foot using an engineer's level on November 15, 1992. Monitoring well MW-7 was surveyed with respect to the casing rim elevations of MW-3 and MW-5. The elevations of MW-3

PURGE AND DECONTAMINATION WATER SAMPLING

Water samples were obtained from purge and decontamination water stored on site in 55-gallon drums on August 13 and November 19, 1992. The samples were obtained by lowering a disposable bailer into the drum. The water samples were transferred in the field to laboratory-prepared sample containers and placed in a cooler with ice for transport to the laboratory.

SOIL CUTTINGS

Four drums of soil cuttings remain on site.

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	MH	SILT OF HIGH PLASTICITY, ELASTIC SILT
			CH	CLAY OF HIGH PLASTICITY, FAT CLAY
		ORGANIC	OH	ORGANIC CLAY, ORGANIC SILT
HIGHLY ORGANIC SOILS			PT	PEAT

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

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SOIL CLASSIFICATION SYSTEM

FIGURE A-1

LABORATORY TESTS:

CA Chemical Analysis

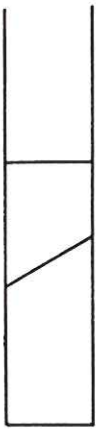
FIELD SCREENING TESTS:

Headspace vapor concentration data given in parts per million

Sheen classification system:

NS No Visible Sheen
SS Slight Sheen
MS Moderate Sheen
HS Heavy Sheen
NT Not Tested

SOIL GRAPH:



SM Soil Group Symbol (See Note 2)

Distinct Contact Between Soil Strata

Gradual or Approximate Location of Change Between Soil Strata

Water Level

Bottom of Boring

BLOW-COUNT/SAMPLE DATA:

Blows required to drive a 2.4-inch I.D. split-barrel sampler 12 inches or other indicated distances using a 300-pound hammer falling 30 inches.

22 ■ Location of relatively undisturbed sample

12 ⊠ Location of disturbed sample

17 □ Location of sampling attempt with no recovery

Blows required to drive a 1.5-inch I.D. (SPT) split-barrel sampler 12 inches or other indicated distances using 140-pound hammer falling 30 inches.

10 ◨ Location of sample obtained in general accordance with Standard Penetration Test (ASTM D-1586) procedures

26 ◫ Location of SPT sampling attempt with no recovery

▤ Location of grab sample

"P" indicates sampler pushed with weight of hammer or against weight of drill rig.

NOTES:

1. The reader must refer to the discussion in the report text, the Key to Boring Log Symbols and the exploration logs for a proper understanding of subsurface conditions.

2. Soil classification system is summarized in Figure A-1.

GEI 121-90

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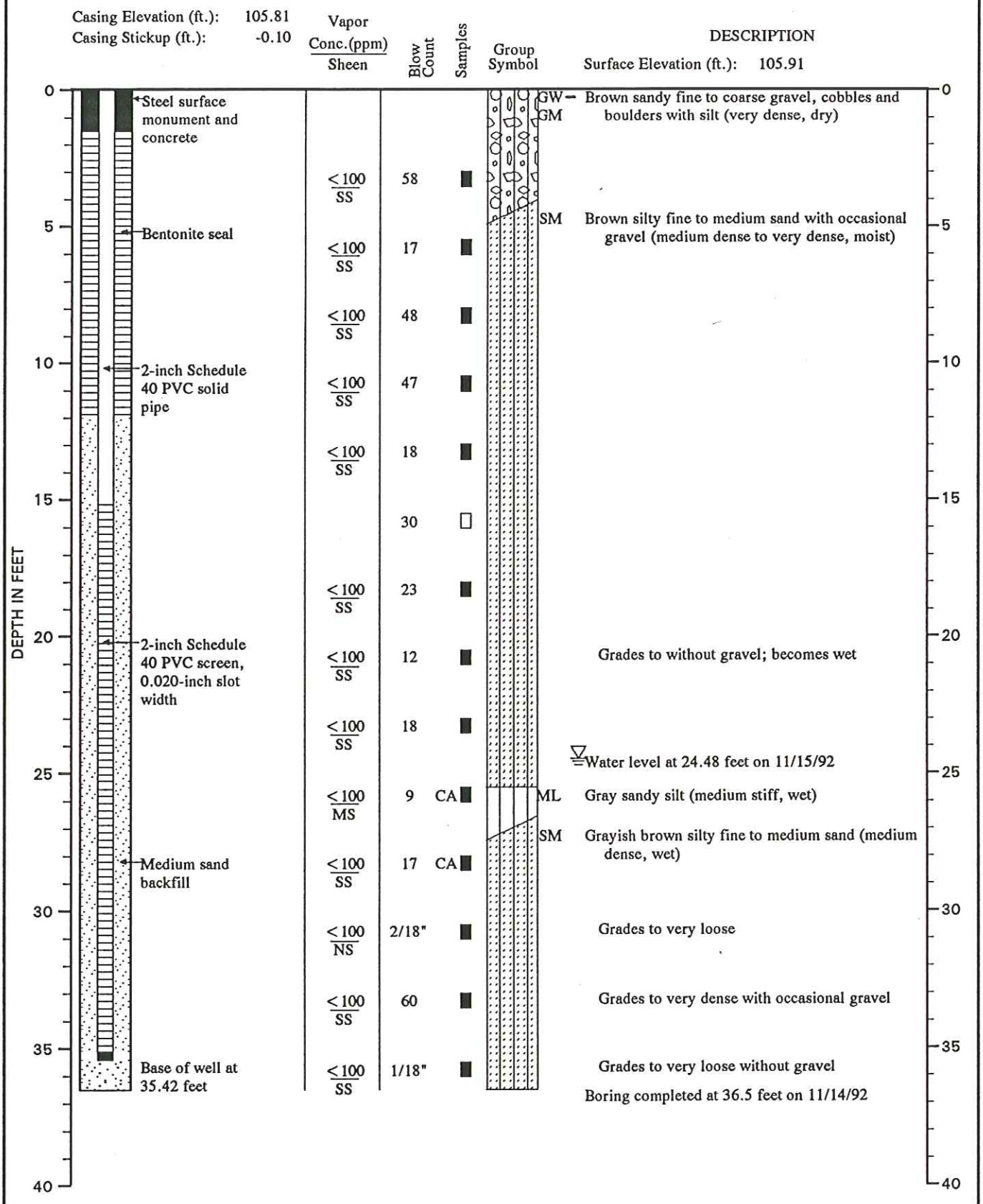
KEY TO BORING LOG SYMBOLS

FIGURE A-2

MONITORING WELL NO. MW-7



Note: See Figure A-2 for explanation of symbols

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LOG OF MONITORING WELL

FIGURE A-3

:NLP:CAH:CMS 3/22/93

0161-228-B04

APPENDIX B

APPENDIX B

CHEMICAL ANALYTICAL PROGRAM

ANALYTICAL METHODS

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

Analyte	Technique/Equipment	Method
Aromatic Volatile Organic Compound (BETX)	Gas Chromatography/ Photoionization Detector	EPA 8020
Gasoline-range Hydrocarbons	Gas Chromatography/ Flame Ionization Detector	Ecology WTPH-G
Diesel-range Hydrocarbons	Gas Chromatography/ Flame Ionization Detector	Ecology WTPH-D
Heavy Oil-range Hydrocarbons	Infrared Spectrophotometry	Ecology WTPH-418.1 Modified
Oil and Grease	Infrared Spectrophotometry	EPA Method 413.2
Lead	Graphite Furnace/Atomic Absorption Spectroscopy and Cold Vapor/Atomic Absorption Spectroscopy	EPA 7421

Analytical results and laboratory QA/QC (quality assurance/quality control) records are included in this attachment. The analytical results are also summarized in the text and Tables 2, 3 and 4 of the report.

ANALYTICAL DATA REVIEW

Data Quality Goals

NCA and ATI maintain internal quality assurance programs as documented in their laboratory quality assurance manuals. NCA and ATI use a combination of blanks, surrogate percent recovery, duplicates, matrix spike recovery and matrix spike duplicate recovery to evaluate the validity of analytical results. NCA and ATI also use 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 most water samples and to all soil samples prior to extraction and analysis for organic compounds to monitor sample handling procedures, matrix effects and purging efficiency. Any surrogate recoveries that were outside the control limits are summarized below.

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. Although not required, NCA provided BS/BSD (blank spike/blank spike duplicate) data for analysis of WTPH-G, WTPH-D and oil and grease in August 1992. ATI provided BS/BSD data for most analyses performed in November 1992. Any MS/MSD or BS/BSD recoveries that were outside the control limits are summarized below.

Duplicates. Duplicates were to be analyzed during the inorganic analyses and Ecology Method analyses to monitor matrix effects on method reproducibility. Duplicate data was not provided by NCA for analyses of WTPH-G, WTPH-D, WTPH-418.1 Modified and lead in May 1992. ATI did not provide duplicate data for the analysis of WTPH-D and 413.2 in November 1992 because they were not provided with enough sample. Method reproducibility for these tests could not be evaluated. NCA did provide MS/MSD data for the WTPH-D, WTPH-418.1 and lead analyses; ATI provided BS/BSD data for the WTPH-D and 413.2 analyses. No relative percent differences (RPDS) were outside the control limits.

Holding Times. All samples were extracted and analyzed within the recommended holding times.

Blanks. Laboratory blanks were analyzed for contaminants that may have been introduced during sample analysis. No blank data were provided by ATI for November 17, 1992 analysis of WTPH-D. No contaminants were detected in the blanks from data provided.

Data Quality Exceptions

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

Analyte/ Sample Number	Data Quality Problem	Evaluation
BETX (11/92) MW-1 (water) MW-2 MW-5 MW-7	MS recovery of xylenes above control limits.	Analyte was detected in MW-1, MW-5 and MW-7. Results may be biased high. Acceptable method performance was demonstrated through surrogate recovery, MSD RPD and BS/BSD recovery and RPD within control limits.
BETX (11/14/92) S-1 (soil)	Surrogate recovery above control limits.	Analyte was detected in S-1. Results may be biased high. Acceptable method performance was demonstrated through MS/MSD and BS/BSD recoveries and RPDs within control limits.

SUMMARY

The analytical results for this project were reviewed for conformance with the data quality goals. The data quality problems encountered are summarized above. Acceptable method performance was demonstrated through other quality control parameters provided. For these cases, the data are acceptable for semiquantitative use in this report.

As mentioned above, the following quality control elements were not performed:

Quality Control Element	Date Sampled	Analysis
Duplicate	05/21/92	Lead (7421) Gasoline-range hydrocarbons (WTPH-G) Diesel-range hydrocarbons (WTPH-D) Oil-range hydrocarbons (WTPH-418.1)
Duplicate	11/12/92 11/15/92	Diesel-range hydrocarbons (WTPH-D) Oil and Grease (413.2)

Because these quality control elements were not performed, GeoEngineers cannot provide a definitive assessment of the quality of all of the chemical analytical data used to form conclusions in this report.

NORTH CREEK ANALYTICAL

18939 120th Avenue N.E., Suite 101 • Bothell, WA 98011-2569
Phone (206) 481-9200 • FAX (206) 485-2992

GeoEngineers, Inc.	Client Project ID:	Unocal/Chelan, #161-228-R04	Sampled:	May 21, 1992
8410 154th Avenue N.E.	Matrix Descript:	Water	Received:	May 26, 1992
Redmond, WA 98052	Analysis Method:	EPA 418.1 (I.R. with clean-up)	Extracted:	May 28, 1992
Attention: Norman Puri	First Sample #:	205-1319	Analyzed:	May 29, 1992
			Reported:	Jun 10, 1992

TOTAL RECOVERABLE PETROLEUM HYDROCARBONS (WTPH-418.1)

Sample Number	Sample Description	Petroleum Oil mg/L (ppm)
205-1319	MW-1	25
205-1320	MW-2	N.D.
205-1321	MW-3	9.0
205-1322	MW-4	2.1
205-1323	MW-5	6.8
205-1324	MW-6	1.7
205-1326	DUP 1	6.4
BLK052892	Method Blank	N.D.

Detection Limits:	1.0

Analytes reported as N.D. were not present above the stated limit of detection.

NORTH CREEK ANALYTICAL inc

Scot Cocanour
Laboratory Director

NORTH CREEK ANALYTICAL

18939 120th Avenue N.E., Suite 101 • Bothell, WA 98011-2569
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GeoEngineers, Inc.	Client Project ID:	Unocal/Chelan, #161-228-R04	Sampled:	May 21, 1992
8410 154th Avenue N.E.	Matrix Descript:	Water	Received:	May 26, 1992
Redmond, WA 98052	Analysis Method:	EPA 3510/8015	Extracted:	May 28, 1992
Attention: Norman Puri	First Sample #:	205-1319	Analyzed:	5/29-6/5/1992
			Reported:	Jun 10, 1992

TOTAL PETROLEUM HYDROCARBONS (WTPH-D)

Sample Number	Sample Description	Extractable Hydrocarbons mg/L (ppm)	Surrogate Recovery %
205-1319	MW-1	9.9	55
205-1320	MW-2	N.D.	57
205-1321	MW-3	3.5	114
205-1322	MW-4	0.60	105
205-1323	MW-5	9.9	64
205-1324	MW-6	N.D.	60
205-1326	DUP 1	10	65
BLK052892	Method Blank	N.D.	60

Detection Limits:	**0.50**

Extractable Hydrocarbons are quantitated as diesel range organics (nC8 - nC24). Surrogate recovery reported is for 2-Fluorobiphenyl.
Analytes reported as N.D. were not present above the stated limit of detection.

NORTH CREEK ANALYTICAL inc

Scot Cocanour
Laboratory Director

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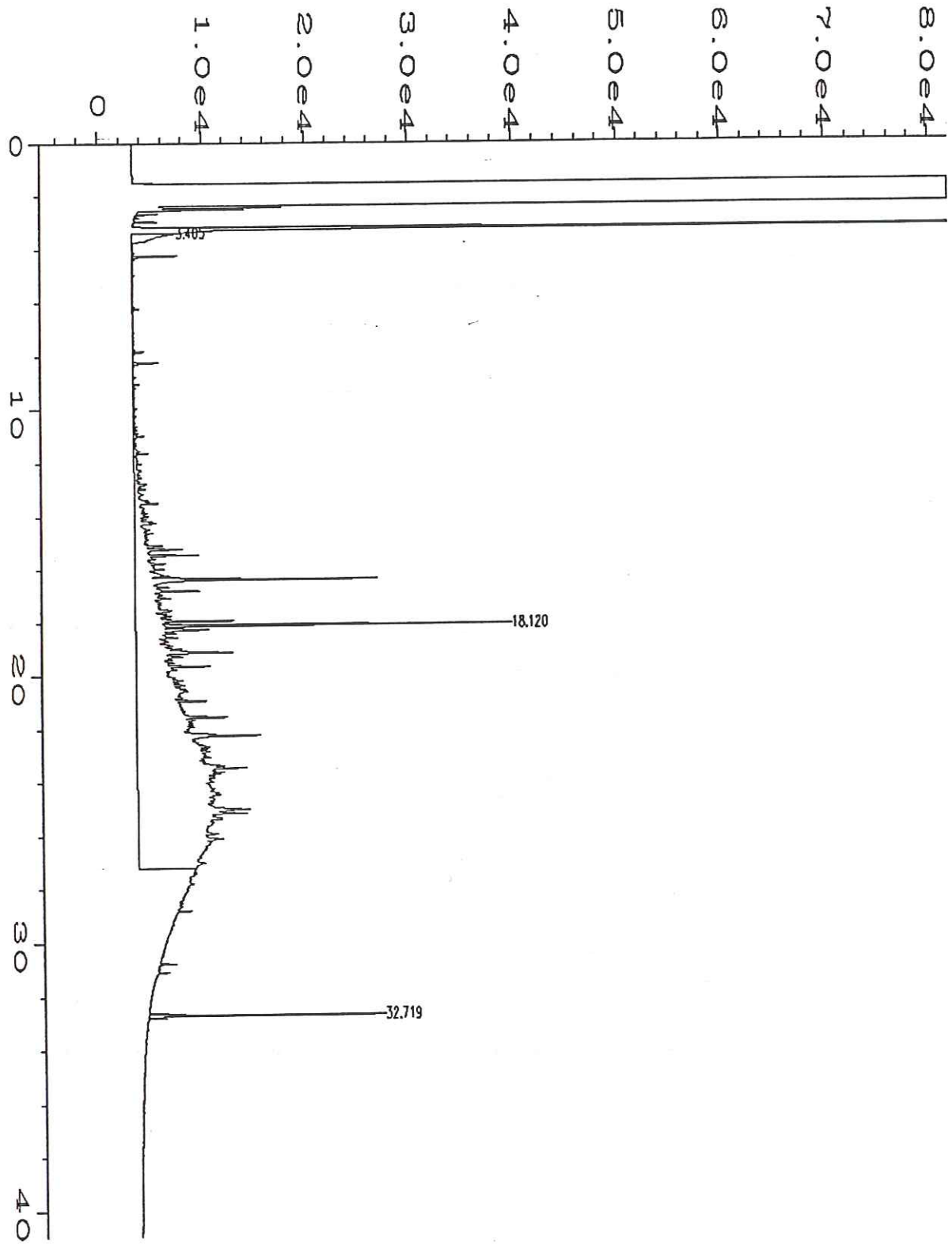

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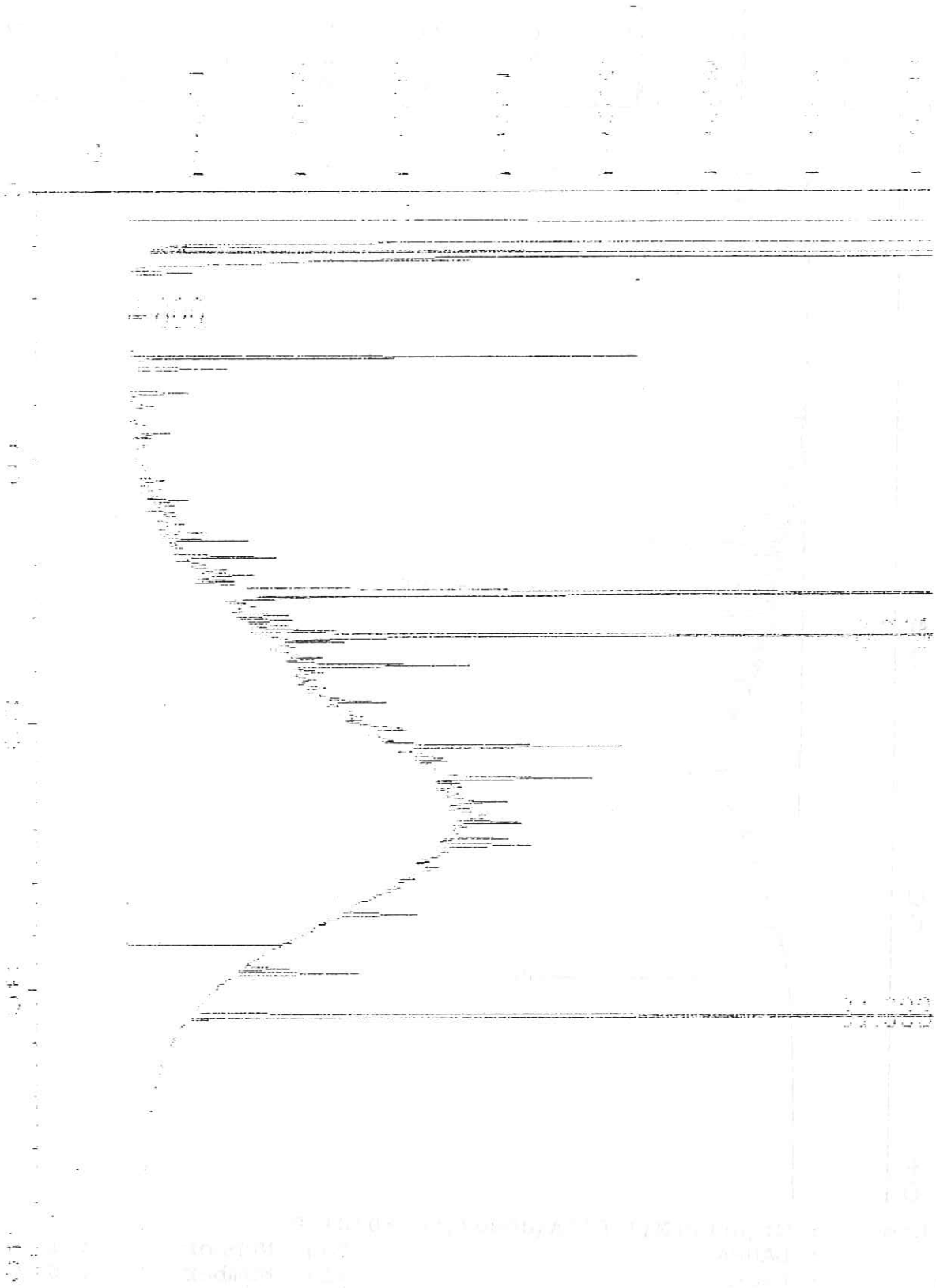
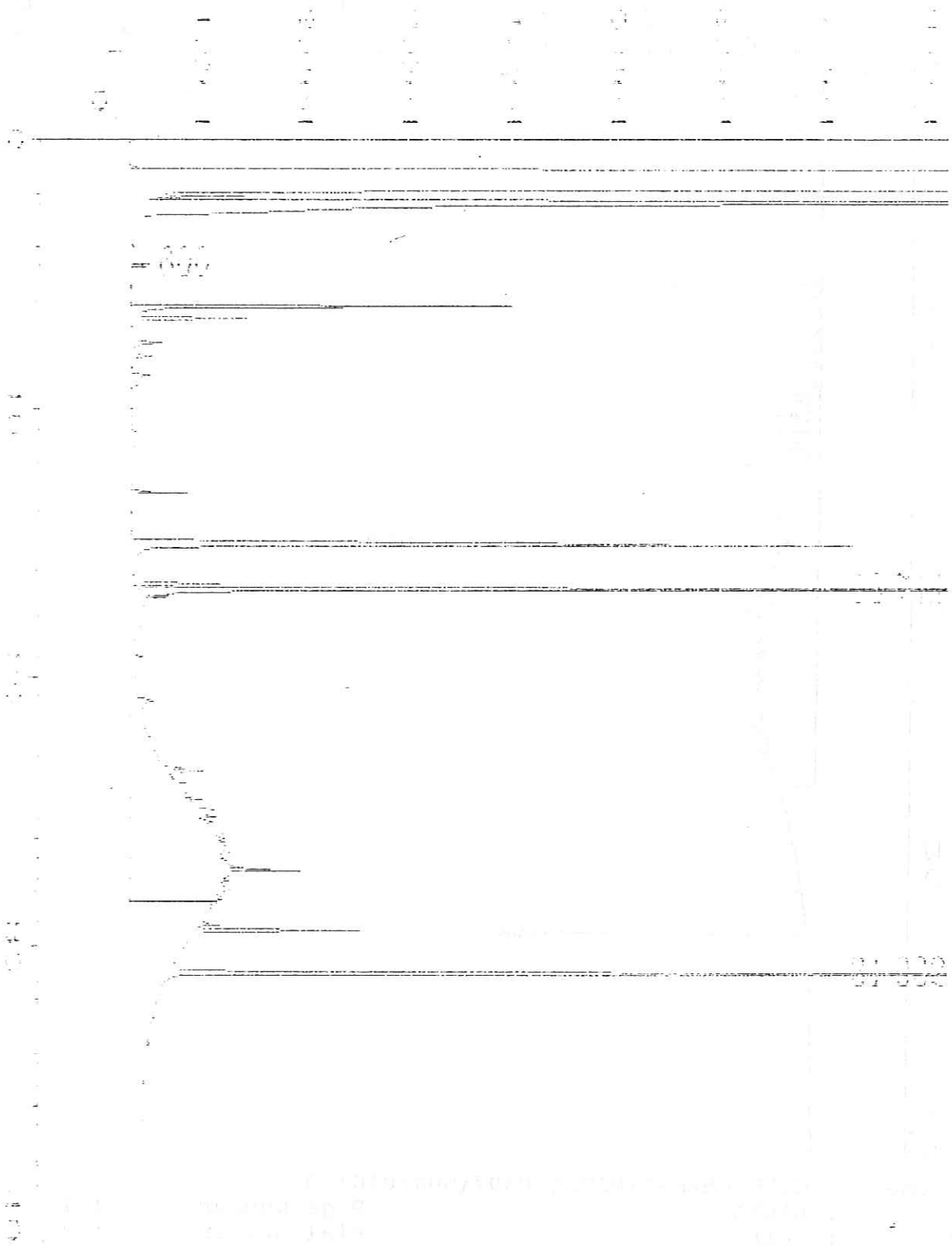
Acquired on	: 07 Jun 92 10:35 PM	Instrument Method	: TPH1F.MTH
Report Created on	: 08 Jun 92 10:01 AM	Analysis Method	: TPH1F.MTH

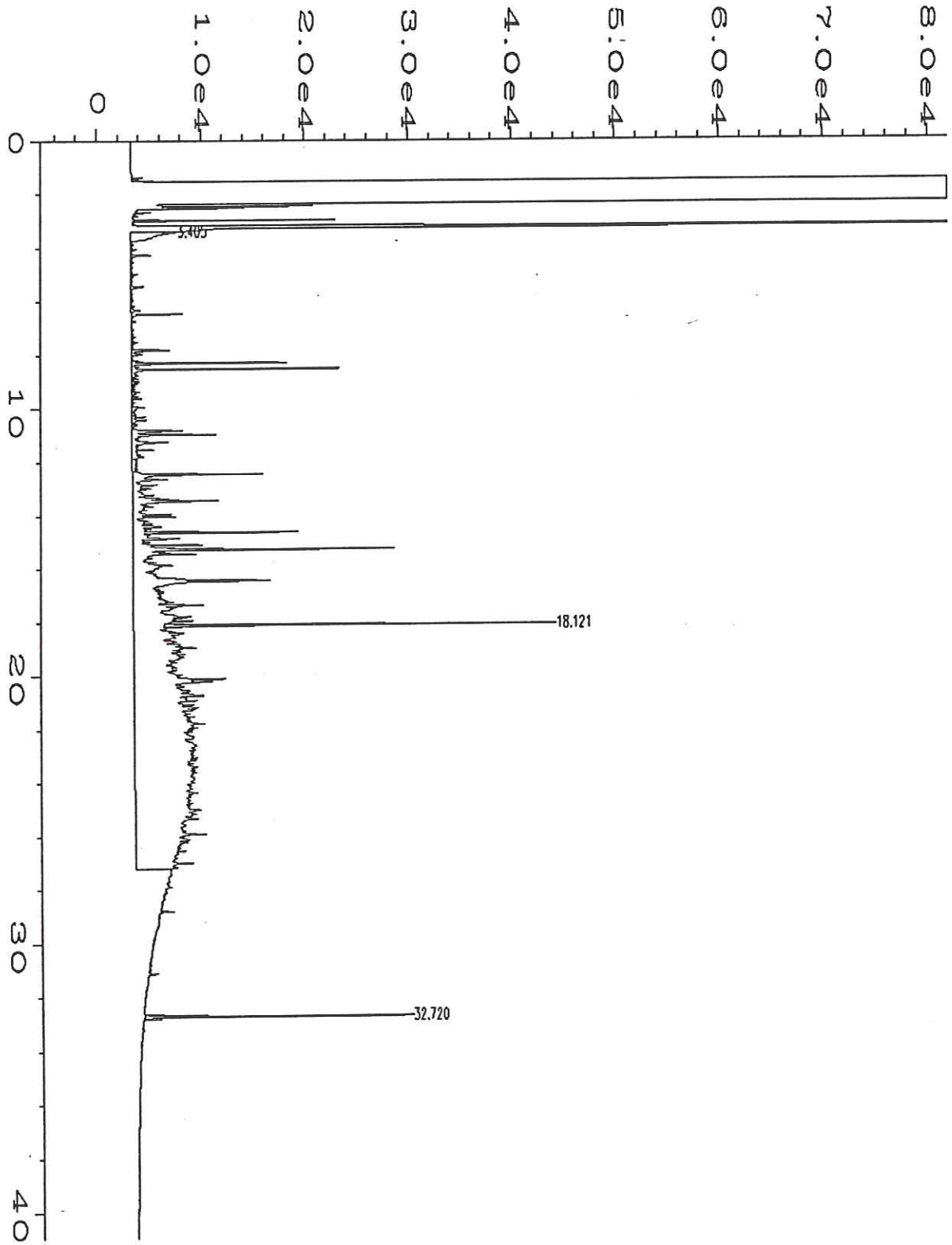


Data File Name : C:\HPCHEM\3\DATA\MAY29\017F1001.D
Operator : DAN
Instrument : BOB
Sample Name : 205-1321
Run Time Bar Code:
Acquired on : 30 May 92 04:12 AM
Report Created on: 05 Jun 92 04:54 PM

Page Number : 1
Vial Number : 17
Injection Number : 1
Sequence Line : 10
Instrument Method: TPH3F.MTH
Analysis Method : DEFAULT.MTH

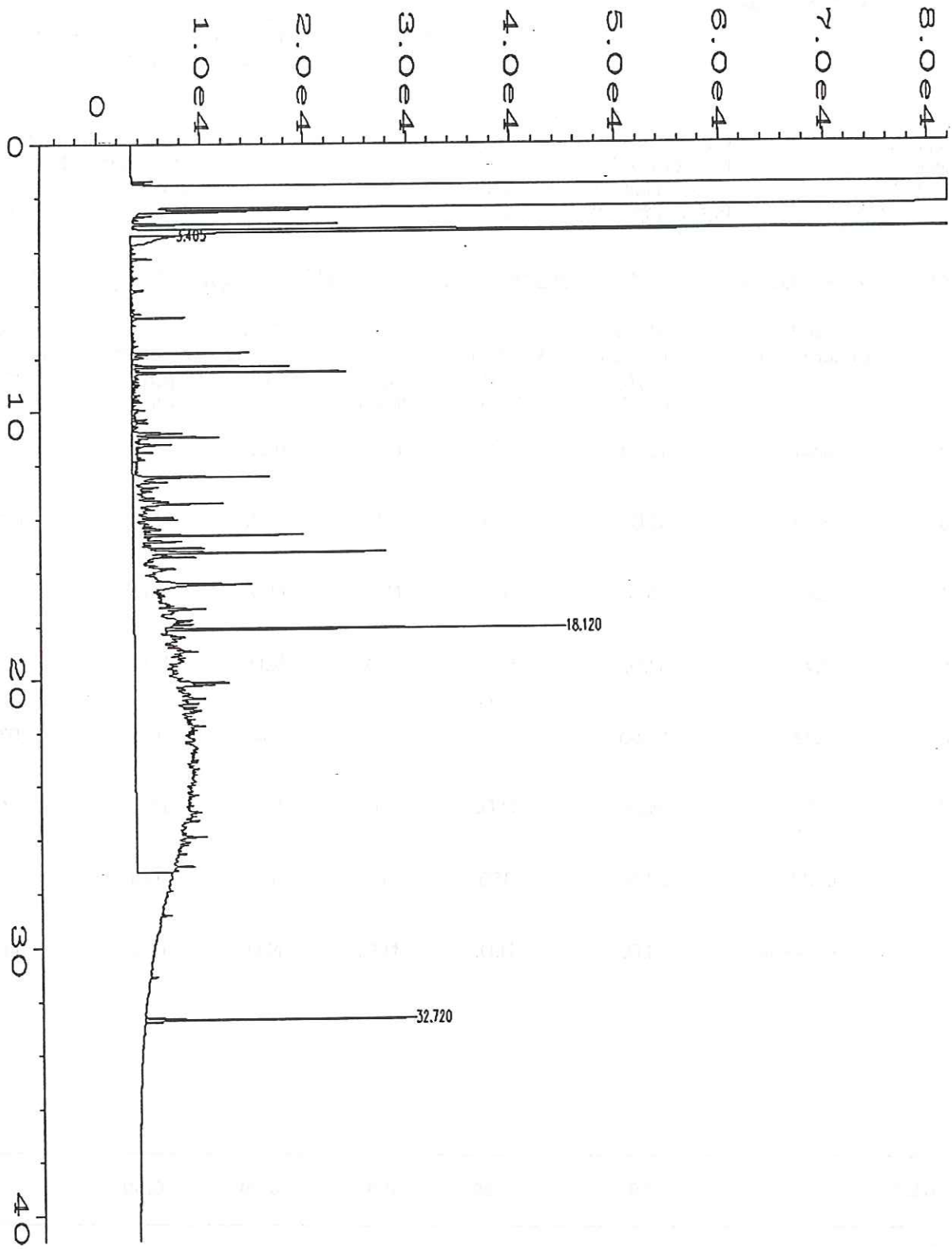


Data File Name	: C:\HPCHEM\3\DATA\MAY29\018F1001.D		
Operator	: DAN	Page Number	: 1
Instrument	: BOB	Vial Number	: 18
Sample Name	: 205-1322	Injection Number	: 1
Run Time Bar Code:		Sequence Line	: 10
Acquired on	: 30 May 92 05:04 AM	Instrument Method	: TPH3F.MTH
Report Created on	: 05 Jun 92 04:57 PM	Analysis Method	: DEFAULT.MTH



Data File Name : C:\HPCHEM\1\DATA\JUN07\008F0401.D
Operator : LAURA
Instrument : PHIL
Sample Name : 205-1323 11X
Run Time Bar Code:
Acquired on : 08 Jun 92 00:22 AM
Report Created on: 08 Jun 92 09:21 AM

Page Number : 1
Vial Number : 8
Injection Number : 1
Sequence Line : 4
Instrument Method: TPH1F.MTH
Analysis Method : TPH1F.MTH



Data File Name : C:\HPCHEM\1\DATA\JUN07\010F0401.D
Operator : LAURA
Instrument : PHIL
Sample Name : 205-1326 11X
Run Time Bar Code:
Acquired on : 08 Jun 92 02:09 AM
Report Created on: 08 Jun 92 09:24 AM

Page Number : 1
Vial Number : 10
Injection Number : 1
Sequence Line : 4
Instrument Method: TPH1F.MTH
Analysis Method : TPH1F.MTH

NORTH CREEK ANALYTICAL

18939 120th Avenue N.E., Suite 101 • Bothell, WA 98011-2569
Phone (206) 481-9200 • FAX (206) 485-2992

GeoEngineers, Inc.	Client Project ID:	Unocal/Chelan, #161-228-R04	Sampled:	May 21, 1992
8410 154th Avenue N.E.	Matrix Descript:	Water	Received:	May 26, 1992
Redmond, WA 98052	Analysis Method:	EPA 5030/8015/8020	Analyzed:	May 29, 1992
Attention: Norman Puri	First Sample #:	205-1319	Reported:	Jun 10, 1992

TOTAL PETROLEUM HYDROCARBONS with BTEX DISTINCTION (WTPH-G/BTEX)

Sample Number	Sample Description	Volatile Hydrocarbons µg/L (ppb)	Benzene µg/L (ppb)	Toluene µg/L (ppb)	Ethyl Benzene µg/L (ppb)	Xylenes µg/L (ppb)	Surrogate Recovery %
205-1319	MW-1	1,200 G-2	1.2	N.D.	0.57	4.3	134
205-1320	MW-2	N.D.	N.D.	N.D.	N.D.	N.D.	112
205-1321	MW-3	100 G-2	1.0	N.D.	N.D.	N.D.	115
205-1322	MW-4	N.D.	N.D.	N.D.	N.D.	N.D.	109
205-1323	MW-5	2,500	160	11	170	190	93
205-1324	MW-6	N.D.	N.D.	N.D.	N.D.	N.D.	125
205-1326	DUP 1	2,300	160	14	160	170	128
BLK052992	Method Blank	N.D.	N.D.	N.D.	N.D.	N.D.	113
Detection Limits:		**50**	**0.50**	**0.50**	**0.50**	**0.50**	

Volatile Hydrocarbons are quantitated as gasoline range organics (nC5 - nC12). Surrogate recovery reported is for Bromofluorobenzene.
Analytes reported as N.D. were not present above the stated limit of detection.

NORTH CREEK ANALYTICAL inc

Scot Cocanour
Laboratory Director

2051319.GEO <3>

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HYDROCARBON ANALYSES FOOTNOTES

(1/92)

Code	Description

VOLATILE HYDROCARBONS - Gasoline Range Organics

G 1 The hydrocarbons present in this sample are primarily due to extractable diesel range organics.

G 2 The hydrocarbons present in this sample are a complex mixture of both gasoline range and diesel range organics.

G 3 The total hydrocarbon result in this sample is primarily due to a peak(s) eluting in the purgeable hydrocarbon range. Identification and quantitation by EPA 8010, 8021 or 8240 is recommended.

EXTRACTABLE HYDROCARBONS - Diesel Range Organics

D 1 The hydrocarbons present in this sample are primarily due to volatile gasoline range organics.

D 2 The hydrocarbons present in this sample are primarily due to very heavy, non-resolvable oil range organics. Quantitation by EPA 418.1 is recommended.

D 3 The hydrocarbons present in this sample are a complex mixture of volatile gasoline, extractable diesel and non-resolvable oil range organics.

D 4 The hydrocarbon result shown is an estimated (greater than) value due to high concentration. Reanalysis is being performed to yield a quantitative result.

Oils & Lubricants
[----------]
T.R.P.H. (418.1)

Diesel & Fuel Oils
[----------]
Extractables (3550/8015)

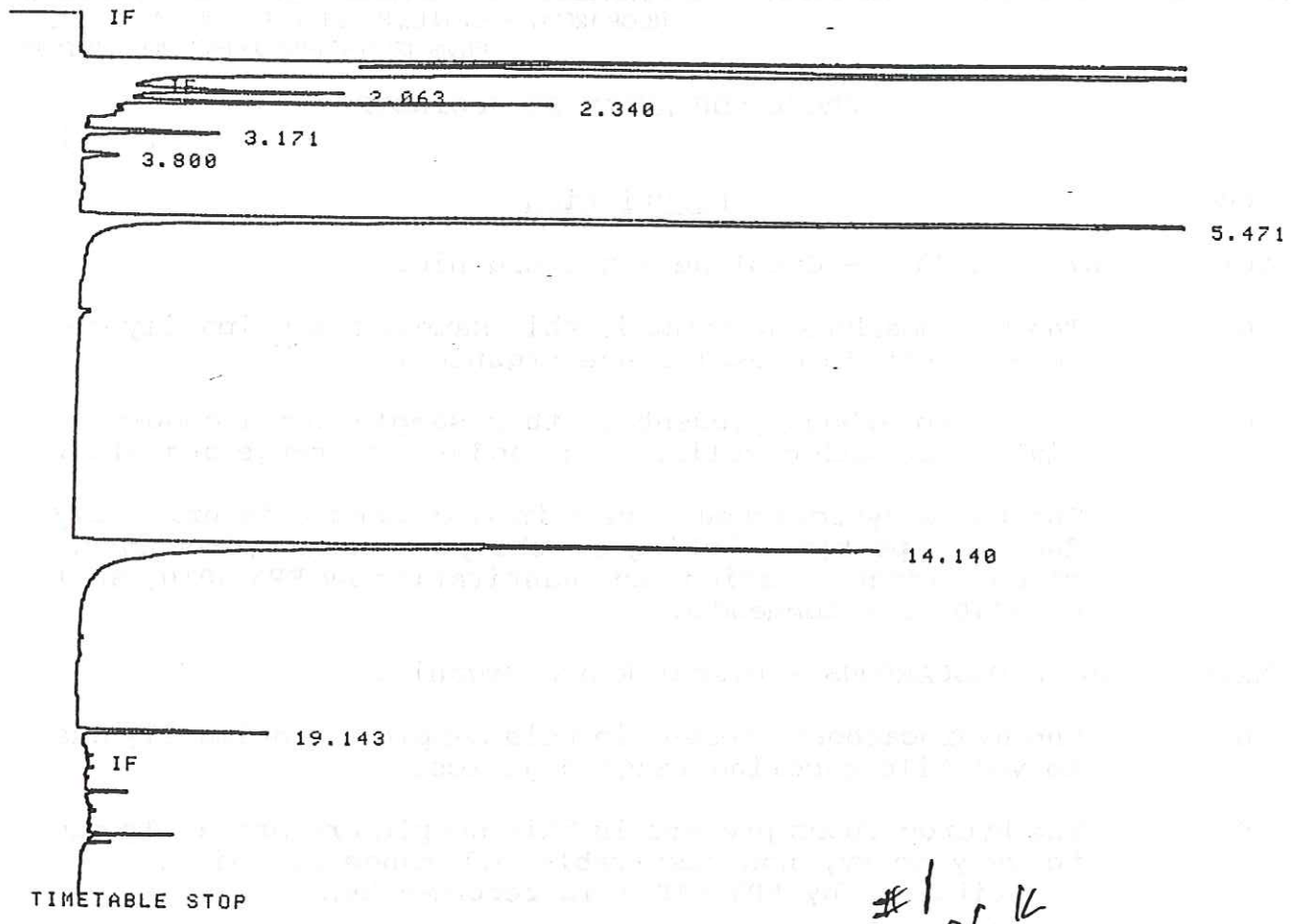
Gasoline
[----------]
Volatiles (5030/8015)

LOW LOW TO MEDIUM MEDIUM MEDIUM TO HIGH VERY HIGH
HYDROCARBON BOILING POINT RANGE

CARBON RANGE:
5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 +29

* RUN # 6198 MAY 29, 1992 08:00:57

START



#1 DI Blank Sml

RUN# 6198 MAY 29, 1992 08:00:57

GC#6

ISTD-HEIGHT

RT	TYPE	AREA	WIDTH	HEIGHT	CAL#	MASS NG	NAME
2.063	BB	59970	.082	12133		8.529	
2.340	PB	89417	.060	24754		17.401	
3.171	BB	46736	.098	7955		5.592	
3.800	BB	14034	.104	2242		1.576	
5.471	PB	692297	.101	113805	2&		1,2,3-TFB
14.140	PB	377751	.138	45458	7R	67.106	4-BFB
19.143	PB	45770	.070	10965		7.708	

TOTAL HEIGHT= 217312
MUL FACTOR=1.0000E+00
ISTD AMT=8.0000E+01

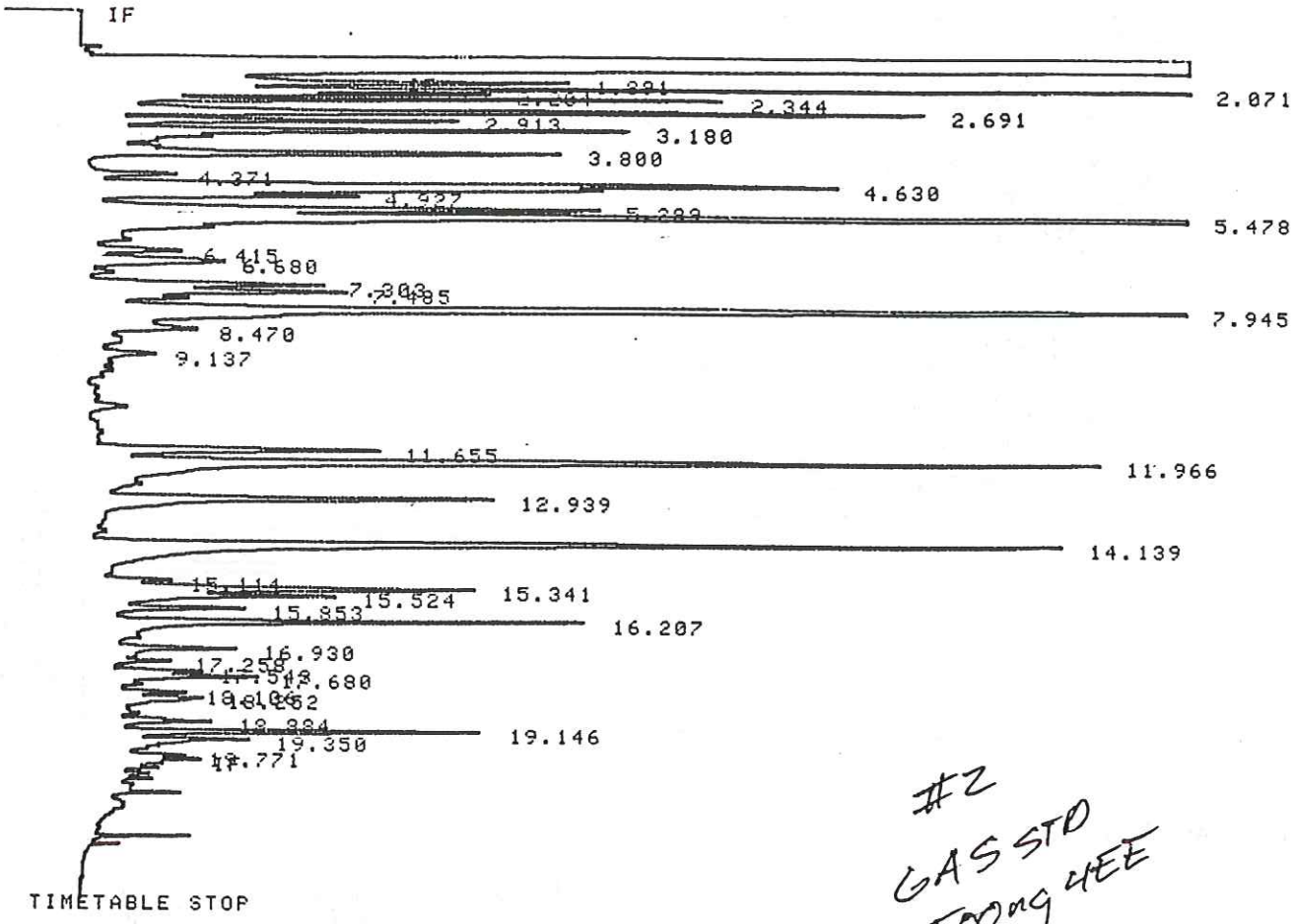
* RUN # 6199 MAY 29, 1992 08:31:23

START

IF

* RUN # 6199 MAY 29, 1992 08:31:23

START



#2
GAS STD
500ng 4EE

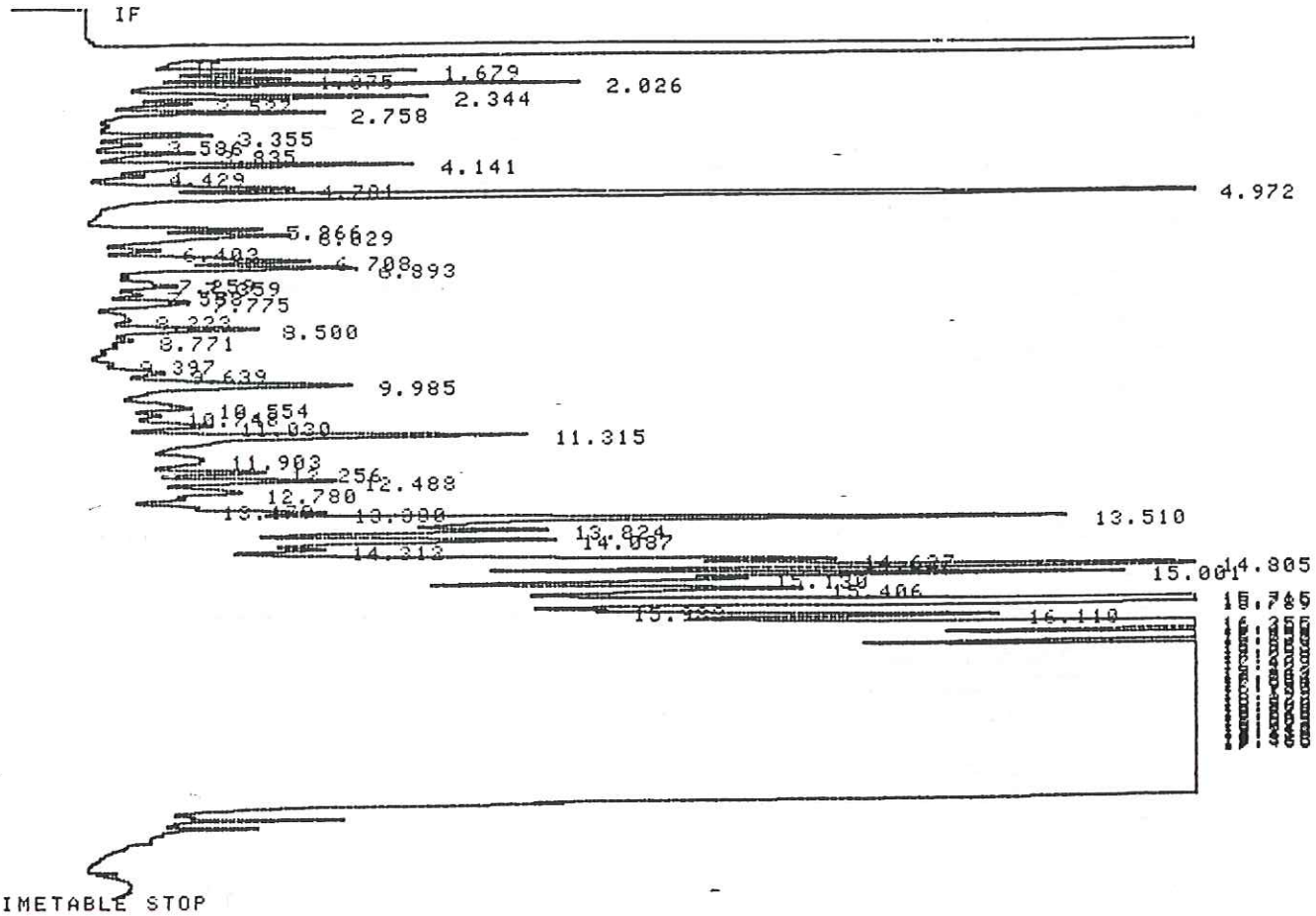
RUN# 6199 MAY 29, 1992 08:31:23

GC#6

ISTD-HEIGHT

RT	TYPE	AREA	WIDTH	HEIGHT	CAL#	MASS NG	NAME
1.891	BP	31681	.059	9025		6.150	
2.071	PV	251297	.056	75347		51.342	
2.204	VP	60474	.059	16946		11.547	
2.344	PP	115842	.060	32313		22.018	
2.691	PP	289256	.105	45904		31.279	
2.913	PV	116340	.099	19584		13.345	
3.180	VV	173450	.097	29949		20.407	
3.800	VP	194031	.120	26877		18.314	
4.371	PV	35065	.119	4930		3.359	
4.630	VV	312459	.122	42707	1	15.156	BENZENE
4.927	VP	95913	.106	15045		10.252	
5.289	PV	225985	.132	28523		19.436	
5.478	VV	802389	.114	117404	2&		1,2,3-TFB
6.415	PV	36753	.123	4961		3.380	
6.680	VV	84043	.190	7364		5.018	
7.303	PV	96809	.124	12991		8.852	
7.485	VV	104602	.126	13804		9.406	
7.945	PB	621574	.102	101186	3	39.852	TOLUENE
8.470	BP	32230	.134	4020		2.739	
9.137	PV	27958	.144	3246		2.212	
11.655	PV	112662	.121	15549	4	7.461	ETH BENZENE
11.966	VB	418419	.126	55383	5	26.642	M/P XYLENE

START



TIMETABLE STOP

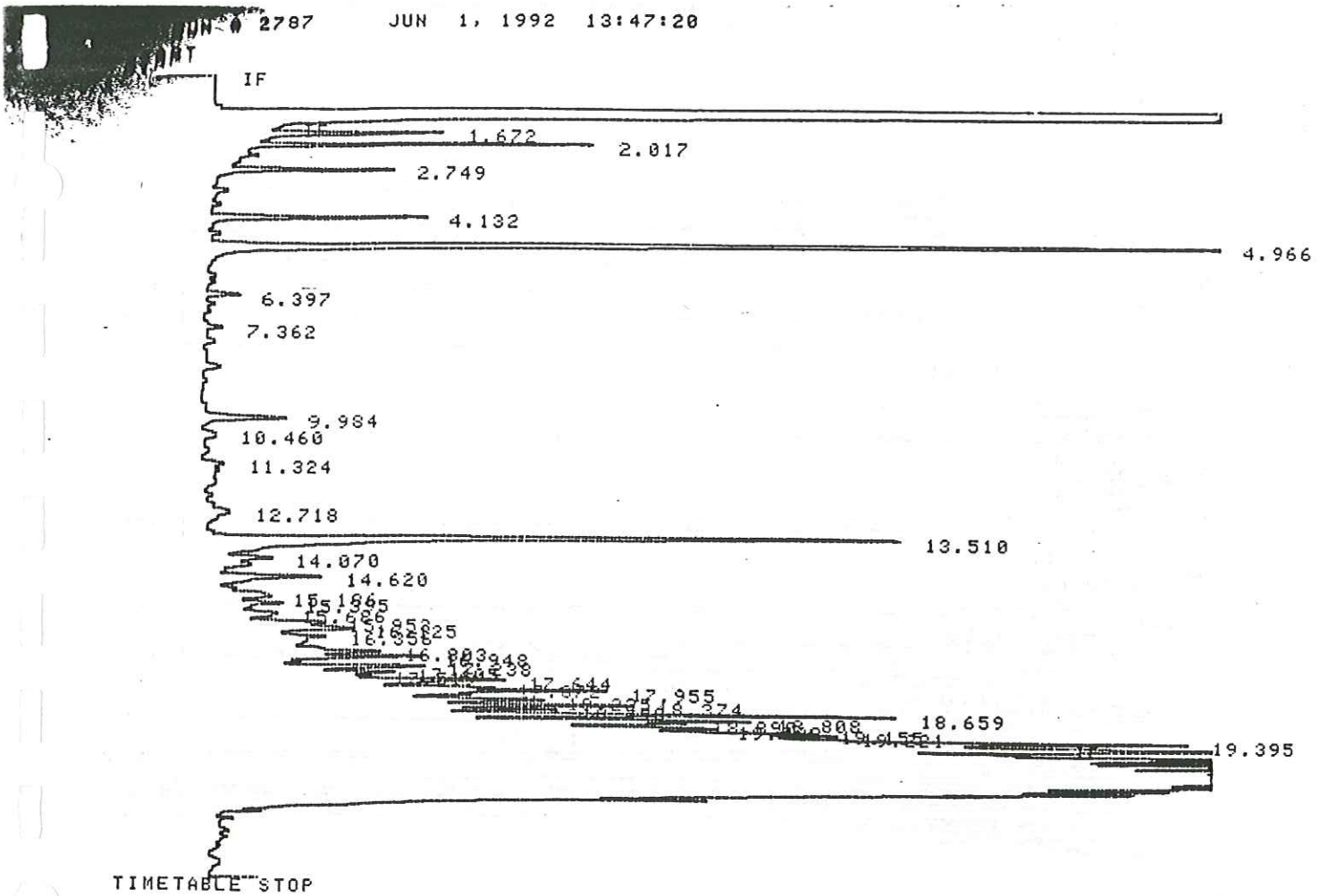
RUN# 2786 JUN 1, 1992 13:17:08 #9 20513P

GC#2 FID

Sml

ISTD-HEIGHT

RT	TYPE	AREA	WIDTH	HEIGHT	CAL#	MASS (NG)	NAME
1.679	BV	9232	.080	1932		10.812	
1.875	VV	5894	.091	1085		6.072	
2.026	VB	11964	.062	3208		17.953	
2.344	BV	13666	.103	2207		12.351	
2.527	VV	3181	.098	542		3.033	
2.758	VB	8006	.084	1580		8.842	
3.355	VV	5205	.104	832		4.656	
3.586	VP	2009	.100	335		1.875	
3.835	PV	4353	.100	726		4.063	
4.141	VV	17533	.125	2336	1	6.288	BENZENE
4.429	VP	2523	.105	400		2.239	
4.781	PV	11622	.138	1399		7.829	
4.972	VB	80233	.094	14295	2&		1,2,3-TFB
5.866	BH	8622	.113	1271		7.113	
6.029	HH	16465	.184	1489		8.333	
6.403	HH	4080	.125	543		3.039	
6.708	HH	17289	.176	1633		9.139	
6.893	HH	15392	.132	1941		10.863	
7.259	HH	3043	.105	483		2.703	
7.359	HH	5150	.128	669	3	2.752	TOLUENE
7.558	HH	3414	.140	406		2.272	
7.775	HH	8768	.197	740		4.141	
8.223	HH	5454	.287	317		1.774	
8.500	HH	12288	.164	1250		6.995	



RUN# 2787 JUN 1, 1992 13:47:20

GC#2 FID

#10 2051321

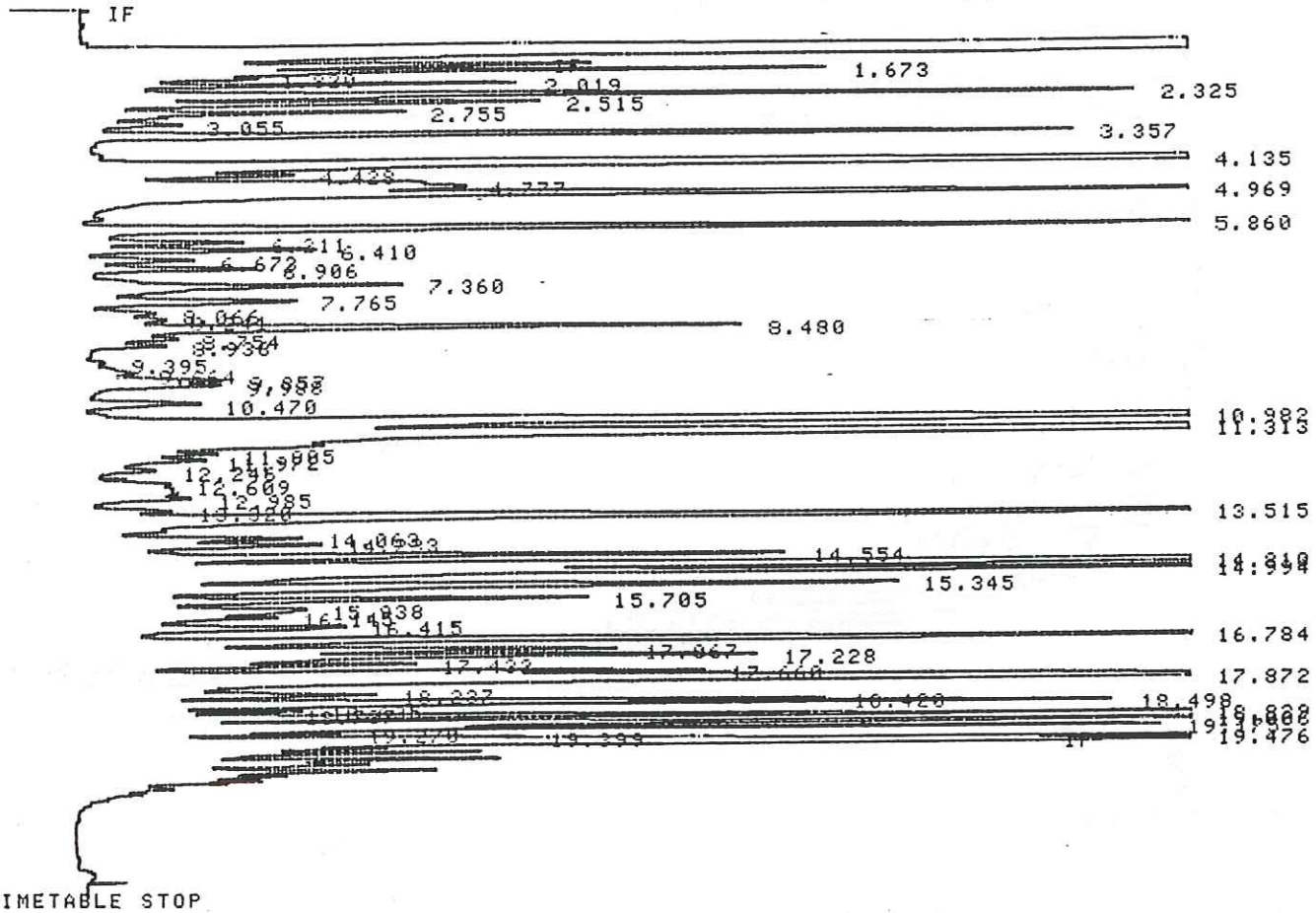
SmL

ISTD-HEIGHT

RT	TYPE	AREA	WIDTH	HEIGHT	CAL#	MASS (NG)	NAME
1.672	BV	7141	.084	1412		7.892	
2.017	VB	10036	.061	2751		15.375	
2.749	PB	6612	.082	1338		7.478	
4.132	PV	9364	.090	1734	1	4.661	BENZENE
4.966	BB	78523	.091	14314	2&		1,2,3-TFB
6.397	VV	1869	.113	275		1.537	
7.362	PV	1490	.153	162	3	.665	TOLUENE
9.984	VP	6201	.154	672		3.756	
10.460	PB	271	.105	43		.240	
11.324	PV	1226	.123	166	5	.852	M/P XYLENE
12.718	BP	2257	.237	159		.889	
13.510	PV	50604	.154	5463	7R	115.718	4-BFB
14.070	VV	3930	.138	475		2.655	
14.620	VV	7783	.149	868		4.851	
15.186	VV	5816	.207	469		2.621	
15.395	VV	4382	.131	558		3.119	
15.686	VV	6628	.210	526		2.940	
15.953	VV	7144	.132	902		5.041	
16.125	VV	11583	.171	1127		6.299	
16.356	VV	8400	.154	907		5.069	
16.803	VV	15293	.189	1347		7.528	
16.948	VV	11549	.115	1681		9.395	
17.238	VV	13151	.129	1701		9.507	

* RUN # 2788 JUN 1, 1992 14:17:29

START



TIMETABLE STOP

RUN# 2788 JUN 1, 1992 14:17:29 #11 205/323

GC#2 FID

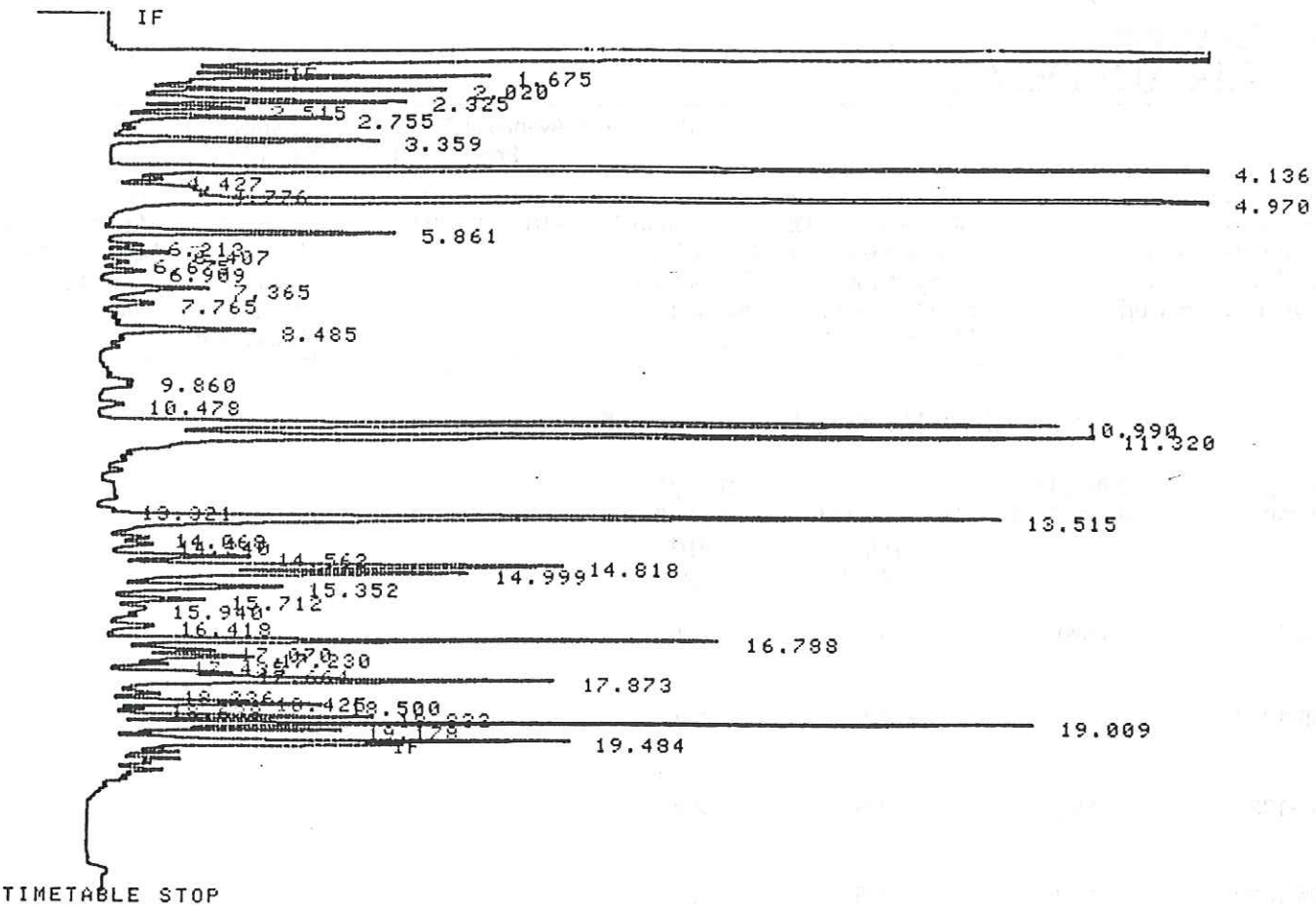
ISTD-HEIGHT

RT	TYPE	AREA	WIDTH	HEIGHT	CAL#	MASS (NG)	NAME
1.673	BV	16004	.064	4145		24.912	
1.820	VP	2044	.080	424		2.548	
2.019	PP	9388	.059	2652		15.939	
2.325	PV	43257	.100	7219		43.387	
2.515	VV	17441	.097	2983		17.928	
2.755	VV	9680	.078	2076		12.477	
3.055	VP	3450	.105	550		3.306	
3.357	PV	41701	.099	7051		42.377	
4.135	PB	310921	.088	58726	1	169.768	BENZENE
4.428	BP	4056	.086	786		4.724	
4.777	PV	36664	.256	2385		14.334	
4.969	VB	77043	.096	13311	2&		1,2,3-TFB
5.860	PB	54696	.114	7983		47.978	
6.211	BV	6000	.097	1030		6.190	
6.410	VP	10299	.107	1609		9.670	
6.673	PV	5618	.120	783		4.706	
6.906	VV	8332	.114	1221		7.338	
7.360	VV	22390	.163	2286	3	10.098	TOLUENE
7.765	VV	13612	.150	1511		9.081	
8.066	VV	4038	.132	509		3.059	
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		[illegible]	

Int

* RUN # 2793 JUN 1, 1992 16:49:02

START



TIMETABLE STOP

RUN# 2793 JUN 1, 1992 16:49:02 #16 205326

GC#2 FID

25 µl

ISTD-HEIGHT

RT	TYPE	AREA	WIDTH	HEIGHT	CAL#	MASS (NG)	NAME
1.675	BV	8918	.067	2209		12.639	
2.020	PP	7730	.060	2141		12.250	
2.325	PV	11481	.099	1942		11.111	
2.515	VP	4617	.094	817		4.675	
2.755	PB	6562	.075	1454		8.319	
3.359	PB	11567	.100	1935		11.071	
4.136	PB	78555	.089	14779	1	40.673	BENZENE
4.427	BP	1111	.084	221		1.264	
4.776	PV	8081	.237	568		3.250	
4.970	VB	77376	.092	13982	2&		1,2,3-TFB
5.861	PV	14840	.117	2120		12.130	
6.213	VV	1858	.106	292		1.671	
6.407	VP	3329	.112	496		2.838	
6.675	PV	1422	.117	202		1.156	
6.909	VB	2023	.108	313		1.791	
7.365	BV	7584	.161	786	3	3.305	TOLUENE
7.765	VV	3412	.146	389		2.226	
8.485	VV	9641	.144	1113		6.368	
9.860	VV	1740	.120	241		1.379	
10.478	VP	1562	.137	190		1.087	
10.990	PV	48082	.117	6842	4	37.268	ETHYL BENZENE
11.320	VB	51689	.124	6956	5	36.536	M/P XYLENE
13.321	PV	626	.087	120		.687	

NORTH CREEK ANALYTICAL

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Phone (206) 481-9200 • FAX (206) 485-2992

GeoEngineers, Inc.	Client Project ID:	Unocal/Chelan, #161-228-R04	Sampled:	May 21, 1992
8410 154th Avenue N.E.	Analysis Method:	EPA 7421	Received:	May 26, 1992
Redmond, WA 98052	Analysis for:	Dissolved Lead	Digested:	Jun 3, 1992
Attention: Norman Puri	First Sample #:	205-1319	Analyzed:	Jun 8, 1992
	Matrix:	Water	Reported:	Jun 10, 1992

METALS ANALYSIS FOR: Dissolved Lead

Sample Number	Sample Description	Detection Limit µg/L (ppb)	Sample Result µg/L (ppb)
205-1319	MW-1	1.5	19
205-1320	MW-2	1.5	3.3
205-1321	MW-3	1.5	2.9
205-1322	MW-4	1.5	41
205-1323	MW-5	1.5	5.3
205-1324	MW-6	1.5	4.7
BLK060392	Method Blank	1.5	N.D.

Analytes reported as N.D. were not present above the stated limit of detection.

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Scot Cocanour
Laboratory Director

2051319.GEO <4>

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GeoEngineers, Inc.	Client Project ID: Unocal/Chelan, #161-228-R04	Analyst :	S. Kimball
8410 154th Avenue N.E.	Method : EPA 418.1 mod.		
Redmond, WA 98052	Sample Matrix : Water	Extracted:	May 28, 1992
Attention: Norman Puri	Units : mg/L	Analyzed:	May 29, 1992
	QC Sample #: BLK052892	Reported:	Jun 10, 1992

QUALITY CONTROL DATA REPORT

ANALYTE	Petroleum Oil
Sample Conc.:	N.D.
Spike Conc. Added:	15
Conc. Matrix Spike:	16.2
Matrix Spike % Recovery:	108
Conc. Matrix Spike Dup.:	16.3
Matrix Spike Duplicate % Recovery:	111
Relative % Difference:	2.4

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Scot Cocanour
Laboratory Director

% Recovery:	Conc. of M.S. - Conc. of Sample / Spike Conc. Added	x 100
Relative % Difference:	Conc. of M.S. - Conc. of M.S.D. / (Conc. of M.S. + Conc. of M.S.D.) / 2	x 100

2051319.GEO <5>

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Phone (206) 481-9200 • FAX (206) 485-2992

GeoEngineers, Inc.	Client Project ID: Unocal/Chelan, #161-228-R04	Analyst :	M. Essig
8410 154th Avenue N.E.	Method : EPA 5030/8020		K. Wilke
Redmond, WA 98052	Sample Matrix : Water		
Attention: Norman Puri	Units : µg/L	Analyzed:	May 29, 1992
	QC Sample #: 205-1227	Reported:	Jun 10, 1992

QUALITY CONTROL DATA REPORT

ANALYTE	Benzene	Toluene	Ethyl benzene	Xylenes
Sample Conc.:	N.D.	N.D.	N.D.	N.D.
Spike Conc. Added:	5.0	5.0	5.0	15.0
Conc. Matrix Spike:	4.4	5.4	5.8	17.0
Matrix Spike % Recovery:	88	108	116	113
Conc. Matrix Spike Dup.:	4.4	5.0	5.8	16.8
Matrix Spike Duplicate % Recovery:	88	100	116	112
Relative % Difference:	0	7.7	0	1.2

NORTH CREEK ANALYTICAL inc

Scot Cocanour
Laboratory Director

% Recovery:	Conc. of M.S. - Conc. of Sample / Spike Conc. Added	x 100
Relative % Difference:	Conc. of M.S. - Conc. of M.S.D. / (Conc. of M.S. + Conc. of M.S.D.) / 2	x 100

2051319.GEO <6>

NORTH CREEK ANALYTICAL

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Phone (206) 481-9200 • FAX (206) 485-2992

GeoEngineers, Inc.	Client Project ID: Unocal/Chelan, #161-228-R04	Analyst : D. Harmon
8410 154th Avenue N.E.	Method : EPA 3510 or 3550/8015	
Redmond, WA 98052	Sample Matrix : Water	Extracted: May 28, 1992
Attention: Norman Puri	Units : mg/L	Analyzed: May 30, 1992
	QC Sample #: BLK052892	Reported: Jun 10, 1992

QUALITY CONTROL DATA REPORT

ANALYTE	Diesel Fuel
Sample Conc.:	N.D.
Spike Conc. Added:	1.98
Conc. Matrix Spike:	2.0
Matrix Spike % Recovery:	101
Conc. Matrix Spike Dup.:	1.88
Matrix Spike Duplicate % Recovery:	95
Relative % Difference:	13

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Scot Cocanour
Laboratory Director

% Recovery:	Conc. of M.S. - Conc. of Sample / Spike Conc. Added	x 100
Relative % Difference:	Conc. of M.S. - Conc. of M.S.D. / (Conc. of M.S. + Conc. of M.S.D.) / 2	x 100

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Phone (206) 481-9200 • FAX (206) 485-2992

GeoEngineers, Inc.	Client Project ID: Unocal/Chelan, #161-228-R04	Analyst :	F. Shino
8410 154th Avenue N.E.	Method : EPA 7421		
Redmond, WA 98052	Sample Matrix : Water	Digested:	Jun 3, 1992
Attention: Norman Puri	Units : µg/L	Analyzed:	Jun 8, 1992
	QC Sample #: BLK060392	Reported:	Jun 10, 1992

QUALITY CONTROL DATA REPORT

ANALYTE	Pb
Sample Conc.:	N.D.
Spike Conc. Added:	30
Conc. Matrix Spike:	24
Matrix Spike % Recovery:	80
Conc. Matrix Spike Dup.:	27
Matrix Spike Duplicate % Recovery:	90
Relative % Difference:	11.7

NORTH CREEK ANALYTICAL inc

Scot Cocanour
Laboratory Director

% Recovery:	Conc. of M.S. - Conc. of Sample / Spike Conc. Added	x 100
Relative % Difference:	Conc. of M.S. - Conc. of M.S.D. / (Conc. of M.S. + Conc. of M.S.D.) / 2	x 100

CREEK ANALYTICAL

18939 120th Avenue N.E., Suite 101 • Bothell, WA 98011-2569
Phone (206) 481-9200 • FAX (206) 485-2992

CHAIN OF CUSTODY REPORT

CLIENT: GEI
ADDRESS: 8410 154th Ave NE
Redmond Wa 98052
PHONE: 861-6000 FAX: 861-6050
PROJECT NAME: Unocal/Chelan
PROJECT NUMBER: 161228R04
SAMPLED BY: MET

REPORT TO: Norm Puri
BILLING TO: GEI
P.O. NUMBER:
NCA QUOTE #:

SAME DAY (2-8 HR.) RUSH	(+150%)
NEXT DAY RUSH	(+100%)
2 DAY RUSH	(+80%)
3 DAY RUSH	(+60%)
5 DAY RUSH	(+40%)
10 DAY STANDARD	(LIST PRICE) ✓

	SAMPLE IDENTIFICATION: NUMBER OR DESCRIPTION	SAMPLING DATE / TIME	MATRIX (W,S,O)	# OF CONT.	BETX	WTPH-G	WTPH-D	ANALYSIS REQUESTED 418.1	D133. lead	COMMENTS & PRESERVATIVES USED	LABORATORY NUMBER
1	MW-1	5/21/92 1710	W	3	X	X	X	X	X	all Pb samples filtered in field.	205319
2	MW-2	1510 ~~1430~~		5	X	X	X	X	X		1320
3	MW-3	1550		5	X	X	X	X	X		1321
4	MW-4	1730 ~~1630~~		5	X	X	X	X	X		1322
5	MW-5	1530 ~~1550~~		5	X	X	X	X	X		1323
6	MW-6	1820		5	X	X	X	X	X		1324
7	Trip Blank			2							1325
8	Dup 1	↓	↓	4	X	X	X	X			1326
9										TOTAL # OF CONTAINERS	
10										RECEIVED?	

RELINQUISHED BY: M Cummings DATE: 5/26/92
FIRM: GEI TIME: 0830
RECEIVED BY: P.D Neely DATE: 05.26.92
FIRM: TIME: 11:05

RELINQUISHED BY: DATE:
FIRM: TIME:
RECEIVED BY: DATE:
FIRM: TIME:

SAMPLE RECEIPT INFORMATION: CONTAINER CONDITION?: GOOD VIOLATED COOL (4° C)? YES NO
CUSTODY SEALS? GOOD VIOLATED NOT USED HAZARDOUS SAMPLES?: NO YES; DESCRIBE ON BACK

PAGE OF

NORTH CREEK ANALYTICAL

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Phone (206) 481-9200 • FAX (206) 485-2992

GeoEngineers, Inc.	Client Project ID:	Unocal, #161-228-R04	Sampled:	Aug 19, 1992
8410 154th Avenue N.E.	Matrix Descript:	Water	Received:	Aug 24, 1992
Redmond, WA 98052	Analysis Method:	WTPH-G,EPA 5030/8020	Analyzed:	Aug 26, 1992
Attention: Norman Puri	First Sample #:	208-1115	Reported:	Sep 10, 1992

TOTAL PETROLEUM HYDROCARBONS with BTEX DISTINCTION (WTPH-G/BTEX)

Sample Number	Sample Description	Volatile Hydrocarbons µg/L (ppb)	Benzene µg/L (ppb)	Toluene µg/L (ppb)	Ethyl Benzene µg/L (ppb)	Xylenes µg/L (ppb)	Surrogate Recovery %
208-1115	MW-1	570 G2	28	5.0	4.7	24	117
208-1116	MW-3	N.D.	4.4	N.D.	N.D.	N.D.	103
208-1117	MW-5	2,200	130	6.1	70	180	130
208-1118	MW-6	N.D.	N.D.	N.D.	N.D.	N.D.	107
BLK082692	Method Blank	N.D.	N.D.	N.D.	N.D.	N.D.	103

GeoEngineers

SEP 15 1992

Routing

File

Detection Limits:	50	0.50	0.50	0.50	1.0

Volatile Hydrocarbons are quantitated as Gasoline Range Organics (nC7 - nC12). Surrogate recovery reported is for Bromofluorobenzene.
Analytes reported as N.D. were not present above the stated limit of detection.

NORTH CREEK ANALYTICAL inc

Scot Cocanour
Laboratory Director

2081115.GEO <1>

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HYDROCARBON ANALYSES FOOTNOTES

(8/92)

Code	Description

VOLATILE HYDROCARBONS - Gasoline Range Organics

G 1 This sample appears to contain extractable diesel range organics.

G 2 The chromatogram for this sample is not a typical gasoline fingerprint.

G 3 The total hydrocarbon result in this sample is primarily due to a peak(s) eluting in the volatile hydrocarbon range. Identification and quantitation by EPA 8010, 8021 or 8240 is recommended.

EXTRACTABLE HYDROCARBONS - Diesel Range Organics

D 1 This sample appears to contain volatile gasoline range organics.

D 2 The hydrocarbons present in this sample are primarily due to very heavy, non-resolvable oil range organics. Quantitation by EPA 418.1 is recommended.

D 3 The hydrocarbons present in this sample are a complex mixture of extractable diesel range and non-resolvable motor oil or other heavy oil range organics.

D 4 The hydrocarbon result shown is an estimated (greater than) value due to high concentration. Reanalysis is being performed to yield a quantitative result.

Oils & Lubricants

[----------]

T.R.P.H. (418.1)

Diesel & Fuel Oils

[----------]

Extractables (3550/8015)

Gasoline

[----------]

Volatiles (5030/8015)

HYDROCARBON BOILING POINT RANGE

LOW **LOW TO MEDIUM** **MEDIUM** **MEDIUM TO HIGH** **VERY HIGH**

CARBON RANGE:

5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 +

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Phone (206) 481-9200 • FAX (206) 485-2992

GeoEngineers, Inc.	Client Project ID:	Unocal, #161-228-R04	Sampled:	Aug 19, 1992
8410 154th Avenue N.E.	Matrix Descript:	Water	Received:	Aug 24, 1992
Redmond, WA 98052	Analysis Method:	EPA 5030/8020	Analyzed:	Aug 26, 1992
Attention: Norman Puri	First Sample #:	208-1119	Reported:	Sep 10, 1992

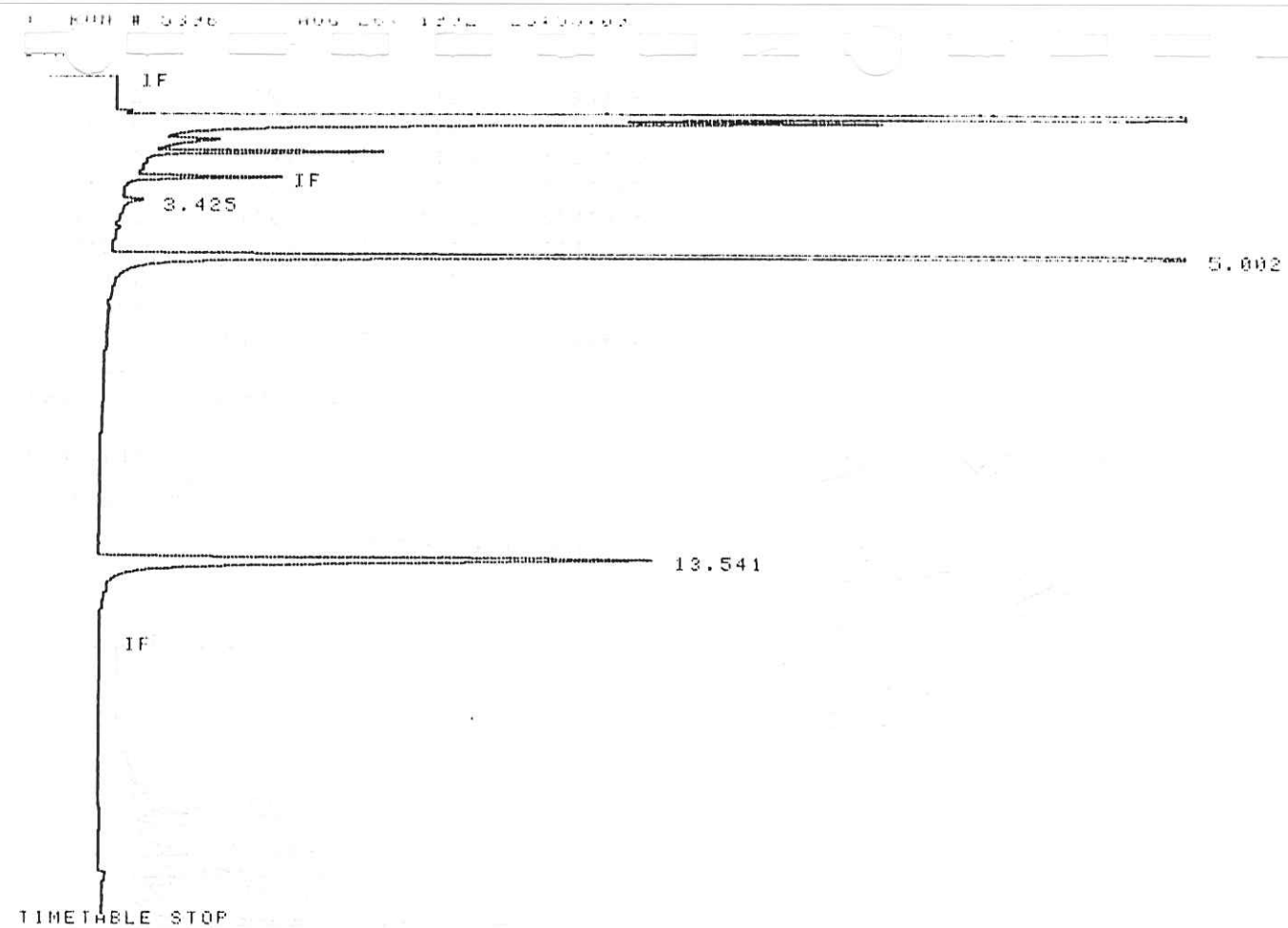
BTEX DISTINCTION

Sample Number	Sample Description	Benzene µg/L (ppb)	Toluene µg/L (ppb)	Ethyl Benzene µg/L (ppb)	Xylenes µg/L (ppb)	Surrogate Recovery %
208-1119	DRUM-1	6.0	1.6	2.2	6.1	113
BLK082692	Method Blank	N.D.	N.D.	N.D.	N.D.	103
Detection Limits:		**0.50**	**0.50**	**0.50**	**1.0**	

Surrogate recovery reported is for Bromofluorbenzene.
Analytes reported as N.D. were not present above the stated limit of detection.

NORTH CREEK ANALYTICAL inc

Scot Cocanour
Laboratory Director



TIMETABLE STOP

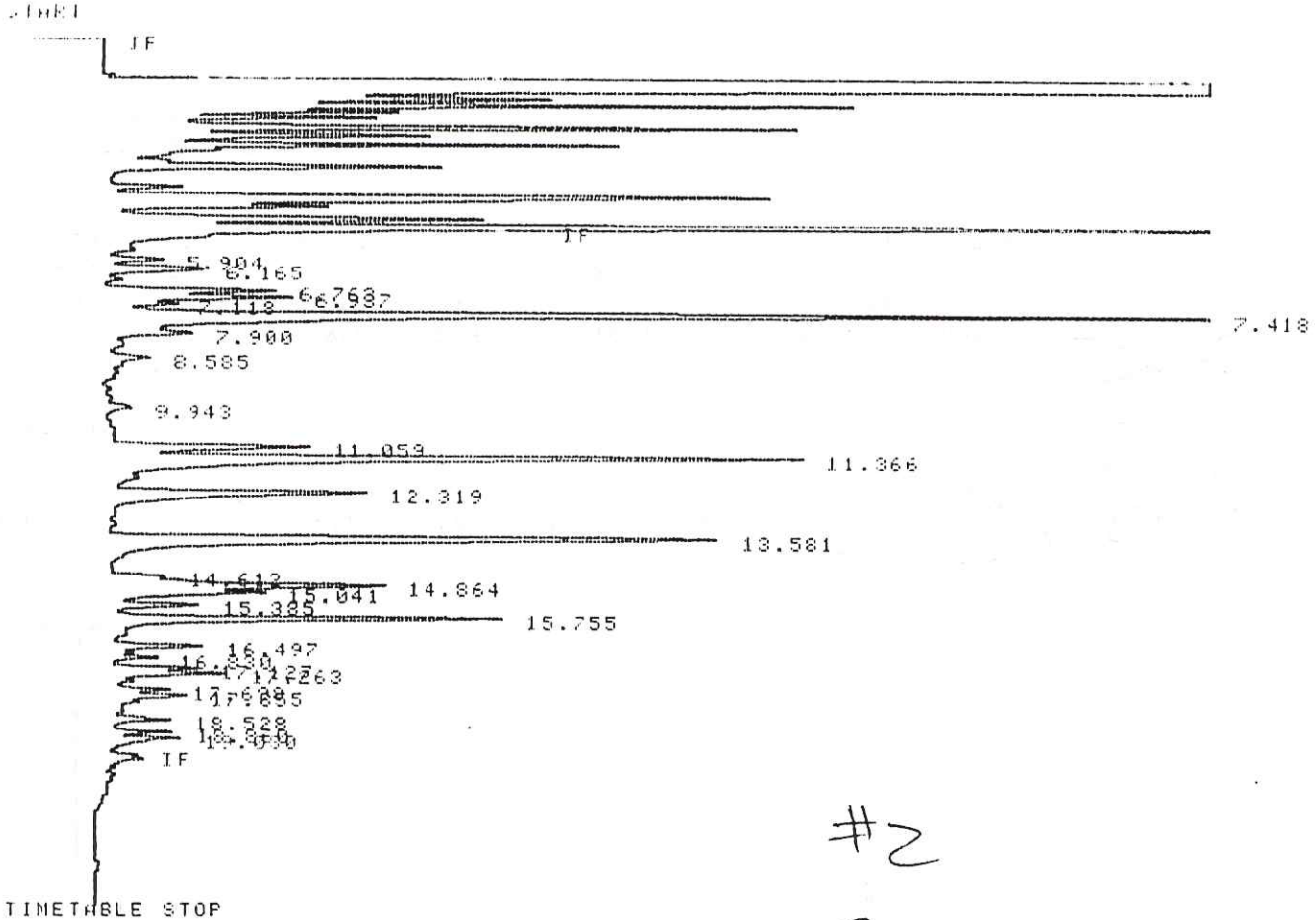
RUN# 5396 AUG 26, 1992 23:55:09 #1 DI BLK Sml

GC#2 FID

ISTD-HEIGHT

RT	TYPE	AREA	WIDTH	HEIGHT	CAL#	MASS (NG)	NAME
3.425	PB	1370	.144	159		.980	
5.002	BB	73129	.094	12981	2&		1,2,3-TFB
13.541	PB	46938	.189	4129	7R	77.205	4-BFB

TOTAL HEIGHT= 17269
MUL FACTOR=1.0000E+00
ISTD AMT=8.0000E+01



TIMETABLE STOP

#2

Gas Std

500 ng 4EE

RUN# 5365 AUG 26, 1992 08:19:17

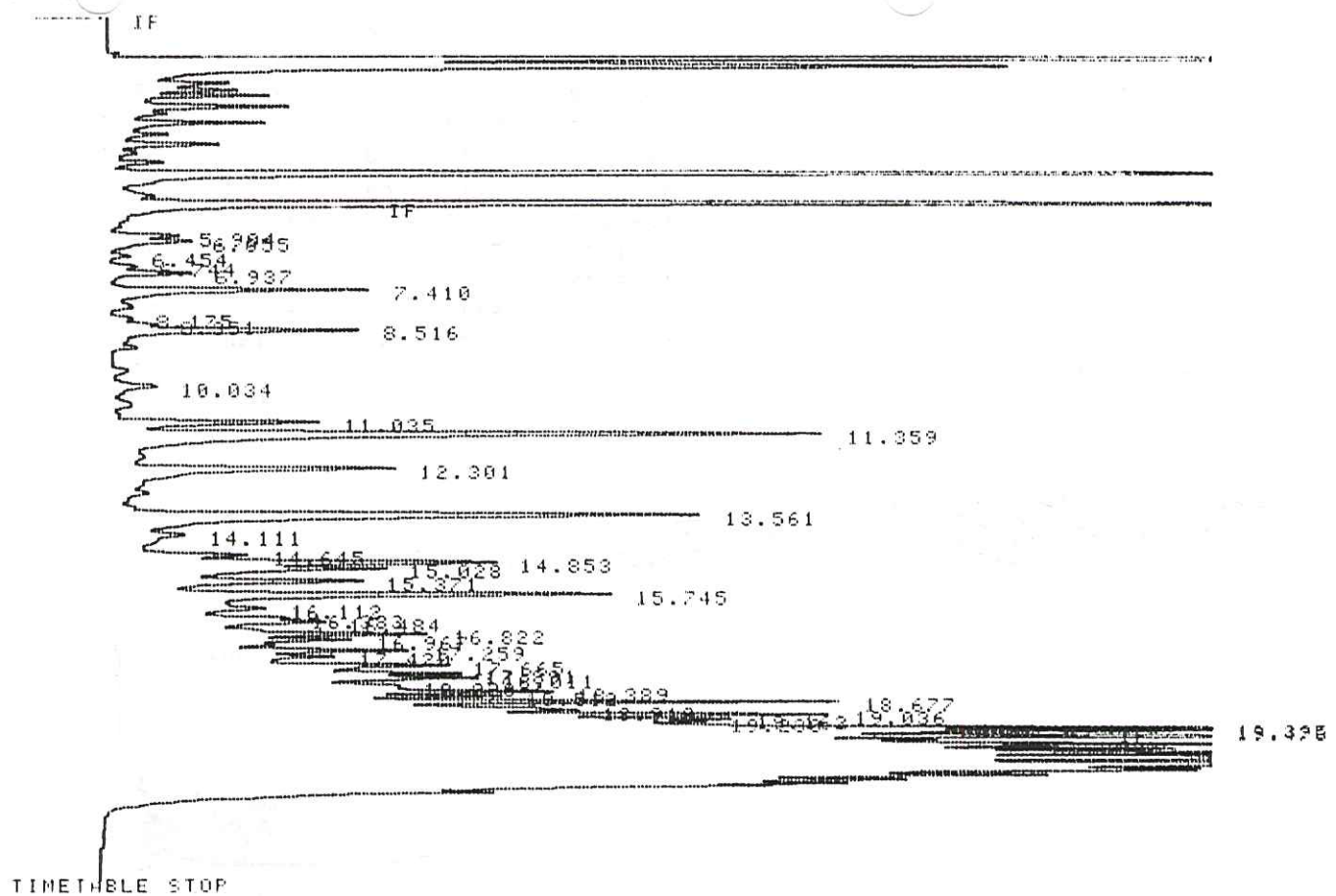
458 ng

GC#2 FID

ISTD PEAK NOT MATCHED

HEIGHT%

RT	HEIGHT	TYPE	WIDTH	HEIGHT%
5.904	396	PV	.116	1.00327
6.165	701	VV	.181	1.77599
6.763	1253	PV	.126	3.17448
6.937	1368	VV	.137	3.46584
7.118	535	VV	.123	1.35543
7.418	9699	VV	.142	24.57247
7.900	640	VV	.184	1.62144
8.585	328	VV	.179	.83099
9.943	199	VV	.170	.50417



TIMETABLE STOP

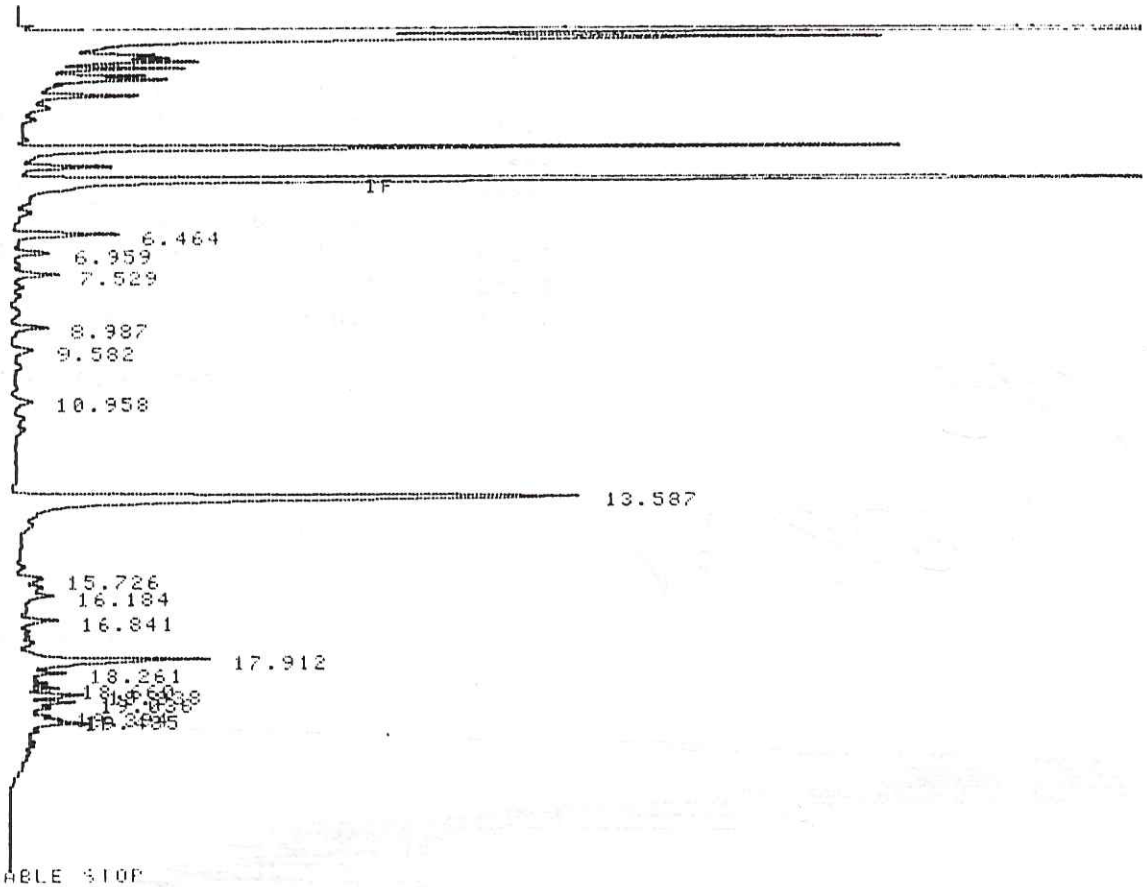
PUU# 5432 AUG 27, 1992 13:30:48

#9 208115

GC#2 FID

ISTD PEAK NOT MATCHED
HEIGHT%

RT	HEIGHT	TYPE	WIDTH	HEIGHT%
5.904	508	PV	.111	.54952
6.055	606	VV	.156	.65553
6.454	155	VP	.115	.16767
6.744	211	PV	.120	.22824
6.937	606	VV	.141	.65553
7.410	1895	VV	.139	2.04987
8.175	157	PV	.121	.16983
8.351	306	VV	.108	.33101



TIMETABLE STOP

RUN# 5409 AUG 27, 1992 06:39:08

#14208116

5ml

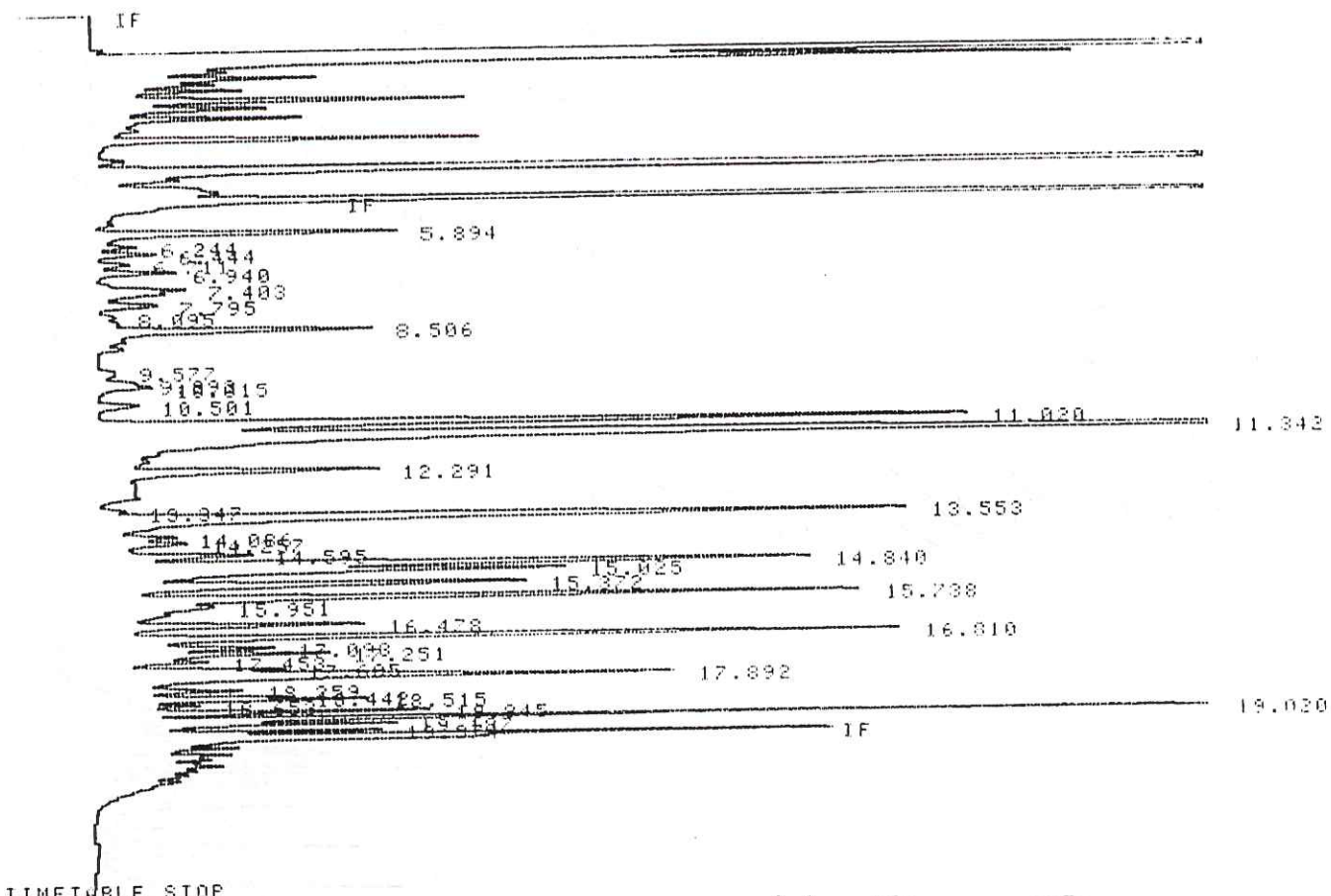
GC#2 FID

ISTD PEAK NOT MATCHED
HEIGHT%

RT	HEIGHT	TYPE	WIDTH	HEIGHT%
6.464	753	PV	.116	7.87081
6.959	255	BP	.115	2.66541
7.529	327	VP	.122	3.41800
8.987	263	BP	.132	2.74903
9.582	151	PV	.164	1.57834
10.958	145	BP	.181	1.51563
13.587	4038	PV	.204	42.20760
15.726	194	PV	.162	2.02780
16.184	257	VV	.177	2.68632
16.841	283	VV	.133	2.95808
[illegible]	[illegible]	PV	.155	[illegible]

RUN # 5423 AUG 27, 1992 14:00:40

START



TIMETABLE STOP

RUN# 5423 AUG 27, 1992 14:00:40

#10 208117

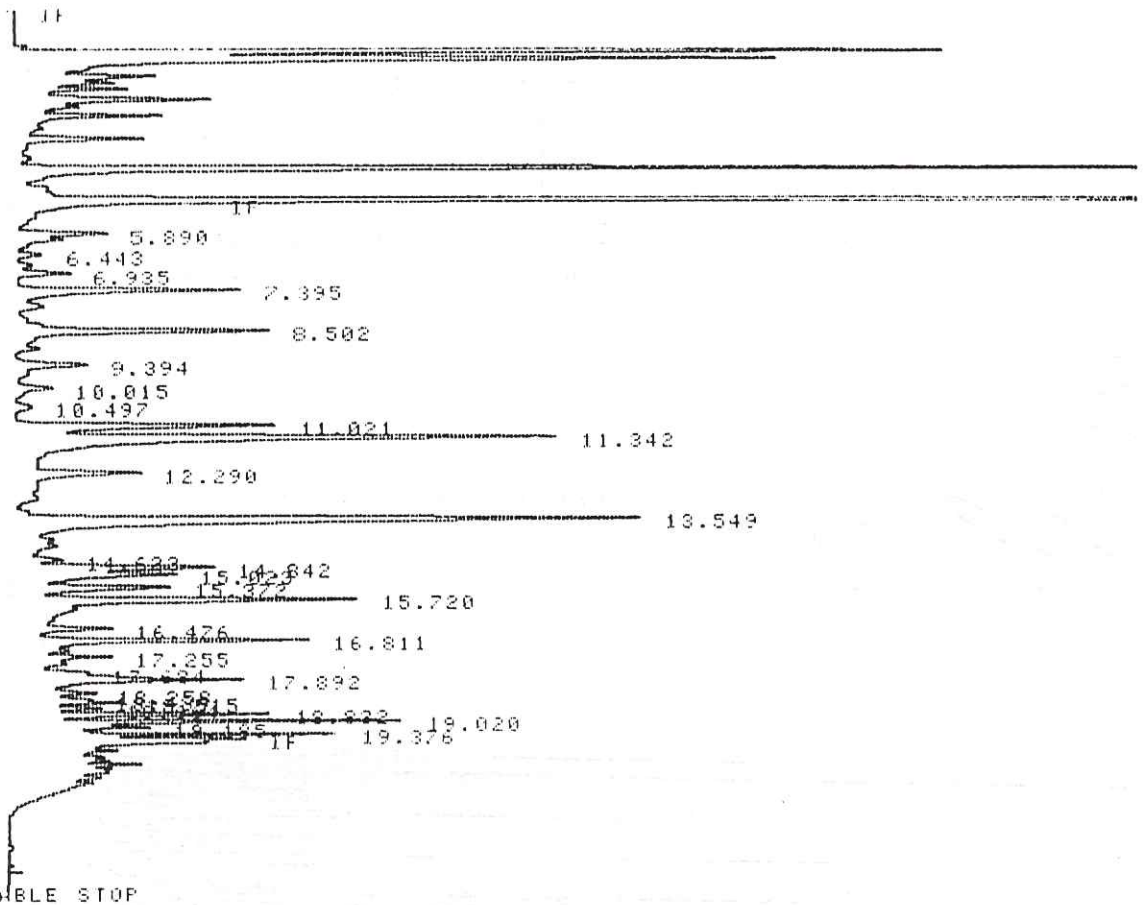
500µL

GC#2 FID

1STD PEAK NOT MATCHED

HEIGHT%

RT	HEIGHT	TYPE	WIDTH	HEIGHT%
5.894	2167	PV	.126	2.47685
6.244	299	VV	.110	.34175
6.444	435	VV	.113	.49720
6.711	250	VV	.123	.28575
6.940	555	VV	.119	.63436
7.403	650	VV	.126	.74294
7.7[illegible]	115	VV	.157	.50863



TIMETABLE STOP

PUM# 5424 AUG 27, 1992 14:30:37

#11 J081119

GC#2 FID

ISTD PEAK NOT MATCHED

HEIGHT%

RT	HEIGHT	TYPE	WIDTH	HEIGHT%
5.890	640	BV	.118	1.75694
6.443	188	VP	.112	.51610
6.935	399	VP	.124	1.09534
7.395	1601	PV	.137	4.39509
8.502	1805	VV	.158	4.95512
9.394	471	PV	.135	1.29300
10.015	260	BP	.170	.71376
10.497	133	PP	.173	.36511
11.021	1828	PV	.144	5.01826
11.3	3798	VV	.180	10.42633

NORTH CREEK ANALYTICAL

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Phone (206) 481-9200 • FAX (206) 485-2992

GeoEngineers, Inc.	Client Project ID:	Unocal, #161-228-R04	Sampled:	Aug 19, 1992
8410 154th Avenue N.E.	Matrix Descript:	Water	Received:	Aug 24, 1992
Redmond, WA 98052	Analysis Method:	WTPH-D	Extracted:	Aug 26, 1992
Attention: Norman Puri	First Sample #:	208-1115	Analyzed:	Aug 31, 1992
			Reported:	Sep 10, 1992

TOTAL PETROLEUM HYDROCARBONS (WTPH-D)

Sample Number	Sample Description	Extractable Hydrocarbons mg/L (ppm)	Surrogate Recovery %
208-1115	MW-1	16	110
208-1116	MW-3	1.8	66
208-1117	MW-5	Bottle Broken	See Chain of Custody
208-1118	MW-6	N.D.	88
BLK082692	Method Blank	N.D.	72

Detection Limits:	**0.25**

Extractable Hydrocarbons are quantitated as Diesel Range Organics (nC12 - nC24). Surrogate recovery reported is for 2-Fluorobiphenyl.
Analytes reported as N.D. were not present above the stated limit of detection.

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Scot Cocanour
Laboratory Director

2081115.GEO <3>

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GeoEngineers, Inc.
8410 154th Avenue N.E.
Redmond, WA 98052
Attention: Norman Puri

Client Project ID: Unocal, #161-228-R04
EPA Method: WTPH-G
Sample Matrix: Water
Units: µg/L

Analyst: R. Lister, K. Wilke
Analyzed: Aug 26, 1992
Reported: Sep 10, 1992

HYDROCARBON QUALITY CONTROL DATA REPORT

ACCURACY ASSESSMENT
Laboratory Control Sample

Gasoline

Spike Conc. Added:	100
Spike Result:	92
% Recovery:	92
Upper Control Limit %:	120
Lower Control Limit %:	80

PRECISION ASSESSMENT
Sample Duplicate

Volatile Hydrocarbons

Sample Number:	208-1101
Original Result:	710
Duplicate Result:	630
Relative % Difference	12
Maximum RPD:	20

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Scot Cocanour
Laboratory Director

$$\%\ \text{Recovery:} \quad \frac{\text{Spike Result}}{\text{Spike Concentration Added}} \times 100$$

$$\text{Relative \% Difference:} \quad \frac{\text{Original Result - Duplicate Result}}{(\text{Original Result + Duplicate Result}) / 2} \times 100$$

2081115.GEO <9>

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Phone (206) 481-9200 • FAX (206) 485-2992

eoEngineers, Inc.
10 154th Avenue N.E.
dmond, WA 98052
ention: Norman Puri

Client Project ID: Unocal, #161-228-R04
EPA Method: WTPH-D
Sample Matrix: Water
Units: mg/L (ppm)

Analyst: S. Kouri

Extracted: Aug 26, 1992
Analyzed: Aug 29, 1992
Reported: Sep 10, 1992

HYDROCARBON QUALITY CONTROL DATA REPORT

ACCURACY ASSESSMENT
Laboratory Control Sample

	Diesel
Spike Conc. Added:	67
Spike Result:	81
% Recovery:	121
Upper Control Limit %:	120
Lower Control Limit %:	80

PRECISION ASSESSMENT
Sample Duplicate

	Extractable Hydrocarbons
Sample Number:	208-0729
Original Result:	N.D.
Duplicate Result:	N.D.
Relative % Difference	Relative Percent Difference values are not reported at sample concentrations of less than five times the detection limit.
Maximum RPD:	20

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oratory Director

$$\text{\% Recovery:} \quad \frac{\text{Spike Result}}{\text{Spike Concentration Added}} \times 100$$

$$\text{Relative \% Difference:} \quad \frac{\text{Original Result - Duplicate Result}}{(\text{Original Result + Duplicate Result}) / 2} \times 100$$

2081115.GEO <10>

NORTH CREEK ANALYTICAL
18939 120th Avenue N.E., Suite 101 • Bothell, WA 98011-2569
Phone (206) 481-9200 • FAX (206) 485-2992

CHAIN OF CUSTODY REPORT

CLIENT: GEO ENGINEERS
ADDRESS: 8410 154TH AVE N.E.
REDMOND, WA. 98052
PHONE: 206-861-6000 FAX: 206-861-6050
PROJECT NAME: UNOCAL / CHELAN
PROJECT NUMBER: 161-228-R04
SAMPLED BY: DJL

REPORT TO: FAX RESULTS TO NORM PURI
BILLING TO: GEO ENGINEERS
P.O. NUMBER:
NCA QUOTE #:

SAME DAY (2-8 HR.) RUSH	(+150%)
NEXT DAY RUSH	(+100%)
2 DAY RUSH	(+80%)
3 DAY RUSH	(+60%)
5 DAY RUSH	(+40%)
10 DAY STANDARD	(LIST PRICE)

SAMPLE IDENTIFICATION: NUMBER OR DESCRIPTION	SAMPLING DATE / TIME	MATRIX (W,S,O)	# OF CONT.	8020 BETX	GREASE 413.2 OIL	TOTAL LEAD	DISSOLVED LEAD	ANALYSIS REQUESTED WTPH-G	WTPH-D	COMMENTS & PRESERVATIVES USED	LABORATORY NUMBER
1 MW-1	8/19/92	W	4	X			X	X	X	DISSOLVED PB SAMPLES WERE FIELD FILTERED	208115
2 MW-3	17:30		4	X			X	X	X		1116
3 MW-5	18:30		4	X			X	X	X	MW-5 TPH-D Bottle	1117
4 MW-6	19:00		4	X			X	X	X	Broken. R	1118
5 DRUM-1	19:50		4	X	X	X					1119
6											
7											
8											
9										TOTAL # OF CONTAINERS	
10										RECEIVED?	

RELINQUISHED BY: Dave Lamoreaux DATE: 8/20/92
FIRM: GEO ENGINEERS TIME: 20:00
RECEIVED BY: Jan Gillin DATE: 8/24/92
FIRM: TIME: 8:00

RELINQUISHED BY: DATE:
FIRM: TIME:
RECEIVED BY: DATE:
FIRM: TIME:

SAMPLE RECEIPT INFORMATION: CONTAINER CONDITION?: (GOOD) VIOLATED COOL (4° C)? YES NO
CUSTODY SEALS? GOOD VIOLATED NOT USED HAZARDOUS SAMPLES?: NO YES; DESCRIBE ON BACK

PAGE OF

NORTH CREEK ANALYTICAL

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Phone (206) 481-9200 • FAX (206) 485-2992

GeoEngineers, Inc.	Client Project ID: Unocal, #161-228-R04	Analyst:	S. Kouri
8410 154th Avenue N.E.	EPA Method: WTPH-D		
Redmond, WA 98052	Sample Matrix: Water	Extracted:	Aug 26, 1992
Attention: Norman Puri	Units: mg/L (ppm)	Analyzed:	Aug 29, 1992
		Reported:	Sep 10, 1992

HYDROCARBON QUALITY CONTROL DATA REPORT

ACCURACY ASSESSMENT
Laboratory Control Sample

Diesel

Spike Conc. Added:	67
Spike Result:	81
% Recovery:	121
Upper Control Limit %:	120
Lower Control Limit %:	80

PRECISION ASSESSMENT
Sample Duplicate

Extractable Hydrocarbons

Sample Number:	208-0729
Original Result:	N.D.
Duplicate Result:	N.D.
Relative % Difference	Relative Percent Difference values are not reported at sample concentrations of less than five times the detection limit.
Maximum RPD:	20

NORTH CREEK ANALYTICAL inc

Scot Cocanour
Laboratory Director

% Recovery: $\frac{\text{Spike Result}}{\text{Spike Concentration Added}} \times 100$

Relative % Difference: $\frac{\text{Original Result - Duplicate Result}}{(\text{Original Result + Duplicate Result}) / 2} \times 100$

2081115.GEO <10>

NORTH CREEK ANALYTICAL

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Phone (206) 481-9200 • FAX (206) 485-2992

GeoEngineers, Inc.
8410 154th Avenue N.E.
Redmond, WA 98052
Attention: Norman Puri

Client Project ID: Unocal, #161-228-R04
Sample Matrix : Water
Units: µg/L (ppb)

Analyst: F. Shino

Reported: Sep 10, 1992

INORGANIC QUALITY CONTROL DATA REPORT

ANALYTE	Lead
EPA Method:	7421
Date Analyzed:	9/2/92

ACCURACY ASSESSMENT

LCS Spike Conc. Added:	60
LCS Spike Result:	70
LCS Spike % Recovery:	117
Upper Control Limit:	136
Lower Control Limit:	67
Matrix Spike Sample #:	208-1118
Matrix Spike % Recovery:	98

PRECISION ASSESSMENT

Sample #:	208-1118
Original:	N.D.
Duplicate:	N.D.
Relative % Difference:	0

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Scot Cocanour
Laboratory Director

Lab Control Sample % Recovery:	Conc. of L.C.S. / L.C.S. Spike Conc. Added	x 100
Relative % Difference:	Original Result - Duplicate Result / (Original Result + Duplicate Result) / 2	x 100

2081115.GEO <11>

NORTH CREEK ANALYTICAL
18939 120th Avenue N.E., Suite 101 • Bothell, WA 98011-2569
Phone (206) 481-9200 • FAX (206) 485-2992

CHAIN OF CUSTODY REPORT

CLIENT: GEO ENGINEERS
ADDRESS: 8410 154TH AVE N.E. REDMOND, WA. 98052
PHONE: 206-861-6000 FAX: 206-861-6050
PROJECT NAME: UNOCAL / CHELAN
PROJECT NUMBER: 161-228-R04
SAMPLED BY: DJL

REPORT TO: FAX RESULTS TO NORM PURI
BILLING TO: GEO ENGINEERS
P.O. NUMBER:
NCA QUOTE #:

SAME DAY (2-8 HR.) RUSH (+150%)
NEXT DAY RUSH (+100%)
2 DAY RUSH (+80%)
3 DAY RUSH (+60%)
5 DAY RUSH (+40%)
10 DAY STANDARD (LIST PRICE)

	SAMPLE IDENTIFICATION: NUMBER OR DESCRIPTION	SAMPLING DATE / TIME	MATRIX (W,S,O)	# OF CONT.	ANALYSIS REQUESTED: 8020 BETX	413.2 GREASE OIL	TOTAL LEAD	DISSOLVED LEAD	WTPH-G	WTPH-D	COMMENTS & PRESERVATIVES USED	LABORATORY NUMBER
1	MW-1	8/19/92	W	4	X			X	X	X	DISSOLVED PB SAMPLES WERE FIELD FILTERED	208115
2	MW-3	17:30		4	X			X	X	X		1116
3	MW-5	18:30		4	X			X	X	X	MW-5 TPH-D Bottle	1117
4	MW-6	19:00		4	X			X	X	X	Broken. R	1118
5	DRUM-1	19:50		4	X	X	X					1119
6												
7												
8												
9											TOTAL # OF CONTAINERS	
10											RECEIVED?	

RELINQUISHED BY: Dan Garrow DATE: 8/20/92
FIRM: GEO ENGINEERS TIME: 20:00
RECEIVED BY: DATE: 8/24/92
FIRM: TIME: 8:00

RELINQUISHED BY: DATE:
FIRM: TIME:
RECEIVED BY: DATE:
FIRM: TIME:

SAMPLE RECEIPT INFORMATION: CONTAINER CONDITION?: (GOOD) VIOLATED (COOL (4° C)? YES NO
CUSTODY SEALS? GOOD VIOLATED NOT USED HAZARDOUS SAMPLES?: NO YES; DESCRIBE ON BACK
PAGE OF

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. # 9211-167

December 1, 1992

GeoEngineers
DEC 0 2 1992
Routing NLP
File

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

Attention : Norm Puri

Project Number : 0161-228-R04 Task 2.1

Project Name : Unocal - Chelan

On November 16, 1992, Analytical Technologies, Inc., received three 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

NORTH CREEK ANALYTICAL

18939 120th Avenue N.E., Suite 101 • Bothell, WA 98011-2569
Phone (206) 481-9200 • FAX (206) 485-2992

GeoEngineers, Inc.	Client Project ID:	Unocal, #161-228-R04	Sampled:	Aug 19, 1992
8410 154th Avenue N.E.	Matrix Descript:	Water	Received:	Aug 24, 1992
Redmond, WA 98052	Analysis Method:	WTPH-D	Extracted:	Aug 26, 1992
Attention: Norman Puri	First Sample #:	208-1115	Analyzed:	Aug 31, 1992
			Reported:	Sep 10, 1992

TOTAL PETROLEUM HYDROCARBONS (WTPH-D)

Sample Number	Sample Description	Extractable Hydrocarbons mg/L (ppm)	Surrogate Recovery %
208-1115	MW-1	16	110
208-1116	MW-3	1.8	66
208-1117	MW-5	Bottle Broken	See Chain of Custody
208-1118	MW-6	N.D.	88
BLK082692	Method Blank	N.D.	72

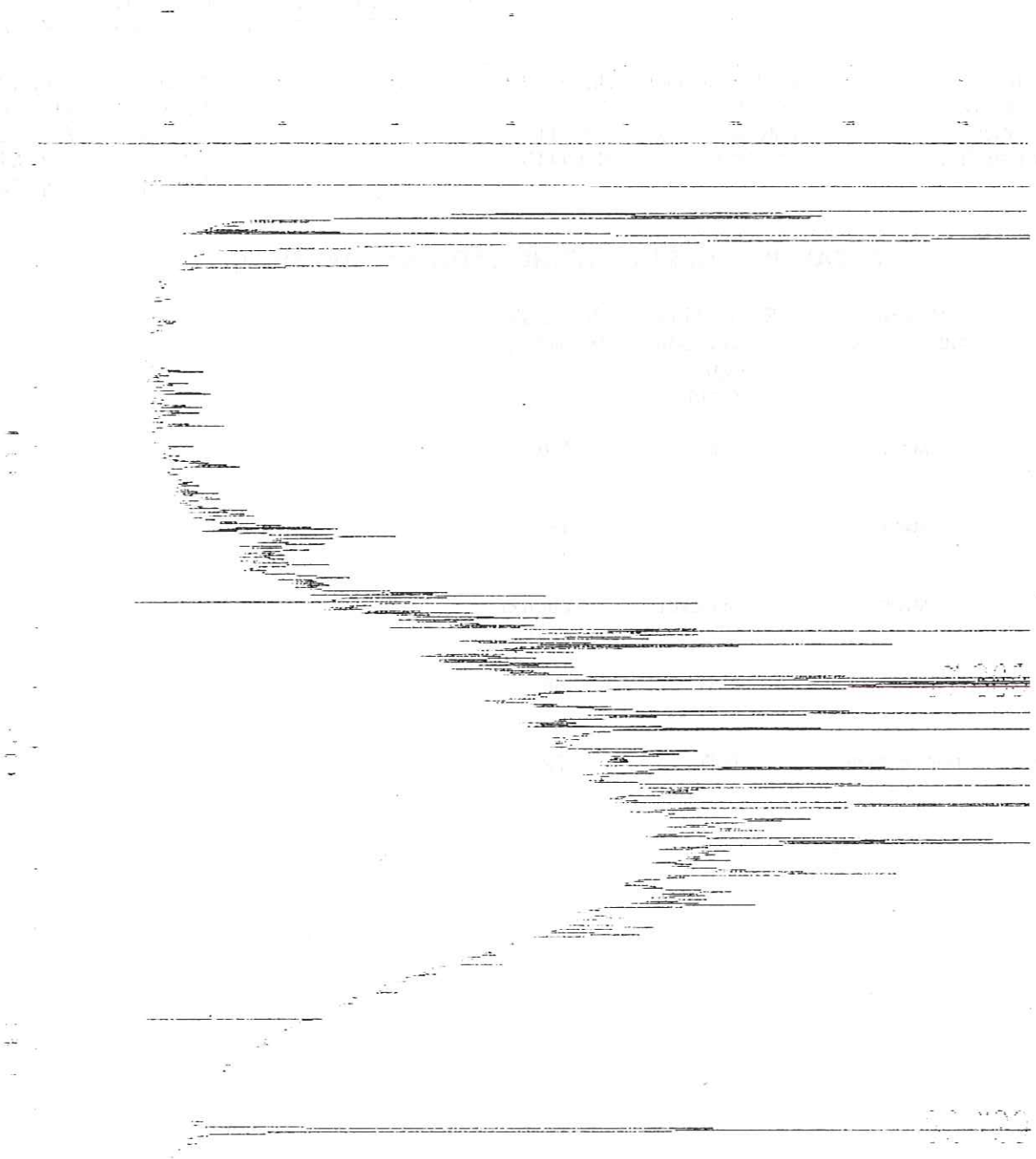
Detection Limits:	**0.25**

Extractable Hydrocarbons are quantitated as Diesel Range Organics (nC12 - nC24). Surrogate recovery reported is for 2-Fluorobiphenyl.
Analytes reported as N.D. were not present above the stated limit of detection.

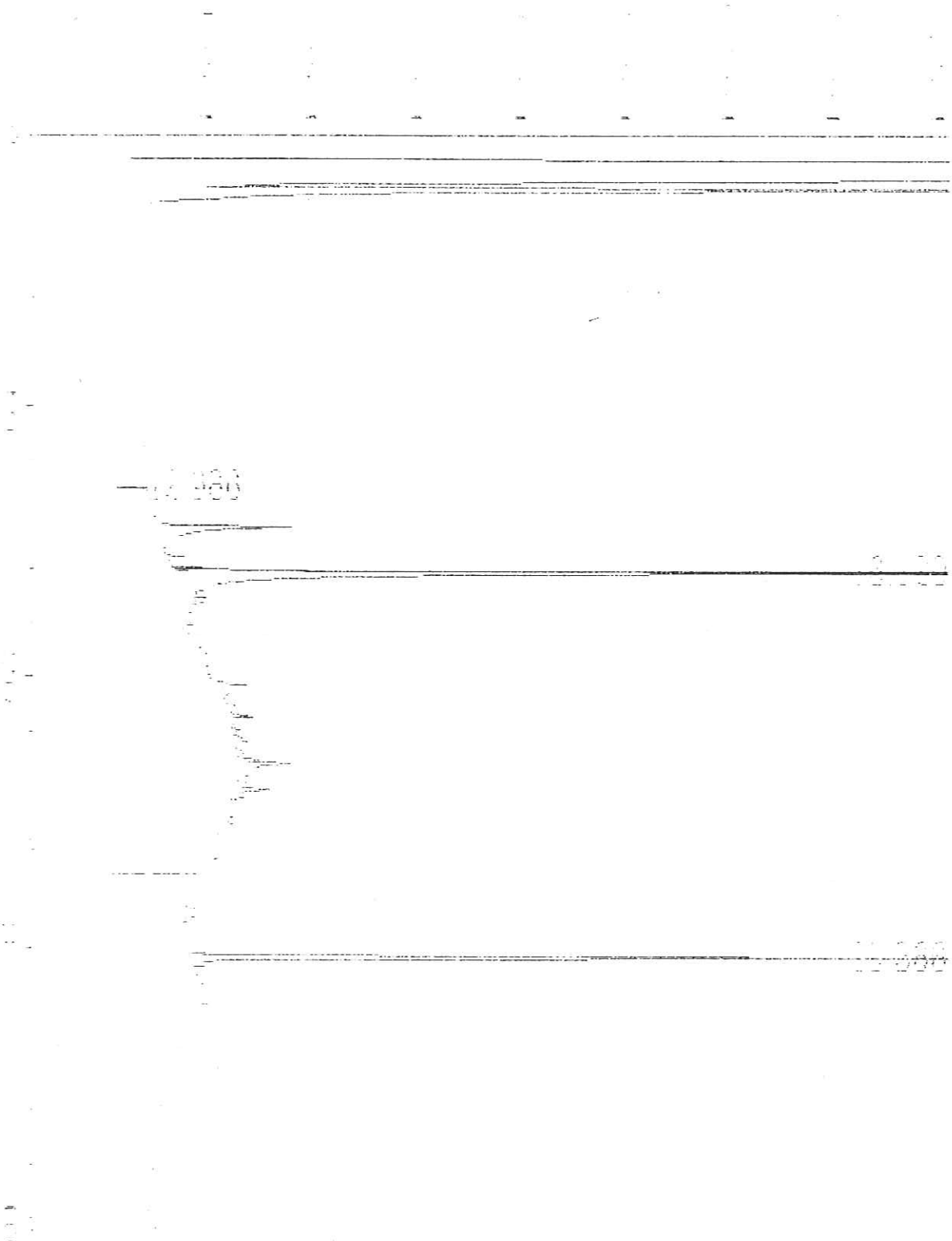
NORTH CREEK ANALYTICAL inc

Scot Cocanour
Laboratory Director

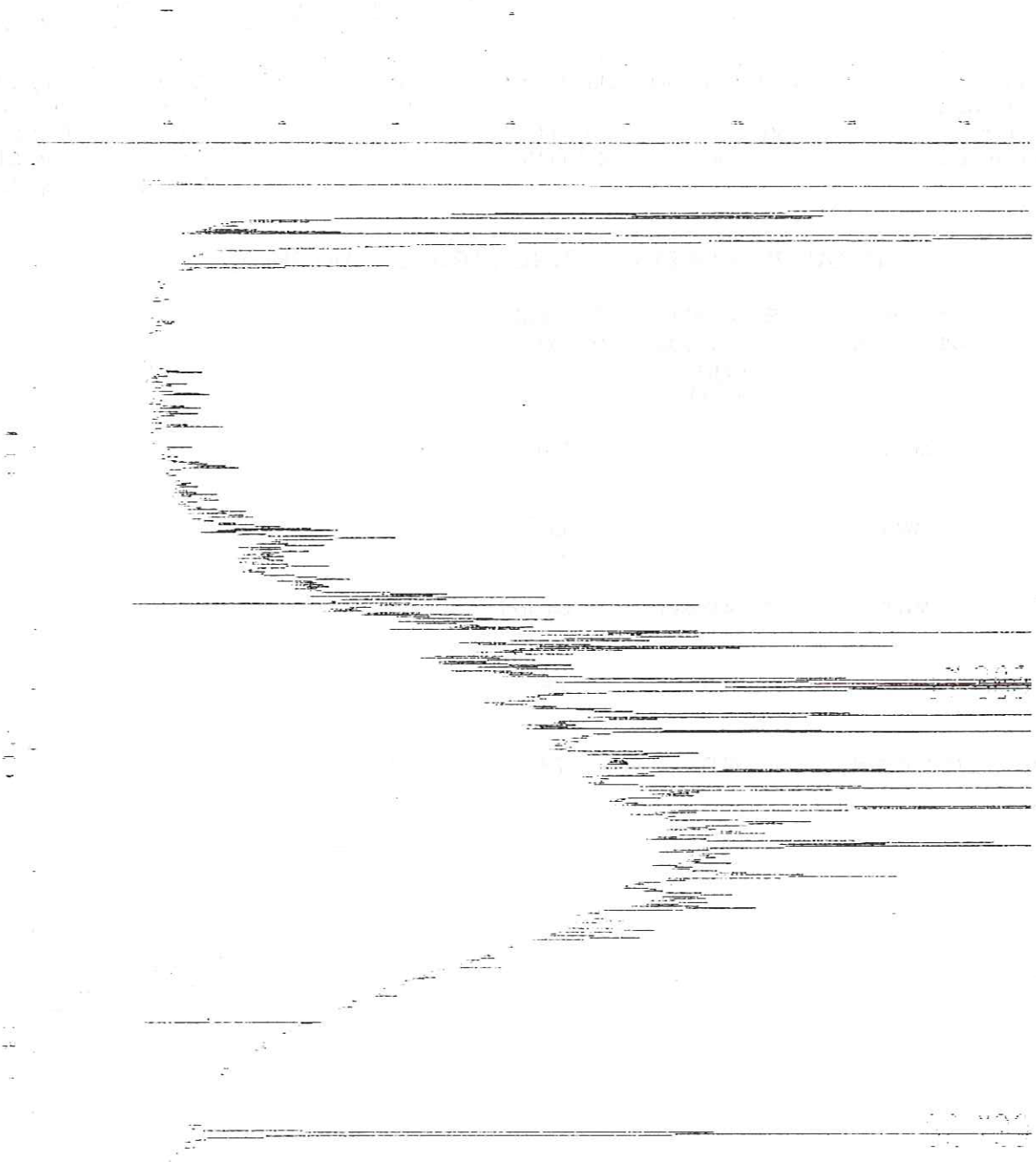
2081115.GEO <3>



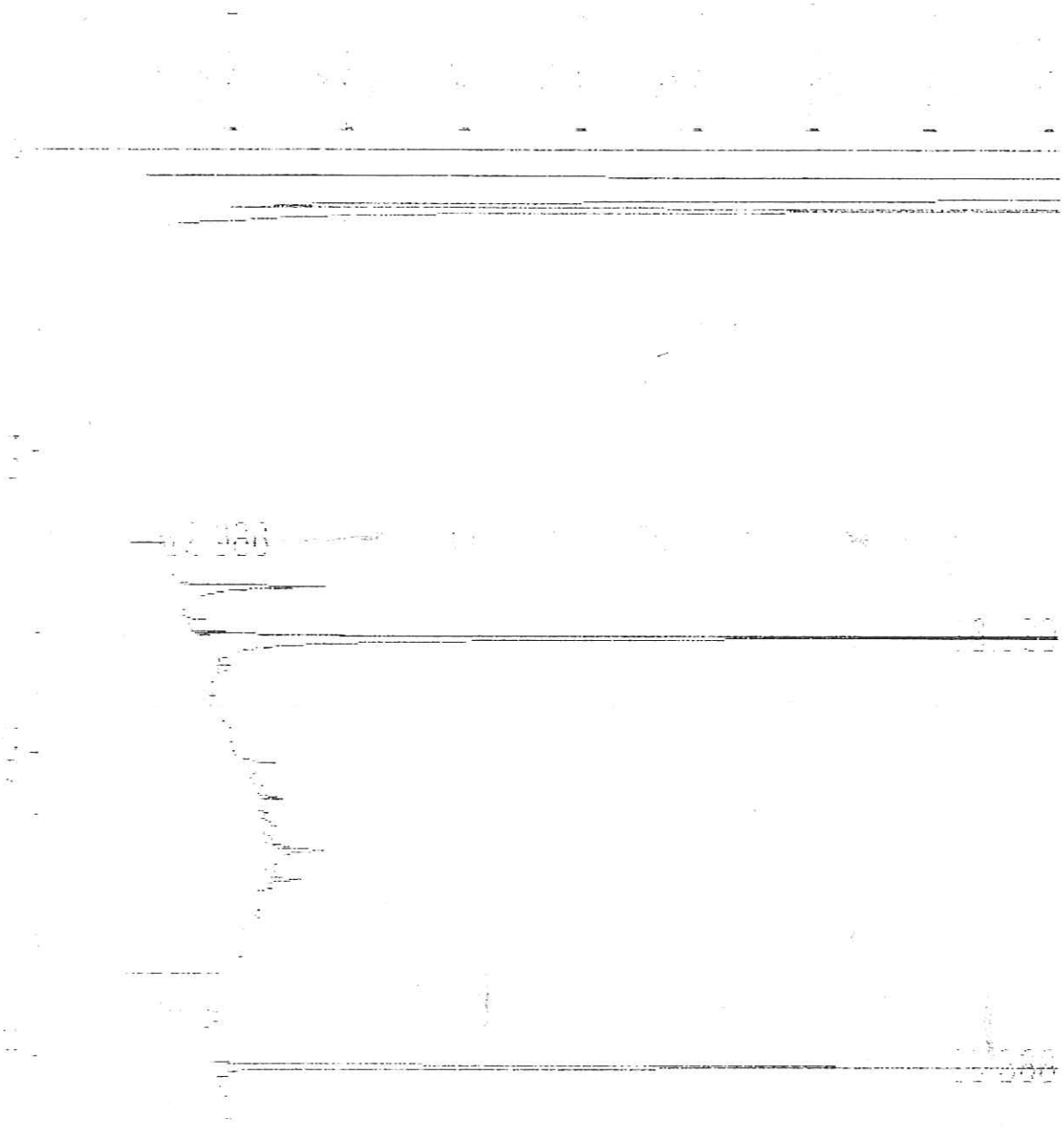
Data File Name	: C:\HPCHEM\1\DATA\AUG278\030F1501.D		
Operator	: LAURA	Page Number	: 1
Instrument	: PHIL	Vial Number	: 30
Sample Name	: 208-1115	Injection Number	: 1
Run Time Bar Code:		Sequence Line	: 15
Acquired on	: 31 Aug 92 01:39 AM	Instrument Method:	TPH1F.MTH
Report Created on:	06 Sep 92 08:35 PM	Analysis Method	: DEFAULT.MTH



Data File Name	: C:\HPCHEM\3\DATA\AUG28\060R0601.D		
Operator	: LAURA	Page Number	: 1
Instrument	: BOB	Vial Number	: 60
Sample Name	: 208-1116	Injection Number	: 1
Run Time Bar Code:		Sequence Line	: 6
Acquired on	: 28 Aug 92 11:46 PM	Instrument Method	: TPH3R.MTH
Report Created on	: 06 Sep 92 08:30 PM	Analysis Method	: DEFAULT.MTH

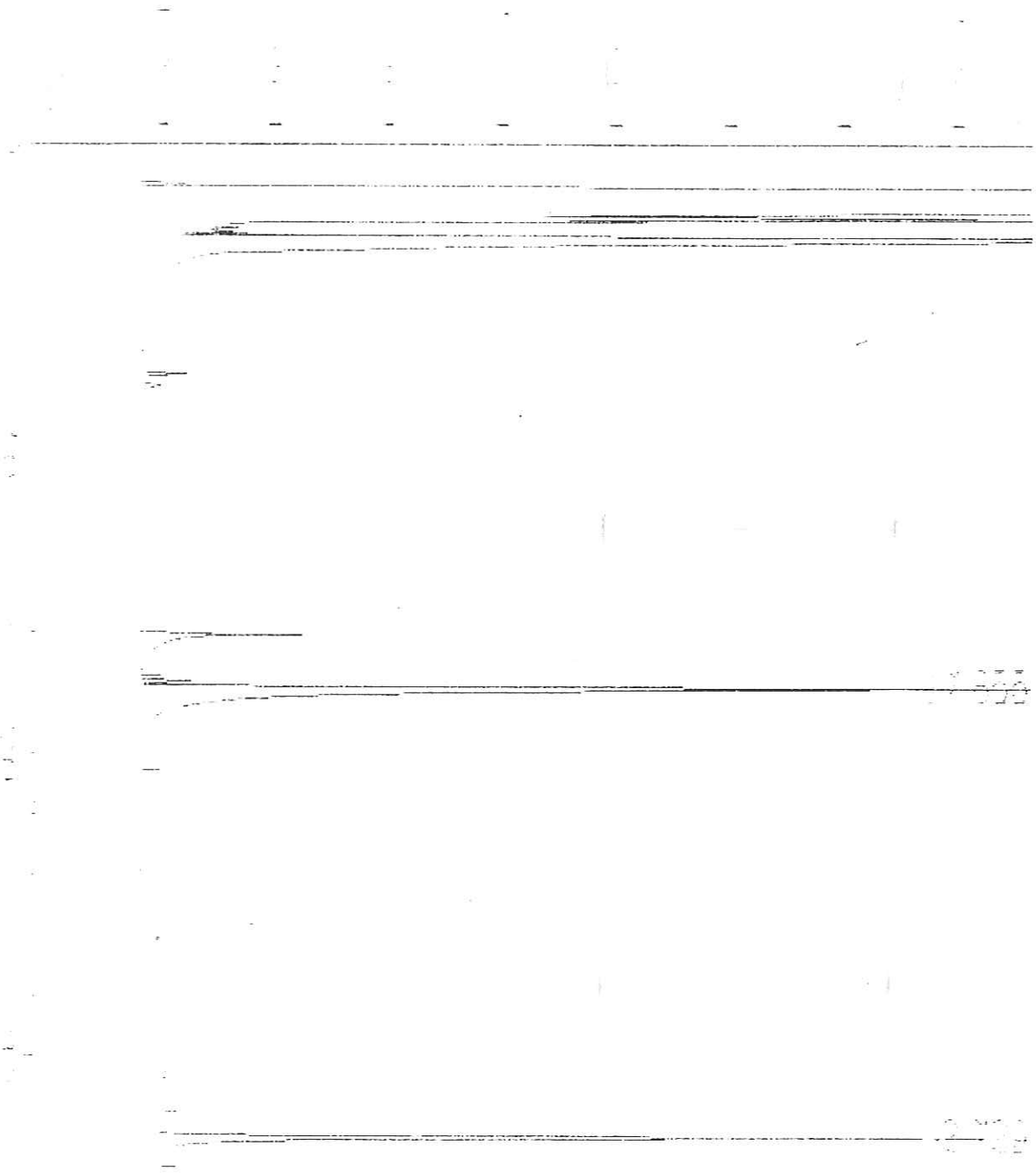


Data File Name	: C:\HPCHEM\1\DATA\AUG27B\030F1501.D		
Operator	: LAURA	Page Number	: 1
Instrument	: PHIL	Vial Number	: 30
Sample Name	: 208-1115	Injection Number	: 1
Run Time Bar Code:		Sequence Line	: 15
Acquired on	: 31 Aug 92 01:09 AM	Instrument Method:	TPH1F.MTH
Report Created on:	06 Sep 92 08:35 PM	Analysis Method	: DEFAULT.MTH

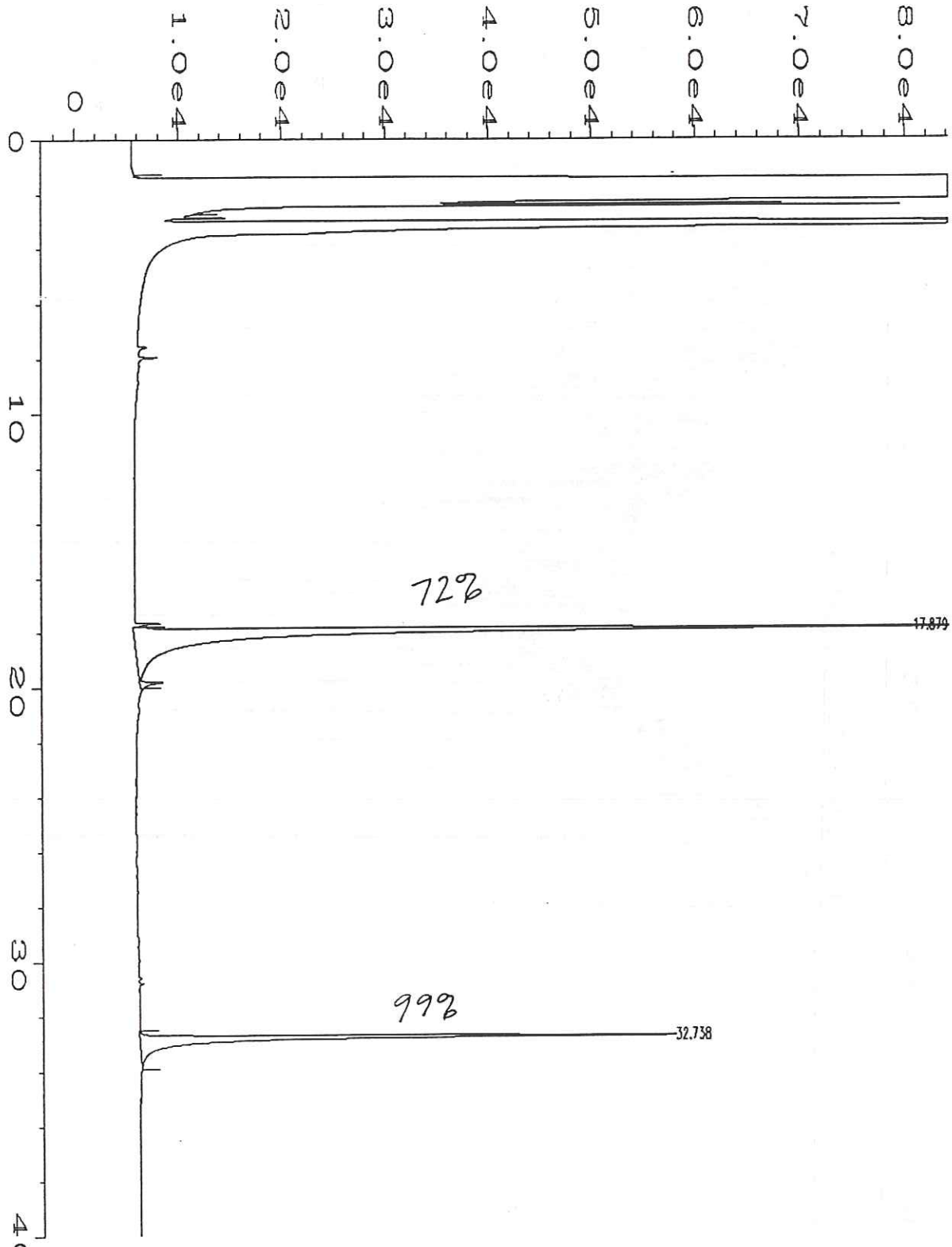


Data File Name : C:\HPCHEM\3\DATA\AUG28\060R0601.D
Operator : LAURA
Instrument : BOB
Sample Name : 208-1116
Run Time Bar Code:
Acquired on : 28 Aug 92 11:46 PM
Report Created on: 06 Sep 92 08:30 PM

Page Number : 1
Vial Number : 60
Injection Number : 1
Sequence Line : 6
Instrument Method: TPH3R.MTH
Analysis Method : DEFAULT.MTH

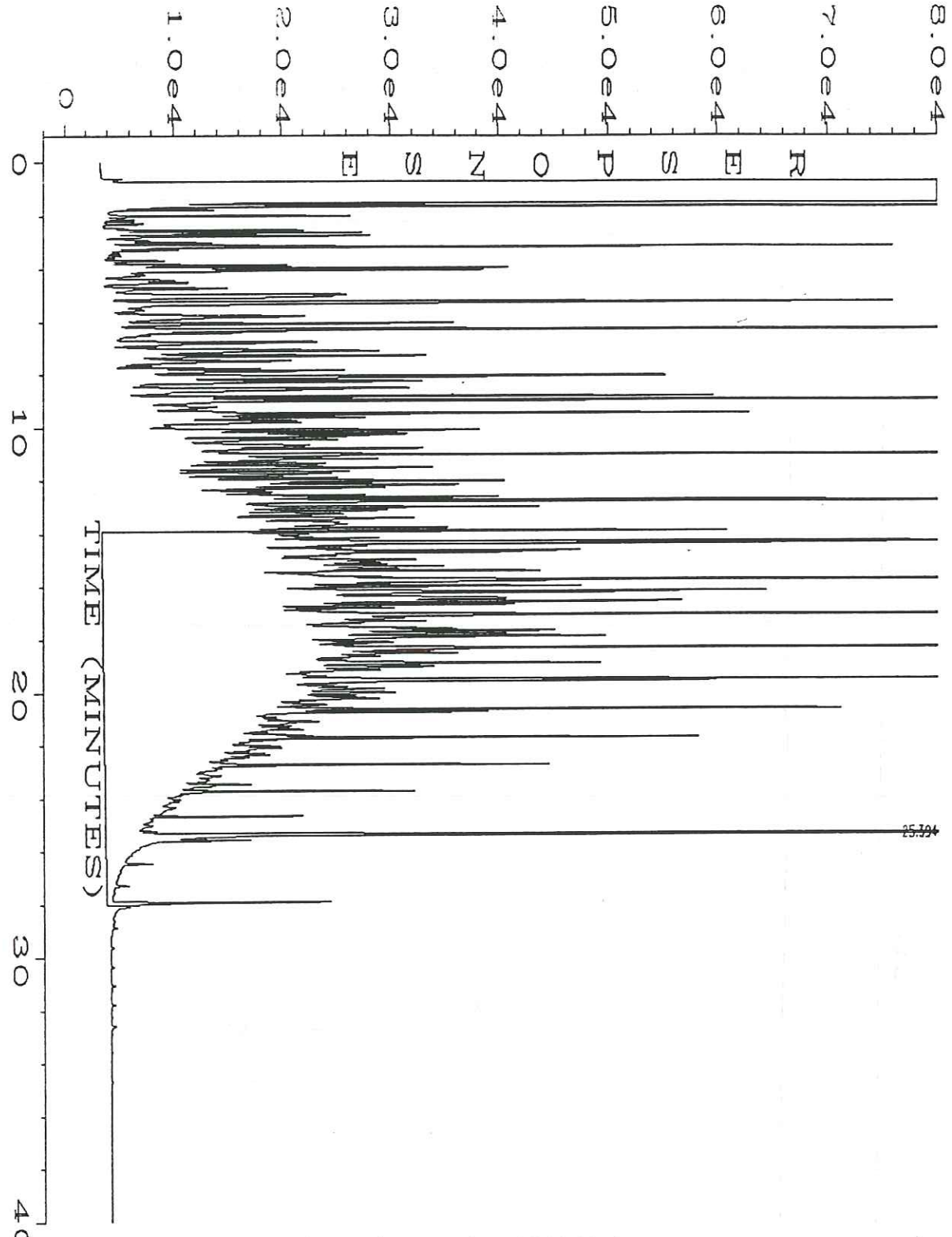


Data File Name	: C: HPCHEM\1 DATA\AUG27B\032F1501.D		
Operator	: LAURA	Page Number	: 1
Instrument	: PHIL	Vial Number	: 32
Sample Name	: 208-1118	Injection Number	: 1
Run Time Bar Code:		Sequence Line	: 15
Acquired on	: 31 Aug 92 03:19 AM	Instrument Method	: TPH1F.MTH
Report Created on	: 06 Sep 92 08:43 PM	Analysis Method	: DEFAULT.MTH



Data File Name : C:\HPCHEM\1\DATA\AUG27B\010F0601.D
Operator : LAURA
Instrument : PHIL
Sample Name : BLK0826W 8015
Run Time Bar Code:
Acquired on : 29 Aug 92 03:53 AM
Report Created on: 08 Sep 92 09:18 AM

Page Number : 1
Vial Number : 10
Injection Number : 1
Sequence Line : 6
Instrument Method: TPH1F.MTH
Analysis Method : TPH1F.MTH



Data File Name : C:\HPCHEM\3\DATA\SEP02\006F0201.D
Operator : LAURA
Instrument : BOB
Sample Name : STD8XX 11X
Run Time Bar Code:
Acquired on : 02 Sep 92 11:31 PM
Report Created on: 03 Sep 92 00:19 AM

Page Number : 1
Vial Number : 6
Injection Number : 1
Sequence Line : 2
Instrument Method: STD3F.MTH
Analysis Method : STD3F.MTH

NORTH CREEK ANALYTICAL

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Phone (206) 481-9200 • FAX (206) 485-2992

GeoEngineers, Inc.	Client Project ID:	Unocal, #161-228-R04	Sampled:	Aug 19, 1992
8410 154th Avenue N.E.	Matrix Descript:	Water	Received:	Aug 24, 1992
Redmond, WA 98052	Analysis Method:	EPA 413.2 (I.R.)	Extracted:	Aug 25, 1992
Attention: Norman Puri	First Sample #:	208-1119	Analyzed:	Aug 25, 1992
			Reported:	Sep 10, 1992

TOTAL RECOVERABLE OIL & GREASE

Sample Number	Sample Description	Oil & Grease mg/L (ppm)
208-1119	DRUM-1	1.3
BLK082592	Method Blank	N.D.

Detection Limits:	1.0

Analytes reported as N.D. were not present above the stated limit of detection.

NORTH CREEK ANALYTICAL inc

Scot Cocanour
Laboratory Director

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GeoEngineers, Inc.	Client Project ID:	Unocal, #161-228-R04	Sampled:	Aug 19, 1992
8410 154th Avenue N.E.	Analysis Method:	EPA 7421	Received:	Aug 24, 1992
Redmond, WA 98052	Analysis for:	Dissolved Lead	Digested:	Sep 1, 1992
Attention: Norman Puri	First Sample #:	208-1115	Analyzed:	Sep 2, 1992
	Matrix:	Water	Reported:	Sep 10, 1992

METALS ANALYSIS FOR: Dissolved Lead

Sample Number	Sample Description	Detection Limit µg/L (ppb)	Sample Result µg/L (ppb)
208-1115	MW-1	2.0	17
208-1116	MW-3	2.0	N.D.
208-1117	MW-5	2.0	N.D.
208-1118	MW-6	2.0	N.D.
BLK090192	Method Blank	2.0	N.D.

Analytes reported as N.D. were not present above the stated limit of detection.

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Phone (206) 481-9200 • FAX (206) 485-2992

GeoEngineers, Inc.	Client Project ID:	Unocal, #161-228-R04	Sampled:	Aug 19, 1992
8410 154th Avenue N.E.	Analysis Method:	EPA 7421	Received:	Aug 24, 1992
Redmond, WA 98052	Analysis for:	Total Lead	Digested:	Sep 1, 1992
Attention: Norman Puri	First Sample #:	208-1119	Analyzed:	Sep 2, 1992
	Matrix:	Water	Reported:	Sep 10, 1992

METALS ANALYSIS FOR: Total Lead

Sample Number	Sample Description	Detection Limit µg/L (ppb)	Sample Result µg/L (ppb)
208-1119	DRUM-1	2.0	11
BLK090192	Method Blank	2.0	N.D.

Analytes reported as N.D. were not present above the stated limit of detection.

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Scot Cocanour
Laboratory Director

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GeoEngineers, Inc.	Client Project ID:	Unocal, #161-228-R04	Sampled:	Aug 19, 1992
8410 154th Avenue N.E.	Matrix Descript:	Water	Received:	Aug 24, 1992
Redmond, WA 98052	Analysis Method:	EPA 413.2 (I.R.)	Extracted:	Aug 25, 1992
Attention: Norman Puri	First Sample #:	208-1119	Analyzed:	Aug 25, 1992
			Reported:	Sep 10, 1992

TOTAL RECOVERABLE OIL & GREASE

Sample Number	Sample Description	Oil & Grease mg/L (ppm)
208-1119	DRUM-1	1.3
BLK082592	Method Blank	N.D.

Detection Limits:	1.0

Analytes reported as N.D. were not present above the stated limit of detection.

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Laboratory Director

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Phone (206) 481-9200 • FAX (206) 485-2992

GeoEngineers, Inc.	Client Project ID: Unocal, #161-228-R04	Analyst:	S. Kimball
8410 154th Avenue N.E.	EPA Method: WTPH-413.2		
Redmond, WA 98052	Sample Matrix: Water	Extracted:	Aug 25, 1992
Attention: Norman Puri	Units: mg/L (ppm)	Analyzed:	Aug 25, 1992
		Reported:	Sep 10, 1992

HYDROCARBON QUALITY CONTROL DATA REPORT

ACCURACY ASSESSMENT
Laboratory Control Sample

Oil and Grease

Spike Conc. Added:	3.0
Spike Result:	2.8
% Recovery:	93
Upper Control Limit %:	120
Lower Control Limit %:	80

PRECISION ASSESSMENT
Sample Duplicate

Oil and Grease

Sample Number:	208-1119
Original Result:	1.3
Duplicate Result:	1.3
Relative % Difference	0
Maximum RPD:	20

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Laboratory Director

% Recovery: $\frac{\text{Spike Result}}{\text{Spike Concentration Added}} \times 100$

Relative % Difference: $\frac{\text{Original Result - Duplicate Result}}{(\text{Original Result + Duplicate Result}) / 2} \times 100$

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GeoEngineers, Inc.	Client Proj. ...	Unocal, #161-228-R04	Sampled:	Aug 19, 1992
8410 154th Avenue N.E.	Analysis Method:	EPA 7421	Received:	Aug 24, 1992
Redmond, WA 98052	Analysis for:	Total Lead	Digested:	Sep 1, 1992
Attention: Norman Puri	First Sample #:	208-1119	Analyzed:	Sep 2, 1992
	Matrix:	Water	Reported:	Sep 10, 1992

METALS ANALYSIS FOR: Total Lead

Sample Number	Sample Description	Detection Limit µg/L (ppb)	Sample Result µg/L (ppb)
208-1119	DRUM-1	2.0	11
BLK090192	Method Blank	2.0	N.D.

Analytes reported as N.D. were not present above the stated limit of detection.

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Scot Cocanour
Laboratory Director

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Phone (206) 481-9200 • FAX (206) 485-2992

GeoEngineers, Inc.
8410 154th Avenue N.E.
Redmond, WA 98052
Attention: Norman Puri

Client Project ID: Unocal, #161-228-R04
EPA Method: 5030/8020
Sample Matrix: Water
Units: µg/L (ppb)
QC Sample #: 208-1102

Analyst: R. Lister, K. Wilke
Analyzed: Aug 26, 1992
Reported: Sep 10, 1992

QUALITY CONTROL DATA REPORT

ANALYTE	Benzene	Toluene	Ethyl Benzene	Xylenes
Sample Conc.:	N.D.	N.D.	N.D.	N.D.
Spike Conc. Added:	5.0	5.0	5.0	15.0
Conc. Matrix Spike:	4.6	4.4	4.4	13.6
Matrix Spike % Recovery:	92	88	88	91
Conc. Matrix Spike Dup.:	4.8	4.6	4.6	13.6
Matrix Spike Duplicate % Recovery:	96	92	92	91
Upper Control Limit %:	112	105	109	108
Lower Control Limit %:	85	74	87	79
Relative % Difference:	4.3	4.4	4.4	0
Maximum RPD:	9.9	17	13	17

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.aboratory Director

$$\%\ \text{Recovery:} = \frac{\text{Conc. of M.S.} - \text{Conc. of Sample}}{\text{Spike Conc. Added}} \times 100$$

$$\text{Relative \% Difference:} = \frac{\text{Conc. of M.S.} - \text{Conc. of M.S.D.}}{(\text{Conc. of M.S.} + \text{Conc. of M.S.D.}) / 2} \times 100$$

2081115.GEO <8>

NORTH CREEK ANALYTICAL

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Phone (206) 481-9200 • FAX (206) 485-2992

GeoEngineers, Inc.	Client Project ID: Unocal, #161-228-R04	Analyst:	R. Lister
8410 154th Avenue N.E.	EPA Method: WTPH-G		K. Wilke
Redmond, WA 98052	Sample Matrix: Water		
Attention: Norman Puri	Units: µg/L	Analyzed:	Aug 26, 1992
		Reported:	Sep 10, 1992

HYDROCARBON QUALITY CONTROL DATA REPORT

ACCURACY ASSESSMENT
Laboratory Control Sample

Gasoline

Spike Conc. Added:	100
Spike Result:	92
% Recovery:	92
Upper Control Limit %:	120
Lower Control Limit %:	80

PRECISION ASSESSMENT
Sample Duplicate

Volatile Hydrocarbons

Sample Number:	208-1101
Original Result:	710
Duplicate Result:	630
Relative % Difference	12
Maximum RPD:	20

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Scot Cocanour
Laboratory Director

$$\text{\% Recovery:} \quad \frac{\text{Spike Result}}{\text{Spike Concentration Added}} \times 100$$

$$\text{Relative \% Difference:} \quad \frac{\text{Original Result - Duplicate Result}}{(\text{Original Result + Duplicate Result}) / 2} \times 100$$

2081115.GEO <9>

Analytical Technologies, Inc.

ATI I.D. # 9211-167

SAMPLE CROSS REFERENCE SHEET

CLIENT : GEOENGINEERS, INC.
PROJECT # : 0161-228-R04
PROJECT NAME : UNOCAL - CHELAN

ATI #	CLIENT DESCRIPTION	DATE SAMPLED	MATRIX
9211-167-1	MW-7-10	11/14/92	SOIL
9211-167-2	MW-7-11	11/14/92	SOIL
9211-167-3	S-1	11/14/92	SOIL

----- TOTALS -----

MATRIX	# SAMPLES
SOIL	3

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 Technologies, Inc.

ATI I.D. # 9211-167

ANALYTICAL SCHEDULE

CLIENT : GEOENGINEERS, INC.
PROJECT # : 0161-228-R04
PROJECT NAME : UNOCAL - CHELAN

ANALYSIS	TECHNIQUE	REFERENCE	LAB
BETX	GC/PID	EPA 8020	R
TOTAL PETROLEUM HYDROCARBONS	GC/FID	WA DOE WTPH-G	R
TOTAL PETROLEUM HYDROCARBONS	GC/FID	WA DOE WTPH-D	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

Analytical Technologies, Inc.

ATI I.D. # 9211-167

VOLATILE ORGANIC ANALYSIS
DATA SUMMARY

CLIENT	: GEOENGINEERS, INC.	DATE SAMPLED	: N/A
PROJECT #	: 0161-228-R04	DATE RECEIVED	: N/A
PROJECT NAME	: UNOCAL - CHELAN	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	RESULT
BENZENE	<0.025
ETHYLBENZENE	<0.025
TOLUENE	<0.025
TOTAL XYLENES	<0.025

SURROGATE PERCENT RECOVERY		LIMITS
BROMOFLUOROBENZENE	102	52 - 116

Analytical Technologies, Inc.

ATI I.D. # 9211-167-1

VOLATILE ORGANIC ANALYSIS
DATA SUMMARY

CLIENT	: GEOENGINEERS, INC.	DATE SAMPLED	: 11/14/92
PROJECT #	: 0161-228-R04	DATE RECEIVED	: 11/16/92
PROJECT NAME	: UNOCAL - CHELAN	DATE EXTRACTED	: 11/17/92
CLIENT I.D.	: MW-7-10	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	RESULT
BENZENE	<0.032
ETHYLBENZENE	<0.032
TOLUENE	0.049
TOTAL XYLENES	<0.032

SURROGATE PERCENT RECOVERY		LIMITS
BROMOFLUOROBENZENE	81	52 - 116

AnalyticalTechnologies,Inc.

ATI I.D. # 9211-167-2

VOLATILE ORGANIC ANALYSIS
DATA SUMMARY

CLIENT	: GEOENGINEERS, INC.	DATE SAMPLED	: 11/14/92
PROJECT #	: 0161-228-R04	DATE RECEIVED	: 11/16/92
PROJECT NAME	: UNOCAL - CHELAN	DATE EXTRACTED	: 11/17/92
CLIENT I.D.	: MW-7-11	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	RESULT
BENZENE	<0.032
ETHYLBENZENE	<0.032
TOLUENE	0.040
TOTAL XYLENES	<0.032

SURROGATE PERCENT RECOVERY		LIMITS
BROMOFLUOROBENZENE	86	52 - 116

Analytical Technologies, Inc.

ATI I.D. # 9211-167-3

VOLATILE ORGANIC ANALYSIS
DATA SUMMARY

CLIENT	: GEOENGINEERS, INC.	DATE SAMPLED	: 11/14/92
PROJECT #	: 0161-228-R04	DATE RECEIVED	: 11/16/92
PROJECT NAME	: UNOCAL - CHELAN	DATE EXTRACTED	: 11/17/92
CLIENT I.D.	: S-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	RESULT	
BENZENE	<0.027	
ETHYLBENZENE	1.2	
TOLUENE	0.51	
TOTAL XYLENES	590	D

SURROGATE PERCENT RECOVERY		LIMITS
BROMOFLUOROBENZENE	120F	52 - 116

D = Value from a 100 fold diluted analysis.
F = Out of limits due to matrix interference.

Analytical Technologies, Inc.

ATI I.D. # 9211-167

VOLATILE ORGANIC ANALYSIS
QUALITY CONTROL DATA

CLIENT : GEOENGINEERS, INC.
PROJECT # : 0161-228-R04
PROJECT NAME : UNOCAL - CHELAN
EPA METHOD : 8020 (BETX)
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	SPIKE ADDED	SPIKED RESULT	% REC.	DUP. SPIKED RESULT	DUP. % REC.	RPD
BENZENE	<0.025	1.00	0.779	78	0.825	83	6
TOLUENE	<0.025	1.00	0.839	84	0.884	88	5
TOTAL XYLENES	<0.025	2.00	1.60	80	1.74	87	8

CONTROL LIMITS	% REC.	RPD
BENZENE	35 - 113	20
TOLUENE	43 - 107	20
TOTAL XYLENES	46 - 114	20

SURROGATE RECOVERIES	SPIKE	DUP. SPIKE	LIMITS
BROMOFLUOROBENZENE	88	99	52 - 116

Analytical Technologies, Inc.

ATI I.D. # 9211-167

VOLATILE ORGANIC ANALYSIS
QUALITY CONTROL DATA

CLIENT	: GEOENGINEERS, INC.	SAMPLE I.D. #	: BLANK SPIKE
PROJECT #	: 0161-228-R04	DATE EXTRACTED	: 11/17/92
PROJECT NAME	: UNOCAL - CHELAN	DATE ANALYZED	: 11/18/92
EPA METHOD	: 8020 (BETX)	UNITS	: mg/Kg
SAMPLE MATRIX	: SOIL		

COMPOUND	SAMPLE RESULT	SPIKE ADDED	SPIKED RESULT	% REC.	DUP. SPIKED RESULT	DUP. % REC.	RPD
BENZENE	<0.025	1.00	0.893	89	0.863	86	3
TOLUENE	<0.025	1.00	0.966	97	0.940	94	3
TOTAL XYLENES	<0.025	2.00	1.90	95	1.80	90	5

CONTROL LIMITS	% REC.	RPD
BENZENE	63 - 115	20
TOLUENE	75 - 110	20
TOTAL XYLENES	79 - 109	20

SURROGATE RECOVERIES	SPIKE	DUP. SPIKE	LIMITS
BROMOFLUOROBENZENE	107	100	52 - 116

Analytical Technologies, Inc.

ATI I.D. # 9211-167

TOTAL PETROLEUM HYDROCARBON ANALYSIS
DATA SUMMARY

CLIENT	: GEOENGINEERS, INC.	DATE SAMPLED	: N/A
PROJECT #	: 0161-228-R04	DATE RECEIVED	: N/A
PROJECT NAME	: UNOCAL - CHELAN	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	RESULT
FUEL HYDROCARBONS	<5
HYDROCARBON RANGE	TOLUENE TO DODECANE
HYDROCARBON QUANTITATION USING	GASOLINE

SURROGATE PERCENT RECOVERY		LIMITS
TRIFLUOROTOLUENE	98	50 - 150

Analytical Technologies, Inc.

ATI I.D. # 9211-167-1

TOTAL PETROLEUM HYDROCARBON ANALYSIS
DATA SUMMARY

CLIENT	: GEOENGINEERS, INC.	DATE SAMPLED	: 11/14/92
PROJECT #	: 0161-228-R04	DATE RECEIVED	: 11/16/92
PROJECT NAME	: UNOCAL - CHELAN	DATE EXTRACTED	: 11/17/92
CLIENT I.D.	: MW-7-10	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	RESULT
FUEL HYDROCARBONS	<6
HYDROCARBON RANGE	TOLUENE TO DODECANE
HYDROCARBON QUANTITATION USING	GASOLINE

SURROGATE PERCENT RECOVERY		LIMITS
TRIFLUOROTOLUENE	70	50 - 150

Analytical Technologies, Inc.

ATI I.D. # 9211-167-2

TOTAL PETROLEUM HYDROCARBON ANALYSIS
DATA SUMMARY

CLIENT	: GEOENGINEERS, INC.	DATE SAMPLED	: 11/14/92
PROJECT #	: 0161-228-R04	DATE RECEIVED	: 11/16/92
PROJECT NAME	: UNOCAL - CHELAN	DATE EXTRACTED	: 11/17/92
CLIENT I.D.	: MW-7-11	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	RESULT
FUEL HYDROCARBONS	<6
HYDROCARBON RANGE	TOLUENE TO DODECANE
HYDROCARBON QUANTITATION USING	GASOLINE

SURROGATE PERCENT RECOVERY		LIMITS
TRIFLUOROTOLUENE	70	50 - 150

Analytical Technologies, Inc.

ATI I.D. # 9211-167-3

TOTAL PETROLEUM HYDROCARBON ANALYSIS
DATA SUMMARY

CLIENT	: GEOENGINEERS, INC.	DATE SAMPLED	: 11/14/92
PROJECT #	: 0161-228-R04	DATE RECEIVED	: 11/16/92
PROJECT NAME	: UNOCAL - CHELAN	DATE EXTRACTED	: 11/19/92
CLIENT I.D.	: S-1	DATE ANALYZED	: 11/20/92
SAMPLE MATRIX	: SOIL	UNITS	: mg/Kg
METHOD	: WA DOE WTPH-D	DILUTION FACTOR	: 1

RESULTS ARE CORRECTED FOR MOISTURE CONTENT

COMPOUND	RESULT
FUEL HYDROCARBONS	1,800
HYDROCARBON RANGE	C12 - C24
HYDROCARBON QUANTITATION USING	DIESEL

SURROGATE PERCENT RECOVERY		LIMITS
O-TERPHENYL	109	50 - 150

Analytical Technologies, Inc.

ATI I.D. # 9211-167

TOTAL PETROLEUM HYDROCARBONS ANALYSIS
CONTINUING CALIBRATION STANDARDS SUMMARY

CLIENT	: GEOENGINEERS, INC.	DATE SAMPLED	: N/A
PROJECT #	: 0161-228-R04	DATE RECEIVED	: N/A
PROJECT NAME	: UNOCAL - CHELAN	DATE EXTRACTED	: N/A
CLIENT I.D.	: 500 PPM CCV	DATE ANALYZED	: 11/19/92
SAMPLE MATRIX	: WATER	UNITS	: %
METHOD	: WA DOE WTPH-D	DILUTION FACTOR	: 1

COMPOUND	% DIFFERENCE
FUEL HYDROCARBONS QUANTITATED USING DIESEL	2

Analytical Technologies, Inc.

ATI I.D. # 9211-167

TOTAL PETROLEUM HYDROCARBON ANALYSIS
QUALITY CONTROL DATA

CLIENT	: GEOENGINEERS, INC.	SAMPLE I.D. #	: 9211-129-6
PROJECT #	: 0161-228-R04	DATE EXTRACTED	: 11/19/92
PROJECT NAME	: UNOCAL - CHELAN	DATE ANALYZED	: 11/19/92
METHOD	: WA DOE WTPH-D	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 (DIESEL)	<25	<25	NC	200	195	98	197	99	1

	CONTROL LIMITS	% REC.	RPD
DIESEL	63 - 131	20	

	SURROGATE RECOVERIES	SPIKE	DUP. SPIKE	LIMITS
O-TERPHENYL	96	109	50 - 150	

NC = Not Calculable.

Analytical Technologies, Inc.

ATI I.D. # 9211-167

TOTAL PETROLEUM HYDROCARBON ANALYSIS
QUALITY CONTROL DATA

CLIENT	: GEOENGINEERS, INC.	SAMPLE I.D. #	: BLANK SPIKE
PROJECT #	: 0161-228-R04	DATE EXTRACTED	: 11/19/92
PROJECT NAME	: UNOCAL - CHELAN	DATE ANALYZED	: 11/19/92
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
PETROLEUM HYDROCARBONS (DIESEL)	<25	200	197	99	207	103	5

CONTROL LIMITS	% REC.	RPD
DIESEL	69 - 122	20

SURROGATE RECOVERIES	SPIKE	DUP. SPIKE	LIMITS
O-TERPHENYL	97	96	50 - 150

AnalyticalTechnologies,Inc.

ATI I.D. # 9211-167

GENERAL CHEMISTRY ANALYSIS

CLIENT : GEOENGINEERS, INC. MATRIX : SOIL
PROJECT # : 0161-228-R04
PROJECT NAME : UNOCAL - CHELAN

PARAMETER	DATE ANALYZED
MOISTURE	11/18/92

AnalyticalTechnologies,Inc.

ATI I.D. # 9211-167

GENERAL CHEMISTRY ANALYSIS
DATA SUMMARY

CLIENT : GEOENGINEERS, INC. MATRIX : SOIL
PROJECT # : 0161-228-R04
PROJECT NAME : UNOCAL - CHELAN UNITS : %

ATI I.D. #	CLIENT I.D.	MOISTURE
9211-167-1	MW-7-10	23
9211-167-2	MW-7-11	21
9211-167-3	S-1	8.8

AnalyticalTechnologies,Inc.

ATI I.D. # 9211-167

GENERAL CHEMISTRY ANALYSIS
QUALITY CONTROL DATA

CLIENT : GEOENGINEERS, INC. MATRIX : SOIL
PROJECT # : 0161-228-R04
PROJECT NAME : UNOCAL - CHELAN UNITS : %

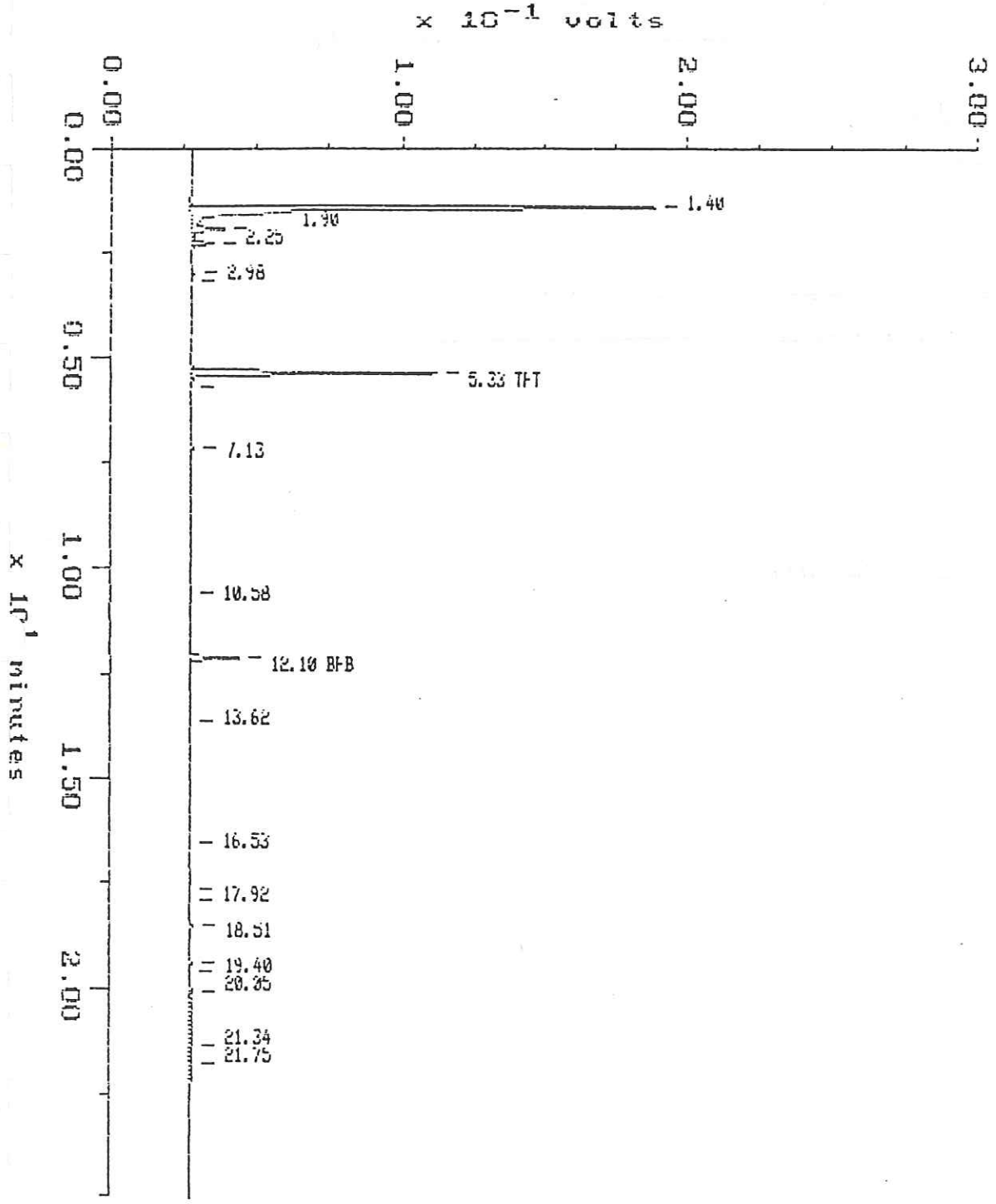
PARAMETER	ATI I.D.	SAMPLE RESULT	DUP RESULT	RPD	SPIKED RESULT	SPIKE ADDED	% REC
MOISTURE	9211-167-1	23	22	4	N/A	N/A	N/A

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

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

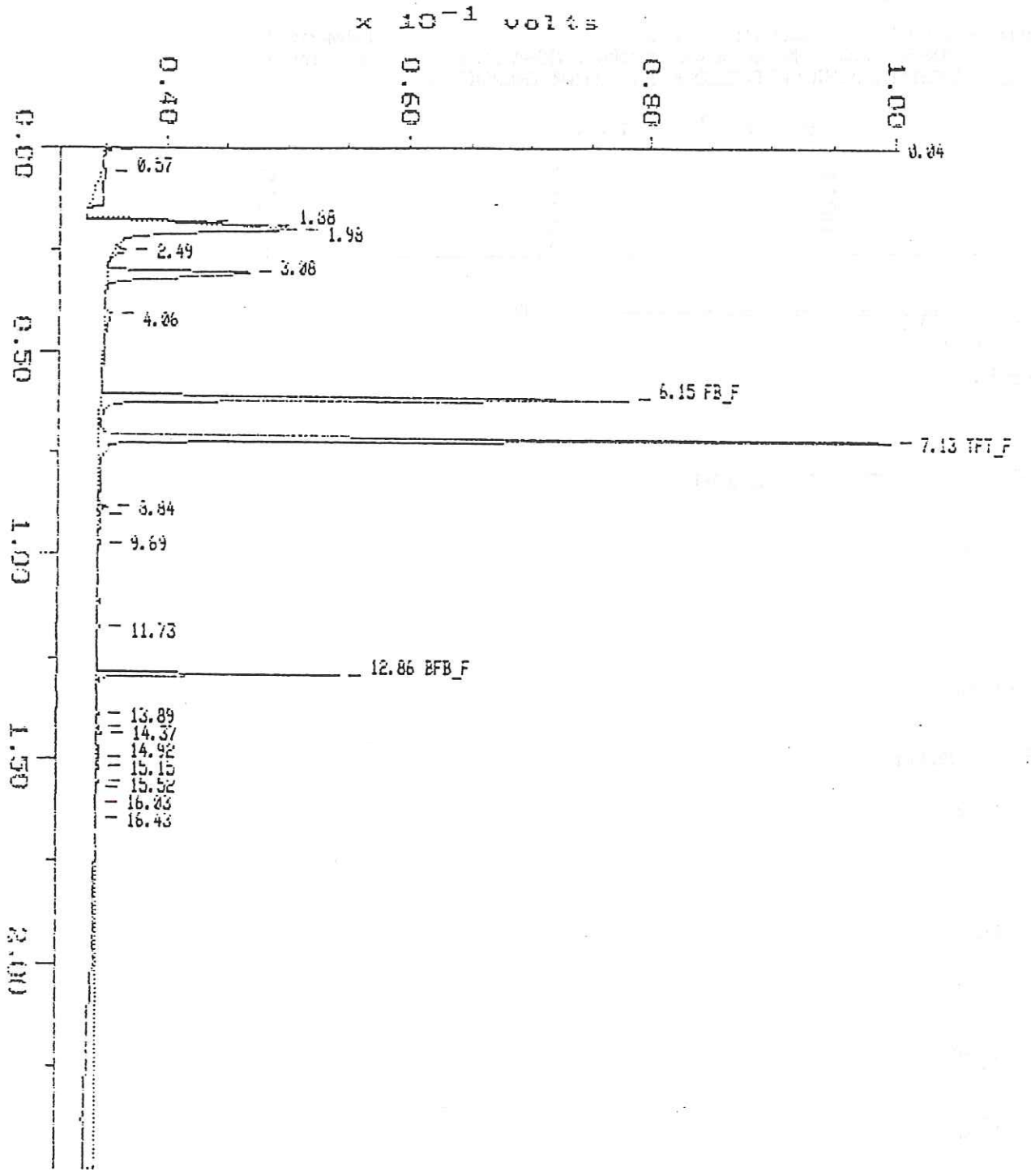
WA DOE WTPH-G

Sample: 9211-167-1 Channel: PRISCILLA Filename: 111/EP11
Acquired: 18-NOV-92 2:03 Method: H:\BR02\MAXDATA\ELVIS-P\111792EP Operator: ATI
Comments: ATI FUELS: A MISSION OF EXCELLENCE IN ANALYTICAL CHROMATOGRAPHY.



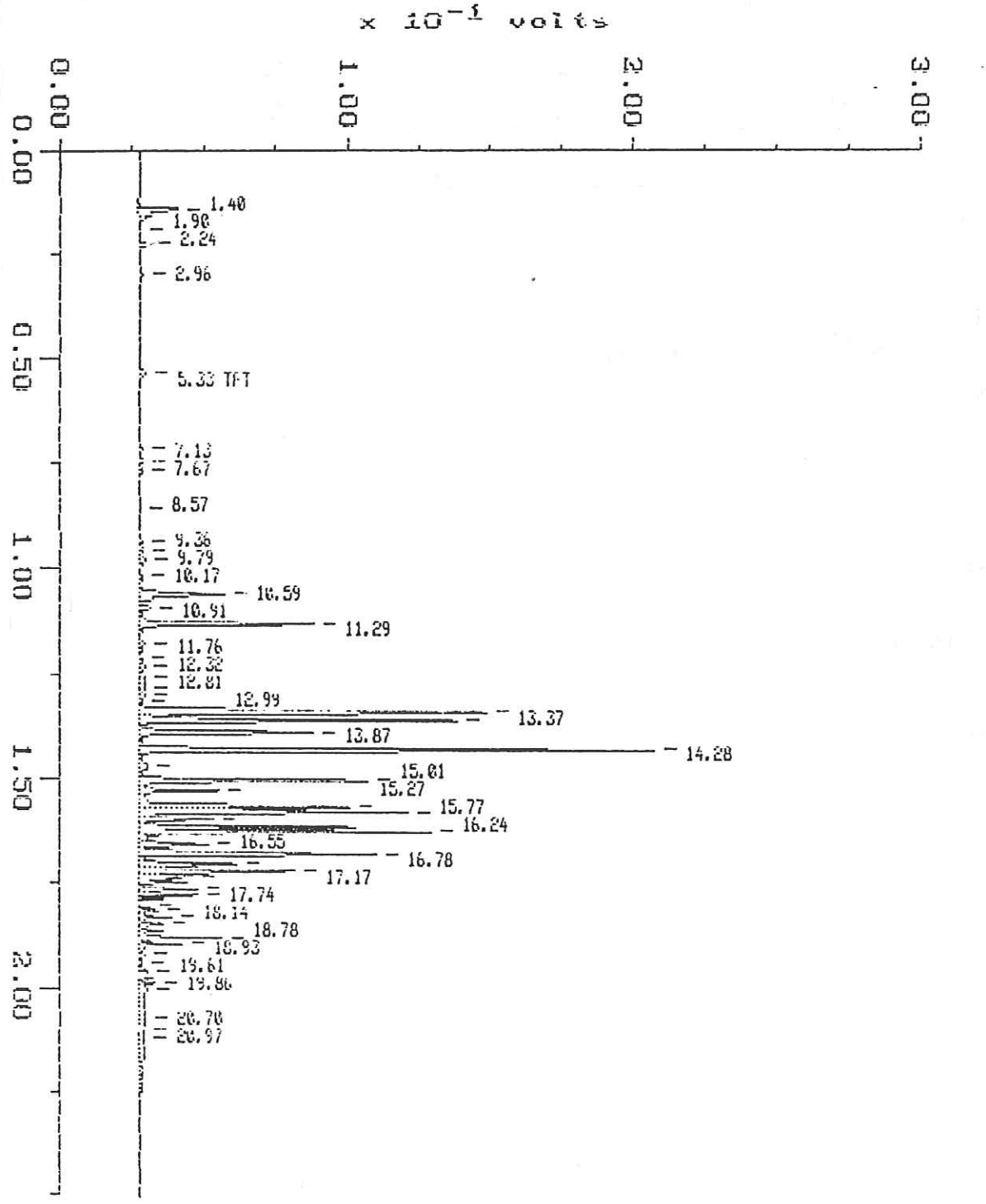
WA DOE WTPH-G

Sample: 9211-167-2 Channel: JEROME-FID Filename: 1118JR13
Acquired: 18-NOV-92 17:32 Method: A:\BRU2\MAXDATA\JEROME\J1118928 Operator:



WA DOE WTPH-G

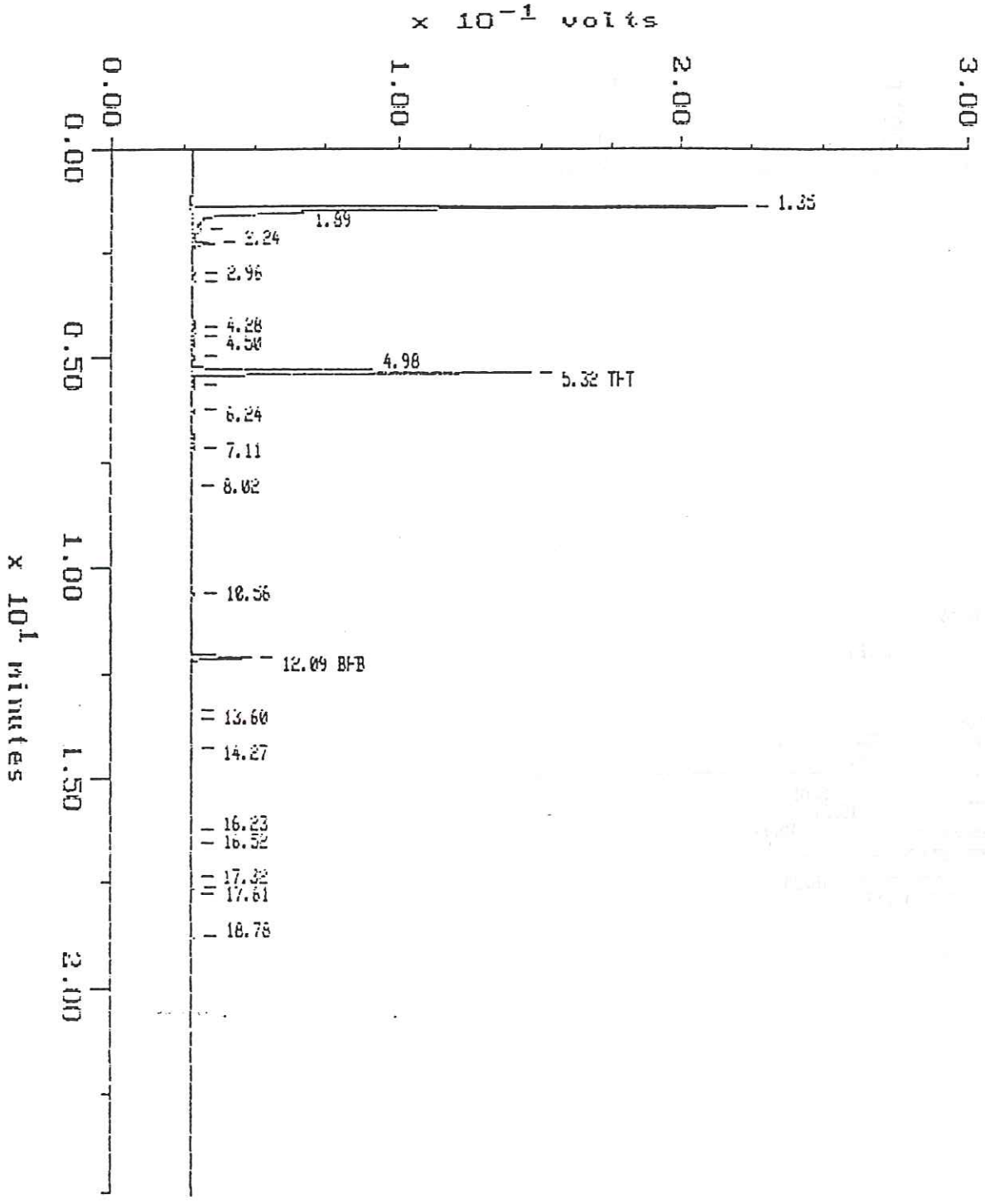
Sample: 9211-167-3 DIL Channel: PRISCILLA Filename: 1110EP12
Acquired: 18-NOV-92 23:06 Method: H:\DRO2\MAXDATA\ELVIS-P\111892EP Operator: ATI
Dilution: 1 : 100.000
Comments: ATI FUELS: A MISSION OF EXCELLENCE IN ANALYTICAL CHROMATOGRAPHY.



WA DOE WTPH-G

Blank

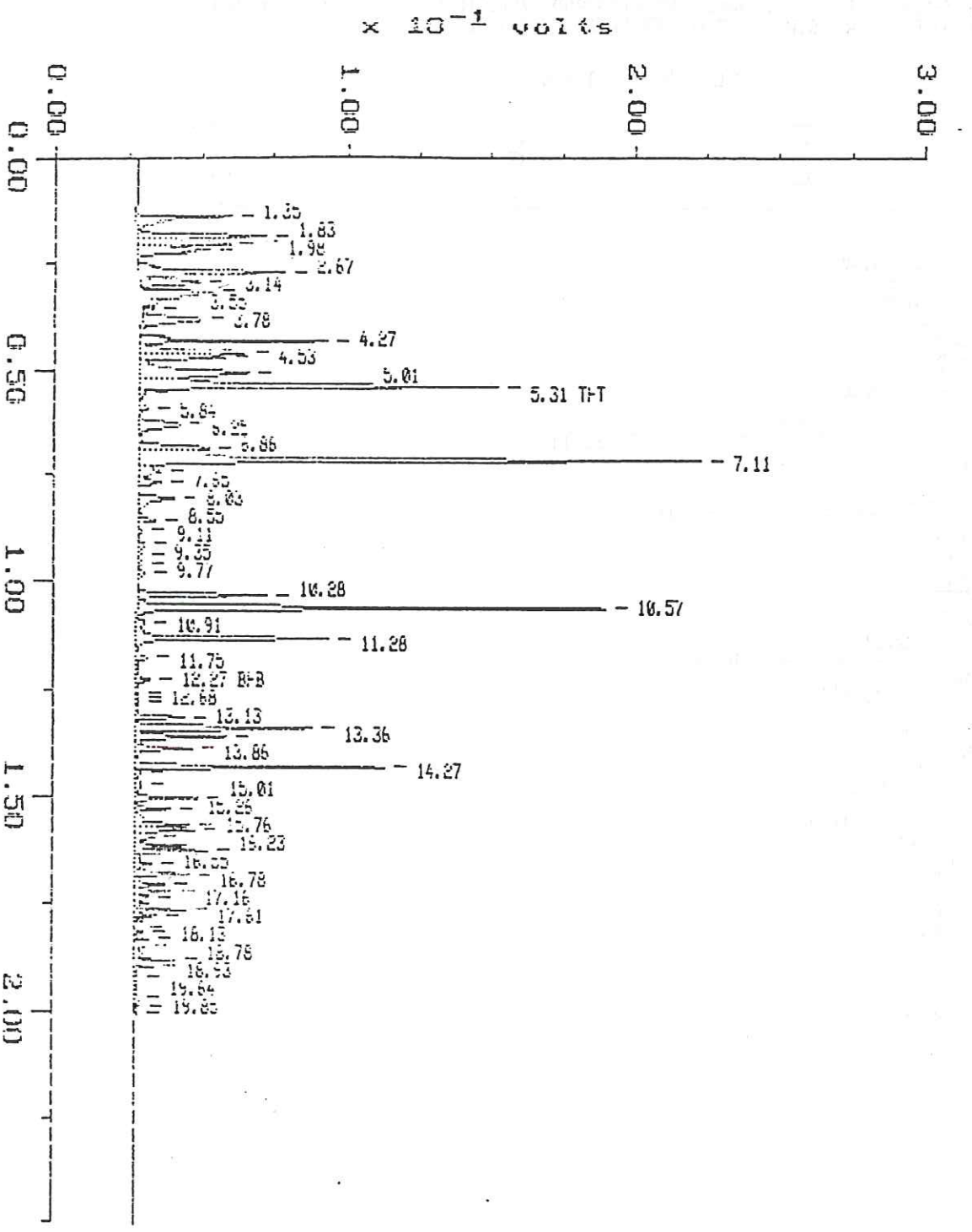
Sample: SKB-A 11/17 Channel: PRISCILLA Filename: 1117EP03
Acquired: 17-NOV-92 21:33 Method: H:\BRU2\MAXDATA\ELVIS-P\111792EP Operator: ATI
Comments: ATI FUELS: A MISSION OF EXCELLENCE IN ANALYTICAL CHROMATOGRAPHY.



WA DOE WTPH-G

Continuing Calibration

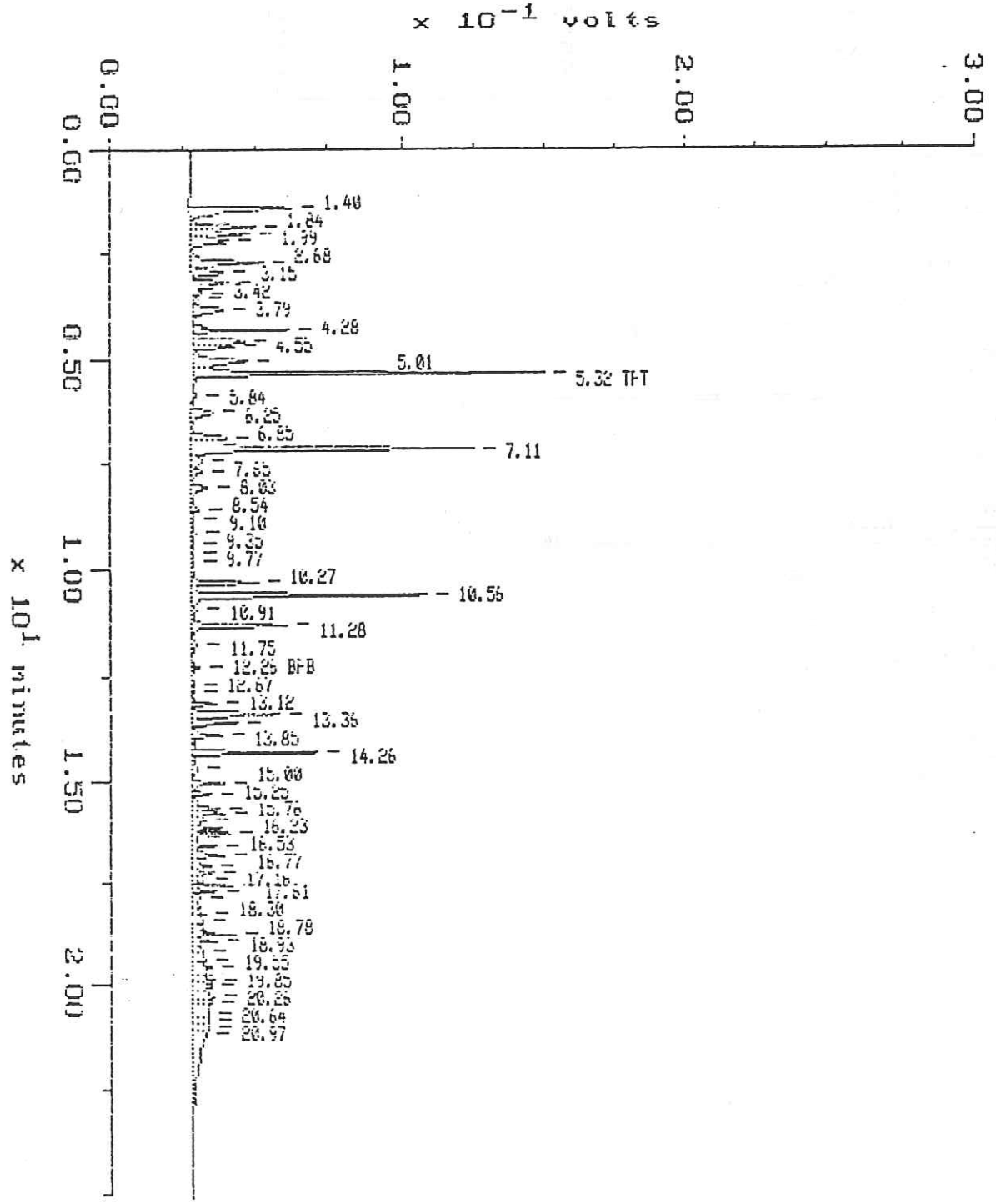
Sample: WMS 11/17 Channel: PRISCILLA Filename: 1117EP01
Acquired: 17-NOV-92 13:41 Method: H:\BRO2\MAXDATA\ELVIS-P\111792EP Operator: ATI
Comments: ATI FUELS: A MISSION OF EXCELLENCE IN ANALYTICAL CHROMATOGRAPHY.



WA DOE WTPH-G

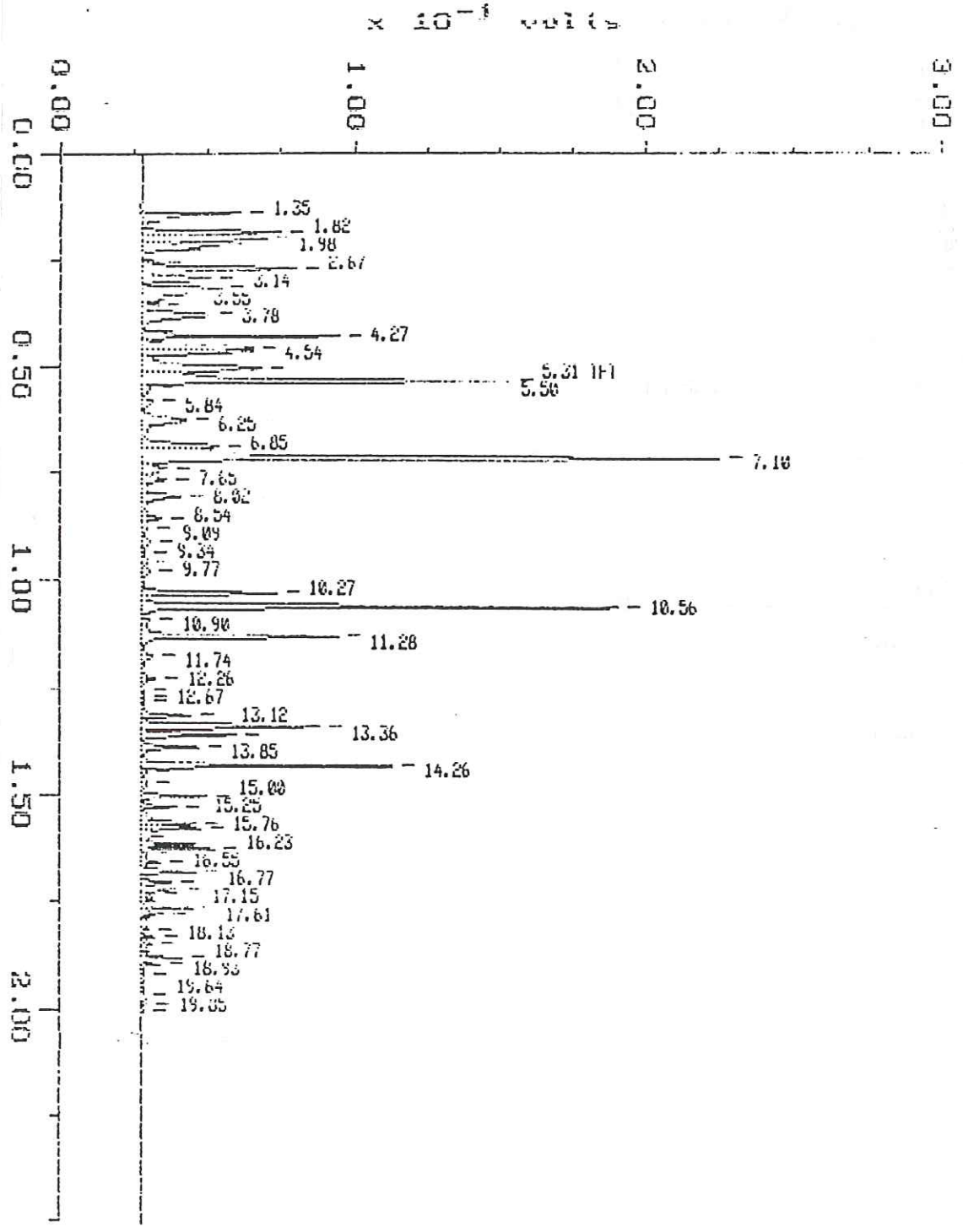
Continuing Calibration

Sample: std-c 1117 Channel: PRISCILLA Filename: 111/EP1/
Acquired: 18-NOV-92 10:25 Method: H:\BRU2\MAXDATA\ELVIS-P\111792EP Operator: ATI
Comments: ATI FUELS: A MISSION OF EXCELLENCE IN ANALYTICAL CHROMATOGRAPHY.



WA DOE WTPH-G Continuing Calibration

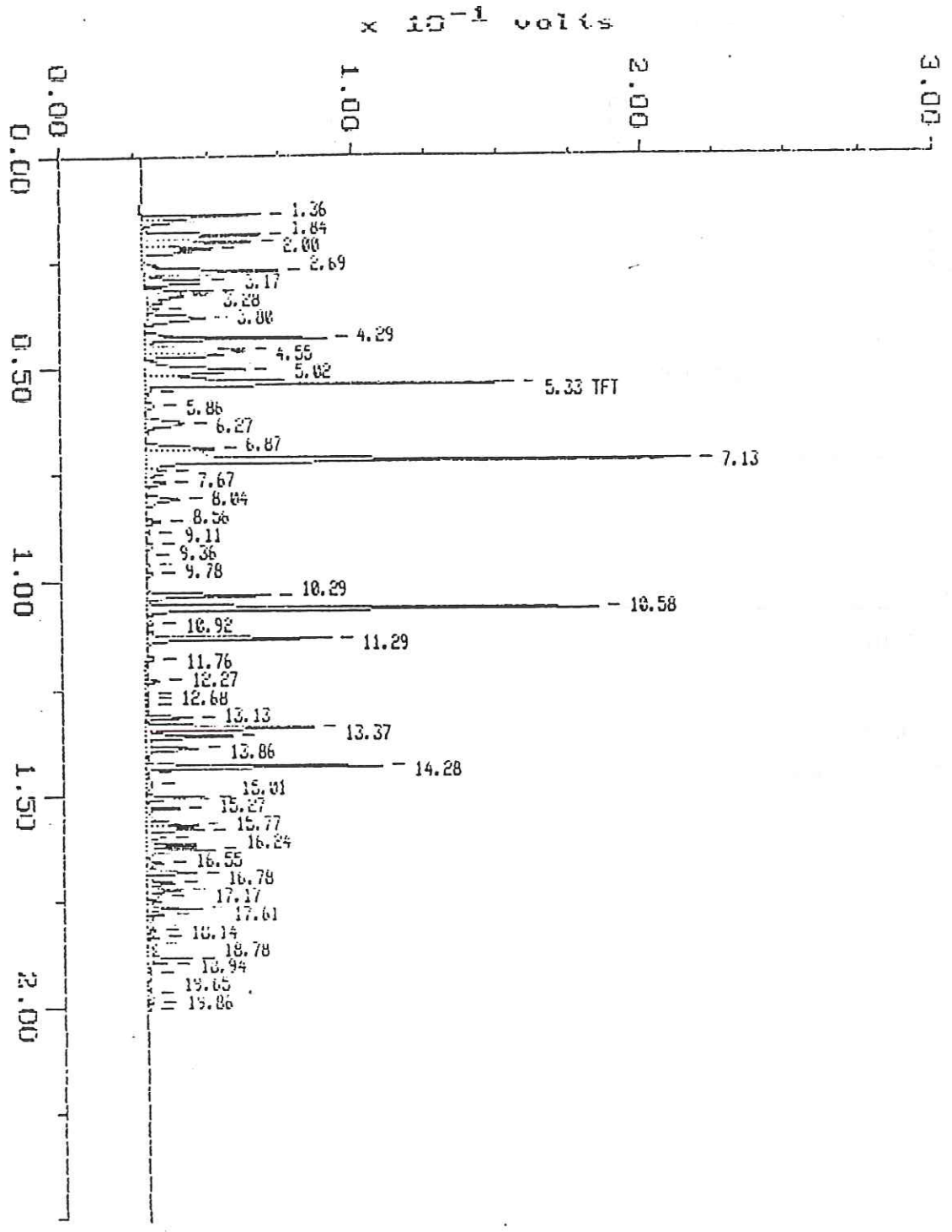
Sample: WMS 11/18 Channel: PRISCILLA Filename: 1118GPGI
Acquired: 18-NOV-92 13:00 Method: H:\DRO2\MAXDATA\ELVIS-P\1118926P Operator: ATI
Comments: ATI FUELS: A MISSION OF EXCELLENCE IN ANALYTICAL CHROMATOGRAPHY.



WA DOE WTPH-G

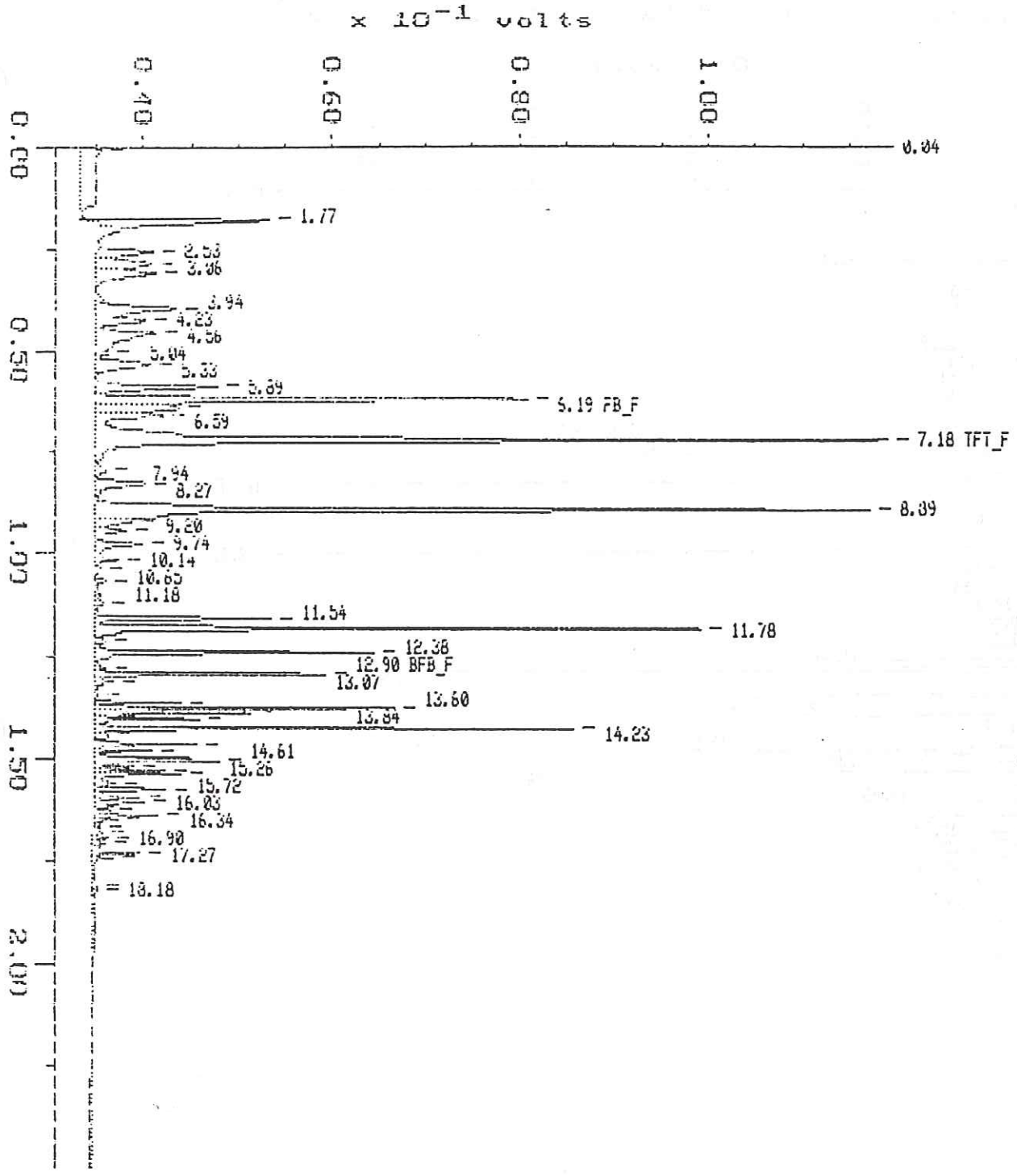
Continuing Calibration

Sample: C.C. 2 PPM Channel: PRISCILLA Filename: 1110EP18
Acquired: 19-NOV-92 2:29 Method: H:\BRG2\MAXDATA\ELVIS-P\11189EEP Operator: ATI
Comments: ATI FUELS: A MISSION OF EXCELLENCE IN ANALYTICAL CHROMATOGRAPHY.



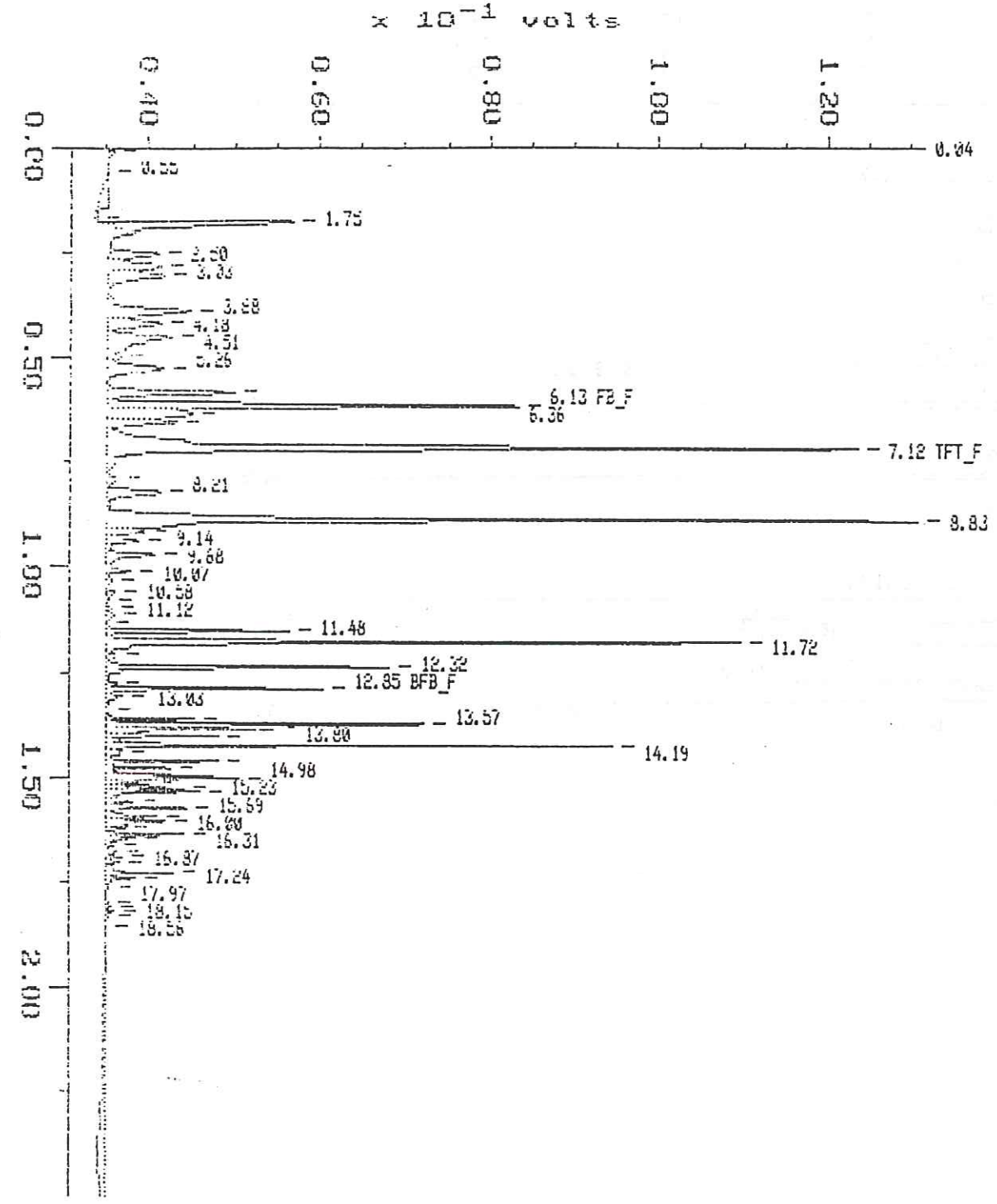
WA DOE WTPH-G Continuing Calibration

Sample: STD-C GAS Channel: JEROME-FID Filename: 1118JR02
Acquired: 18-NOV-92 11:45 Method: H:\BRU2\MAXDATA\JEROME\J1118928 Operator:

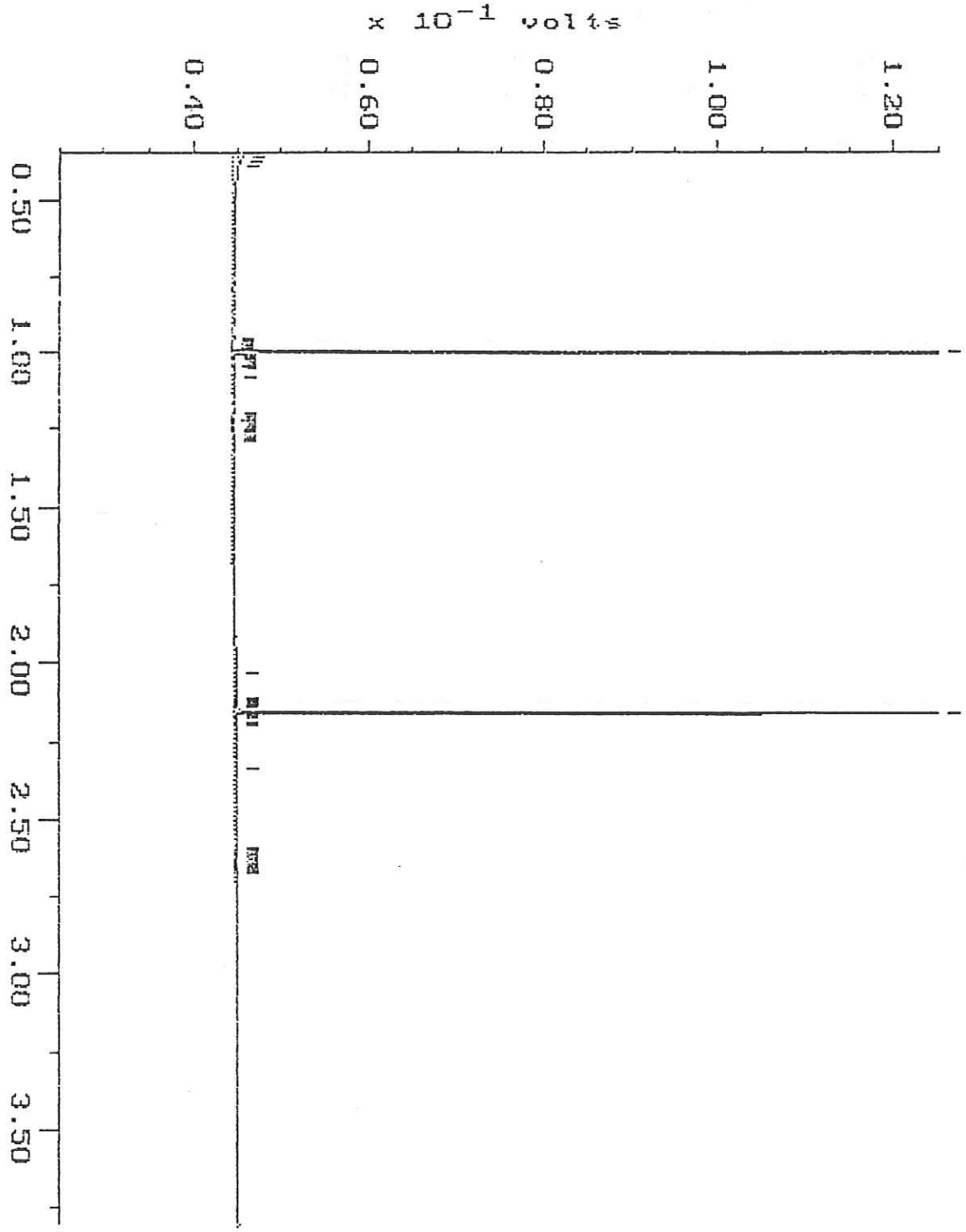


WA DOE WTPH-G Continuing Calibration

Sample: STD-C 11/18 Channel: JEROME-FID Filename: 1118JR34
Acquired: 19-NOV-92 3:45 Method: H:\2R02\MAXDATA\JEROME\J1118928 Operator:

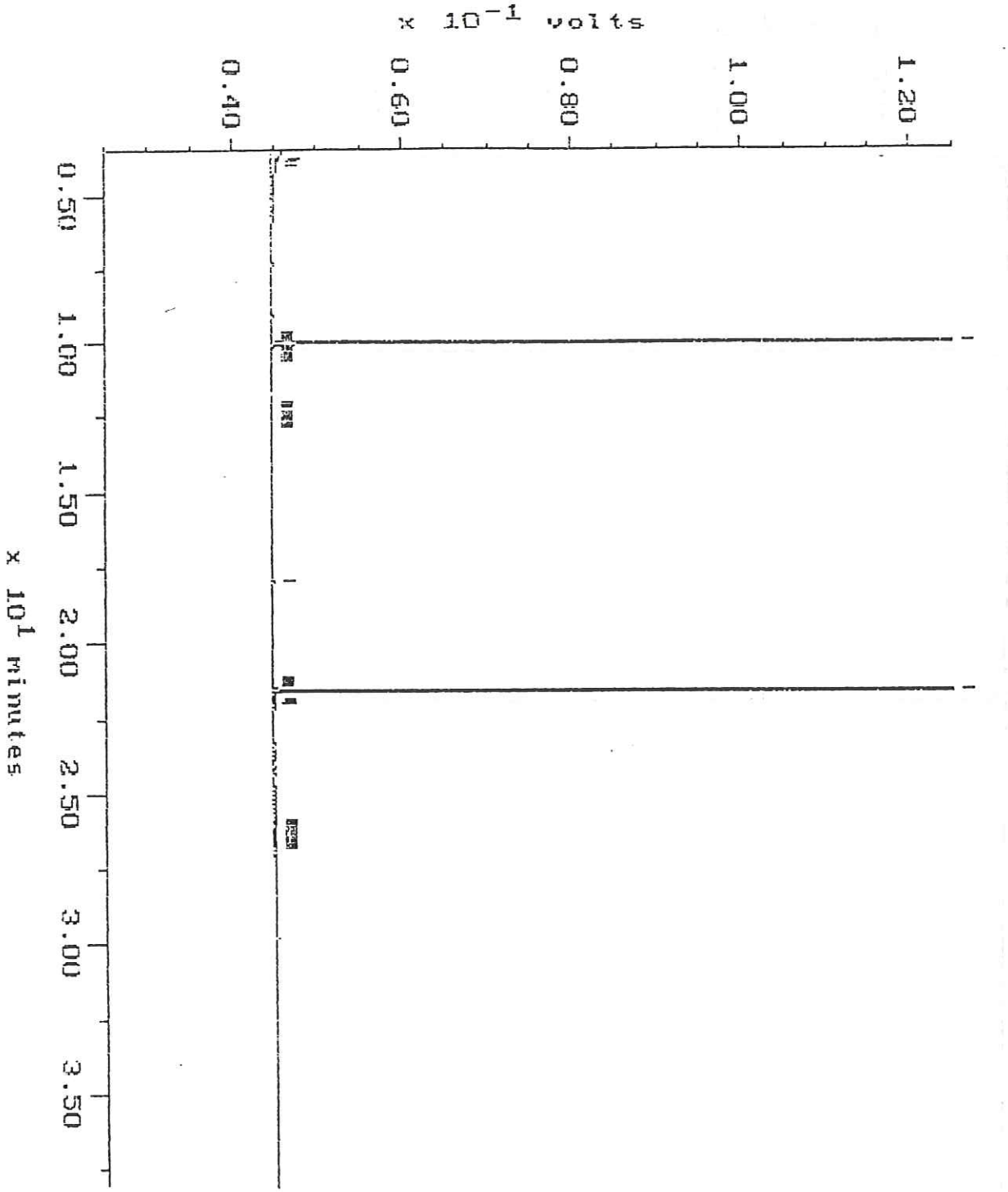


Sample: 9211-167-1 Channel: CLARENCE Filename: 1119SC12
Acquired: 20-NOV-92 1:18 Method: L:\BR02\MAXDATA\SERGE-C\FUEL1119 Operator: ATI
Comments: ATI RUSH FUELS: DEDICATED TO QUALITY CLIENT SERVICE



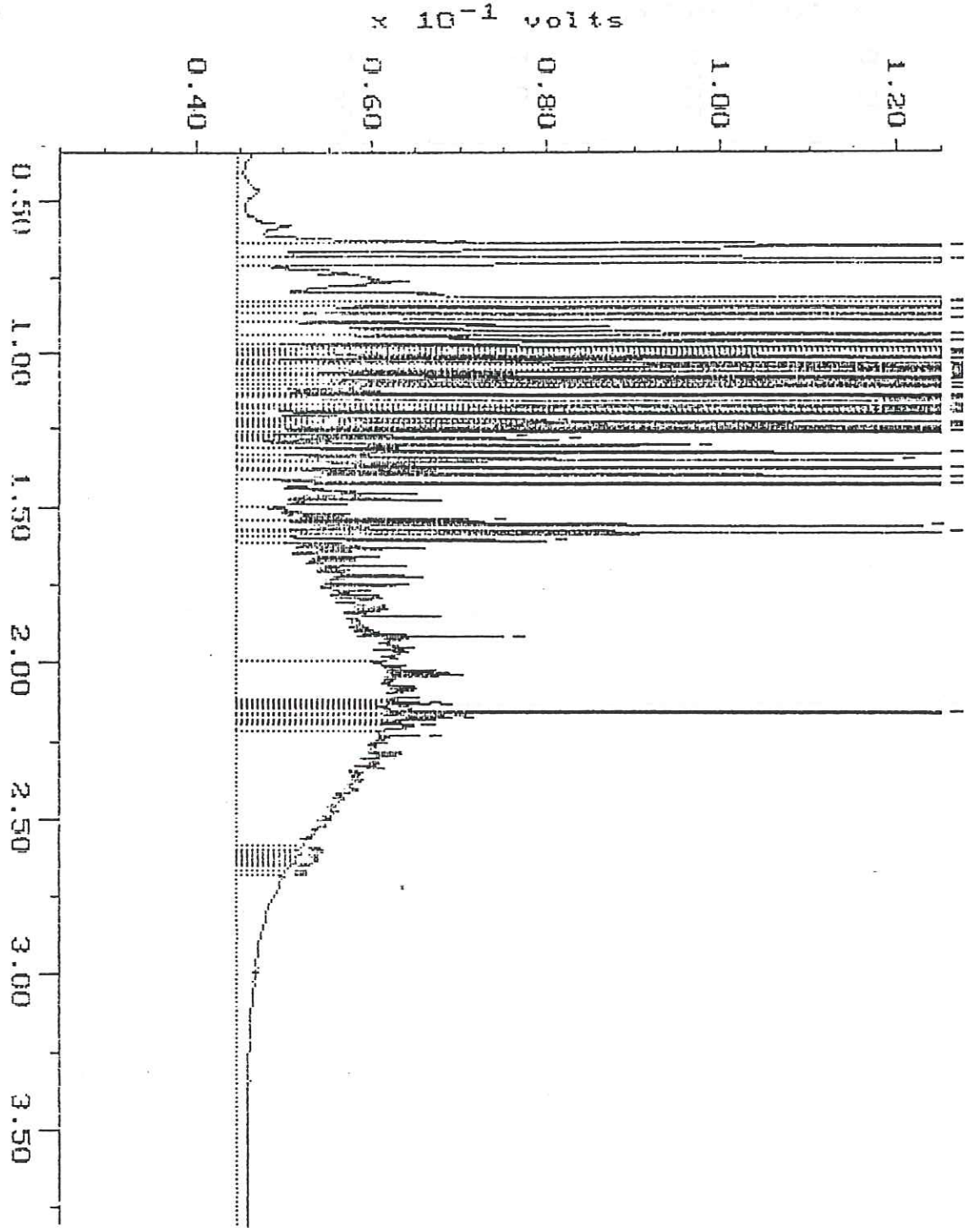
WA DOE WTPH-D

Sample: 9211-167-2 Channel: CLARENCE Filename: 1119SC14
Acquired: 20-NOV-92 2:49 Method: L:\BRC2\MAXDATA\SERGE-C\FUEL1119 Operator: ATI
Comments: ATI RUSH FUELS: DEDICATED TO QUALITY CLIENT SERVICE



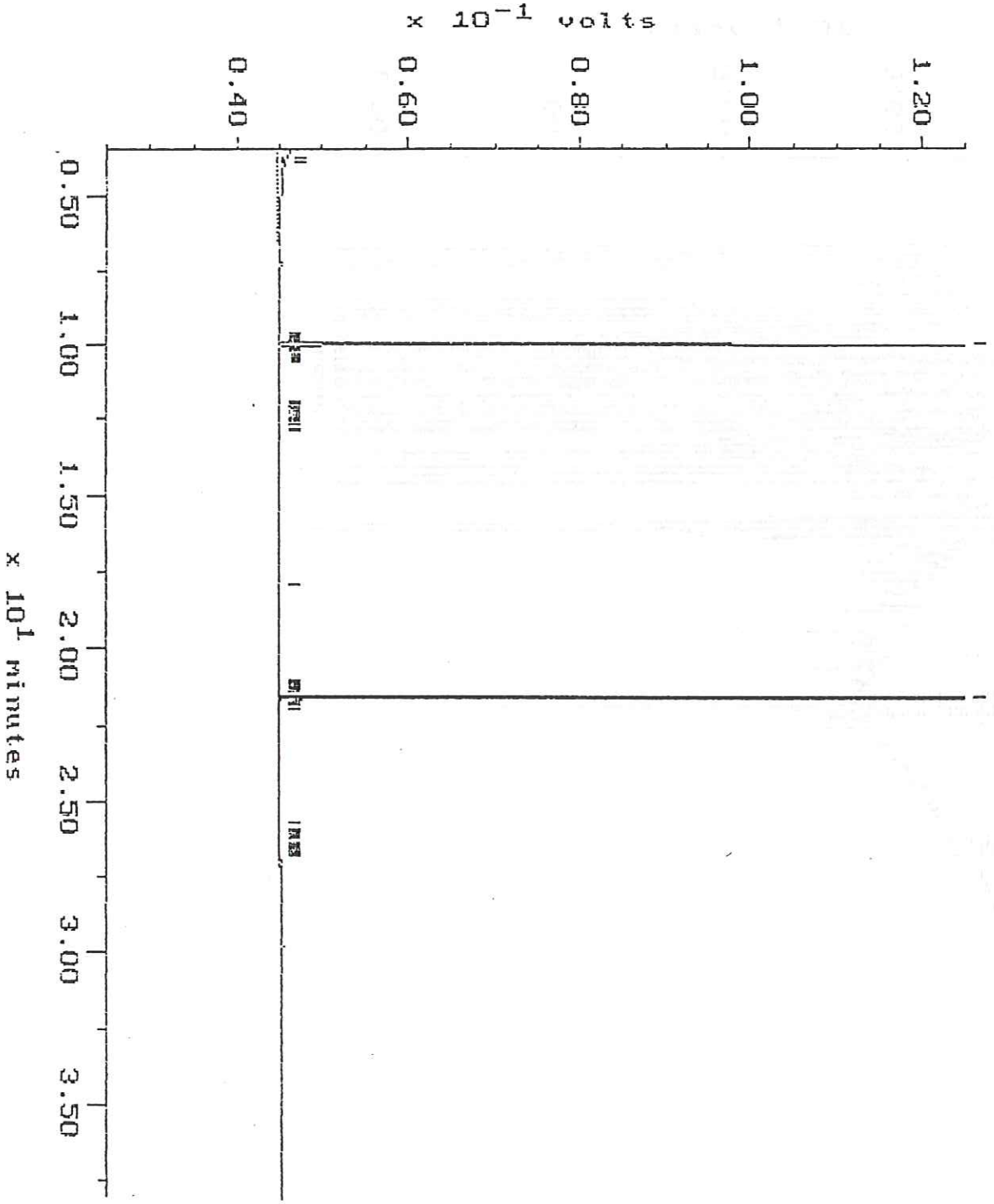
WA DOE WTPH-D

Sample: 9211-167-3 Channel: CLARENCE Filename: 1119SC15
Acquired: 20-NOV-92 3:35 Method: L:\BRO2\MAXDATA\SERGE-C\FUEL1119 Operator: ATI
Comments: ATI RUSH FUELS: DEDICATED TO QUALITY CLIENT SERVICE



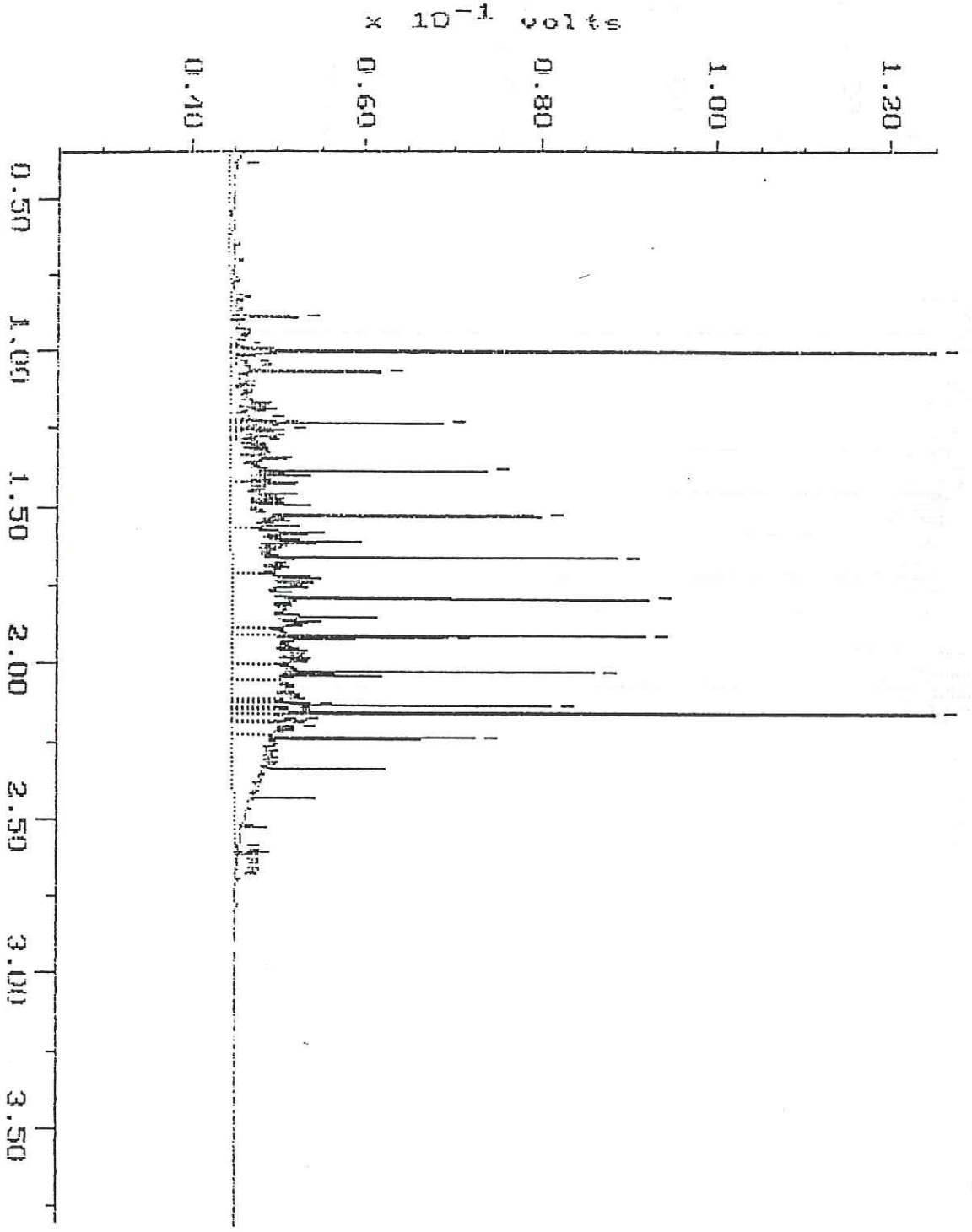
WA DOE WTPH-D

Sample: SRB11-19 Channel: CLARENCE Filename: 1119SC03
Acquired: 19-NOV-92 10:28 Method: L:\BRO2\MAXDATA\SERGE-C\FUEL1119 Operator: ATI
Comments: ATI RUSH FUELS: DEDICATED TO QUALITY CLIENT SERVICE



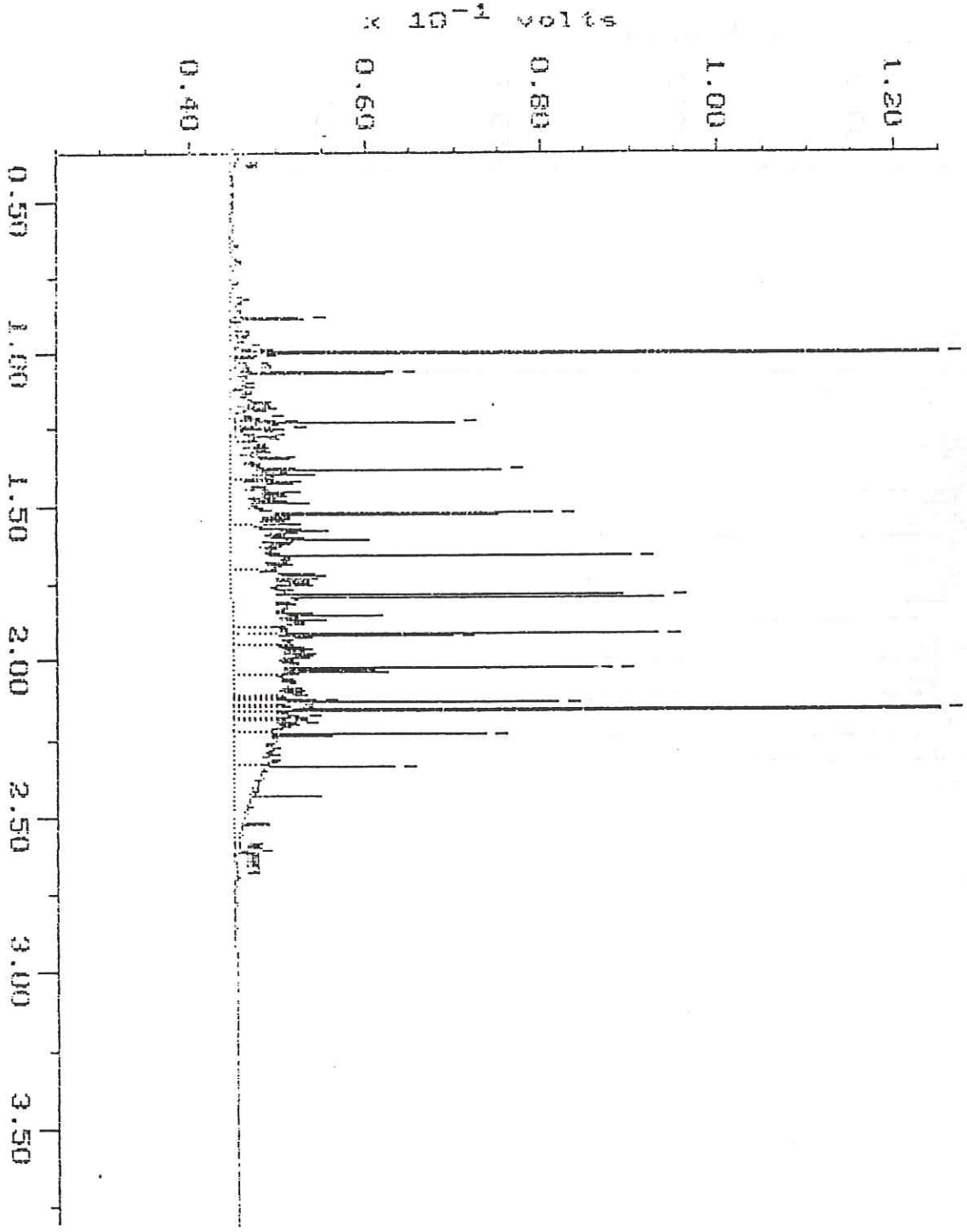
WA DOE WTPH-D

Sample: D E20 Channel: CLARENCE Filename: 1119SC02
Acquired: 19-NOV-92 17:42 Method: L:\BRC2\MAXDATA\SERGE-C\FUEL1119 Operator: ATI
Comments: ATI RUSH FUELS: DEDICATED TO QUALITY CLIENT SERVICE



WA DOE WTPH-D

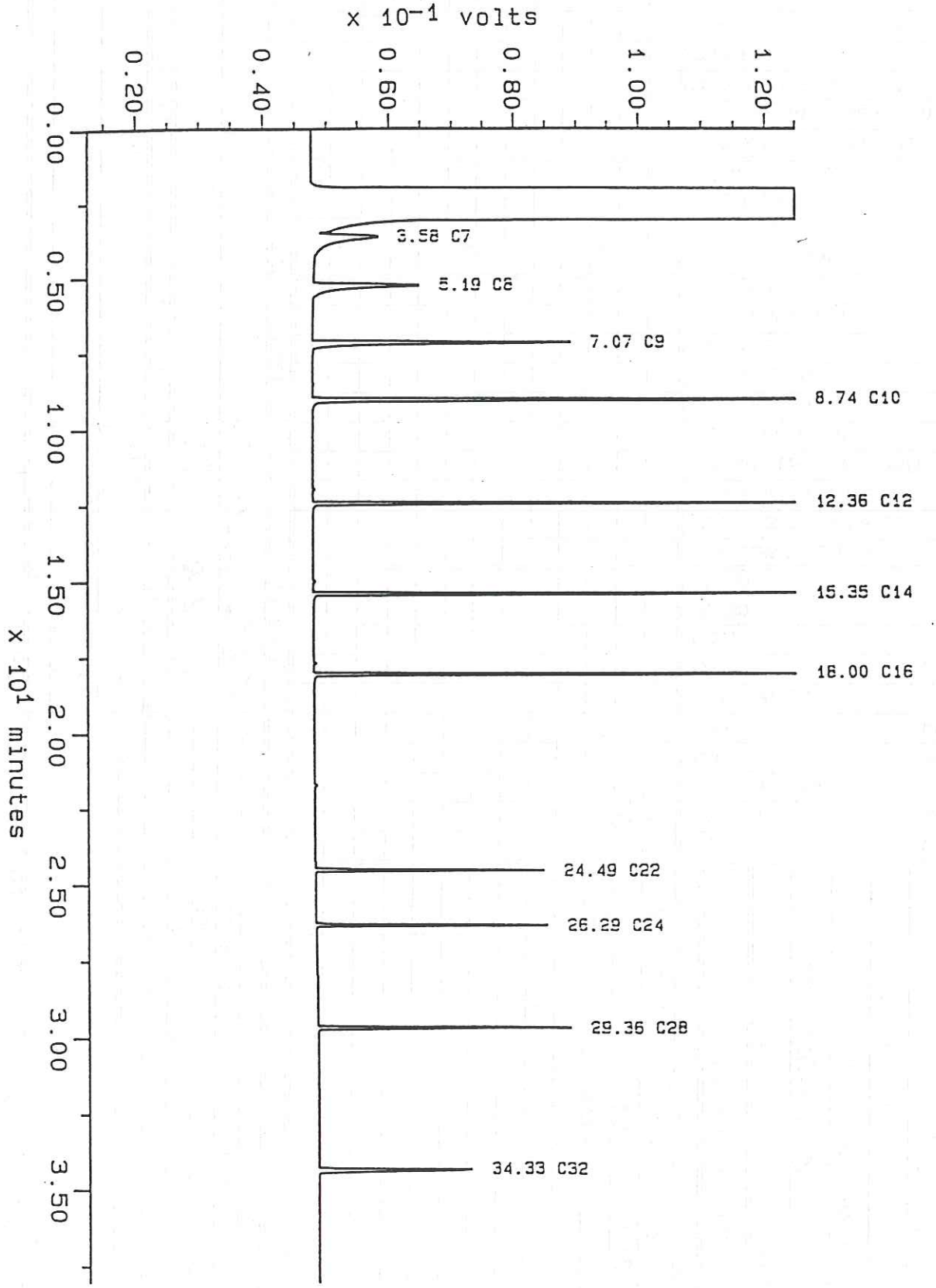
Sample: 2 500 Channel: CLARENCE Filename: 1119SC33
Acquired: 20-NOV-98 17:21 Method: L:\BRG2\MAXDATA\SERGE-C\FUEL1119 Operator: ATI
Comments: ATI HIGH FUELS: DEDICATED TO QUALITY CLIENT SERVICE



Sample: ALKANE
Acquired: CLOCK NOT SET
Inj Vol: 1.00

Channel: CLARENCE
Method: H: \BR02\MAXDATA\SERGE-C\FUEL100B

Filename: 1008SC40
Operator: ATI



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

DATE: 11/16/92 Page 1 of 1 ATI ACCESSION # 9211-167

COMPANY: GET
REPORT TO: Norm Puri
ADDRESS: 8410 154th Ave NE
Redmond
PHONE:( ) - FAX:( ) -
PROJECT MANAGER: Norm Puri
PROJECT NUMBER: 161-228-004 TO2.1
PROJECT NAME: Uboral, Chelan

ATI will DISPOSE / RETURN samples (circle one)

Sample ID	Date	Time	Matrix	LabID	FUELS: TPH-HCID WA/OR	BETX/TPH-G combo WA/OR	BETX (by 8020) WA/OR	TPH-G WA/OR	TPH-D WA/OR	8015 modified WA/OR	418.1 WA/OR	413.2	AK-GRO	AK-DRO	ORGANIC COMPOUNDS: 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: Metals (Indicate below *)	Total Lead	Priority Pollutant Metals (13)	TAL Metals (23)	TCLP: TCLP-Volatiles (ZHE-8240)	TCLP-Semivolatiles (8270)	TCLP-Pesticides (8080)	TCLP-Herbicides (8150)	TCLP-Metals (8 metals)	OTHER: % Moisture (please indicate)					Total # of Containers/sample
MW-7-10	11/14	1114	Soil	1		X			X																													1
MW-7-11	11/14	1114		2		X			X																													1
S-1	11/14	1114		3		X			X																													1

Turnaround Time		Sample Receipt	
STANDARD TAT	X	TOTAL # CONTAINERS RECVD	3
1 WEEK TAT		COC SEALS PRESENT?	Y
4 WORK DAY TAT		COC SEALS INTACT?	Y
3 WORK DAY TAT		RECEIVED COLD?	Y
2 WORK DAY TAT		RECEIVED INTACT?	Y
24 HOUR TAT		RECEIVED VIA:	

Special Instructions:

* Metals needed:

Relinquished By:	Relinquished By:	Relinquished By:
Date: 11/16	Date:	Date:
Time: 1020	Time:	Time:
Received By:	Received By:	Received By:
Date:	Date:	Date:
Time:	Time:	Time:

Corporate Offices: 5550 Morehouse Drive, San Diego, CA 92121 (619)458-9141

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. # 9211-166

December 7, 1992

GeoEngineers
DEC 0 9 1992
Routing A/LP
File

eoEngineers, Inc.
410 154th Ave. N.E.
Redmond, WA 98052

Attention : Norm Puri

roject Number : 0161-228-R04 Task 1.1

Project Name : Unocal - Chelan

n November 16, 1992, Analytical Technologies, Inc., received eight samples for analysis. The samples were analyzed with EPA methodology r equivalent methods as specified in the attached analytical schedule. he results, sample cross reference, and quality control data are enclosed.

Donna M. McKinney

onna M. McKinney
enior Project Manager

M/hal/rmn

Corporate Offices: 5550 Morehouse Drive San Diego, CA 92121 (619) 458-9141

Analytical Technologies, Inc.

ATI I.D. # 9211-166

SAMPLE CROSS REFERENCE SHEET

CLIENT : GEOENGINEERS, INC.
PROJECT # : 0161-228-R04
PROJECT NAME : UNOCAL - CHELAN

ATI #	CLIENT DESCRIPTION	DATE SAMPLED	MATRIX
9211-166-1	DRUM	11/13/92	WATER
9211-166-2	MW-1	11/12/92	WATER
9211-166-3	MW-2	11/12/92	WATER
9211-166-4	MW-3	11/12/92	WATER
9211-166-5	MW-5	11/12/92	WATER
9211-166-6	MW-6	11/12/92	WATER
9211-166-7	MW-7	11/15/92	WATER
9211-166-8	DUP	11/12/92	WATER

----- TOTALS -----

MATRIX	# SAMPLES
WATER	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.

Analytical Technologies, Inc.

ATI I.D. # 9211-166

ANALYTICAL SCHEDULE

LIENT : GEOENGINEERS, INC.
ROJECT # : 0161-228-R04
PROJECT NAME : UNOCAL - CHELAN

ANALYSIS	TECHNIQUE	REFERENCE	LAB
ETX	GC/PID	EPA 8020	R
TOTAL PETROLEUM HYDROCARBONS	GC/FID	WA DOE WTPH-G	R
TOTAL PETROLEUM HYDROCARBONS	GC/FID	WA DOE WTPH-D	R
IL & GREASE	IR	EPA 413.2	R
LEAD	AA/GF	EPA 7421	R

R = ATI - Renton
SD = ATI - San Diego
HX = ATI - Phoenix
NR = ATI - Pensacola
= ATI - Fort Collins
B = Subcontract

Analytical Technologies, Inc.

ATI I.D. # 9211-166

VOLATILE ORGANIC ANALYSIS
DATA SUMMARY

CLIENT	: GEOENGINEERS, INC.	DATE SAMPLED	: N/A
PROJECT #	: 0161-228-R04	DATE RECEIVED	: N/A
PROJECT NAME	: UNOCAL - CHELAN	DATE EXTRACTED	: N/A
CLIENT I.D.	: METHOD BLANK	DATE ANALYZED	: 11/16/92
SAMPLE MATRIX	: WATER	UNITS	: ug/L
EPA METHOD	: 8020 (BETX)	DILUTION FACTOR	: 1

COMPOUND	RESULT
BENZENE	<0.5
ETHYLBENZENE	<0.5
TOLUENE	<0.5
TOTAL XYLENES	<0.5

SURROGATE PERCENT RECOVERY		LIMITS
BROMOFLUOROBENZENE	95	76 - 120

Analytical Technologies, Inc.

ATI I.D. # 9211-166

VOLATILE ORGANIC ANALYSIS
DATA SUMMARY

CLIENT	: GEOENGINEERS, INC.	DATE SAMPLED	: N/A
PROJECT #	: 0161-228-R04	DATE RECEIVED	: N/A
PROJECT NAME	: UNOCAL - CHELAN	DATE EXTRACTED	: N/A
CLIENT I.D.	: METHOD BLANK	DATE ANALYZED	: 11/16/92
SAMPLE MATRIX	: WATER	UNITS	: ug/L
EPA METHOD	: 8020 (BETX)	DILUTION FACTOR	: 1

COMPOUND	RESULT
BENZENE	<0.5
ETHYLBENZENE	<0.5
TOLUENE	<0.5
TOTAL XYLENES	<0.5

SURROGATE PERCENT RECOVERY		LIMITS
BROMOFLUOROBENZENE	99	76 - 120

Analytical Technologies, Inc.

ATI I.D. # 9211-166

VOLATILE ORGANIC ANALYSIS
DATA SUMMARY

CLIENT	: GEOENGINEERS, INC.	DATE SAMPLED	: N/A
PROJECT #	: 0161-228-R04	DATE RECEIVED	: N/A
PROJECT NAME	: UNOCAL - CHELAN	DATE EXTRACTED	: N/A
CLIENT I.D.	: METHOD BLANK	DATE ANALYZED	: 11/17/92
SAMPLE MATRIX	: WATER	UNITS	: ug/L
EPA METHOD	: 8020 (BETX)	DILUTION FACTOR	: 1

COMPOUND	RESULT
BENZENE	<0.5
ETHYLBENZENE	<0.5
TOLUENE	<0.5
TOTAL XYLENES	<0.5

SURROGATE PERCENT RECOVERY		LIMITS
BROMOFLUOROBENZENE	96	76 - 120

Analytical Technologies, Inc.

ATI I.D. # 9211-166-1

VOLATILE ORGANIC ANALYSIS
DATA SUMMARY

CLIENT	: GEOENGINEERS, INC.	DATE SAMPLED	: 11/13/92
PROJECT #	: 0161-228-R04	DATE RECEIVED	: 11/16/92
PROJECT NAME	: UNOCAL - CHELAN	DATE EXTRACTED	: N/A
CLIENT I.D.	: DRUM	DATE ANALYZED	: 11/17/92
SAMPLE MATRIX	: WATER	UNITS	: ug/L
EPA METHOD	: 8020 (BETX)	DILUTION FACTOR	: 1

COMPOUND	RESULT
BENZENE	11
ETHYLBENZENE	3.7
TOLUENE	2.7
TOTAL XYLENES	18

SURROGATE PERCENT RECOVERY		LIMITS
BROMOFLUOROBENZENE	97	76 - 120

Analytical Technologies, Inc.

ATI I.D. # 9211-166-2

VOLATILE ORGANIC ANALYSIS
DATA SUMMARY

CLIENT	: GEOENGINEERS, INC.	DATE SAMPLED	: 11/12/92
PROJECT #	: 0161-228-R04	DATE RECEIVED	: 11/16/92
PROJECT NAME	: UNOCAL - CHELAN	DATE EXTRACTED	: N/A
CLIENT I.D.	: MW-1	DATE ANALYZED	: 11/16/92
SAMPLE MATRIX	: WATER	UNITS	: ug/L
EPA METHOD	: 8020 (BETX)	DILUTION FACTOR	: 1

COMPOUND	RESULT	
BENZENE	75	
ETHYLBENZENE	19	
TOLUENE	53	
TOTAL XYLENES	150	D

SURROGATE PERCENT RECOVERY		LIMITS
BROMOFLUOROBENZENE	97	76 - 120

D = Value from a five fold diluted analysis.

Analytical Technologies, Inc.

ATI I.D. # 9211-166-3

VOLATILE ORGANIC ANALYSIS
DATA SUMMARY

CLIENT	: GEOENGINEERS, INC.	DATE SAMPLED	: 11/12/92
PROJECT #	: 0161-228-R04	DATE RECEIVED	: 11/16/92
PROJECT NAME	: UNOCAL - CHELAN	DATE EXTRACTED	: N/A
CLIENT I.D.	: MW-2	DATE ANALYZED	: 11/16/92
SAMPLE MATRIX	: WATER	UNITS	: ug/L
EPA METHOD	: 8020 (BETX)	DILUTION FACTOR	: 1

COMPOUND	RESULT
BENZENE	<0.5
ETHYLBENZENE	<0.5
TOLUENE	<0.5
TOTAL XYLENES	<0.5

SURROGATE PERCENT RECOVERY		LIMITS
BROMOFLUOROBENZENE	95	76 - 120

Analytical Technologies, Inc.

ATI I.D. # 9211-166-4

VOLATILE ORGANIC ANALYSIS
DATA SUMMARY

CLIENT	: GEOENGINEERS, INC.	DATE SAMPLED	: 11/12/92
PROJECT #	: 0161-228-R04	DATE RECEIVED	: 11/16/92
PROJECT NAME	: UNOCAL - CHELAN	DATE EXTRACTED	: N/A
CLIENT I.D.	: MW-3	DATE ANALYZED	: 11/17/92
SAMPLE MATRIX	: WATER	UNITS	: ug/L
EPA METHOD	: 8020 (BETX)	DILUTION FACTOR	: 1

COMPOUND	RESULT
BENZENE	<0.5
ETHYLBENZENE	<0.5
TOLUENE	<0.5
TOTAL XYLENES	<0.5

SURROGATE PERCENT RECOVERY		LIMITS
BROMOFLUOROBENZENE	99	76 - 120

Analytical Technologies, Inc.

ATI I.D. # 9211-166-5

VOLATILE ORGANIC ANALYSIS
DATA SUMMARY

CLIENT	: GEOENGINEERS, INC.	DATE SAMPLED	: 11/12/92
PROJECT #	: 0161-228-R04	DATE RECEIVED	: 11/16/92
PROJECT NAME	: UNOCAL - CHELAN	DATE EXTRACTED	: N/A
CLIENT I.D.	: MW-5	DATE ANALYZED	: 11/16/92
SAMPLE MATRIX	: WATER	UNITS	: ug/L
EPA METHOD	: 8020 (BETX)	DILUTION FACTOR	: 1

COMPOUND	RESULT	
BENZENE	91	D
ETHYLBENZENE	<0.5	
TOLUENE	5.8	
TOTAL XYLENES	110	D

SURROGATE PERCENT RECOVERY		LIMITS
BROMOFLUOROBENZENE	99	76 - 120

D = Value from a five fold diluted analysis.

Analytical Technologies, Inc.

ATI I.D. # 9211-166-6

VOLATILE ORGANIC ANALYSIS
DATA SUMMARY

CLIENT	: GEOENGINEERS, INC.	DATE SAMPLED	: 11/12/92
PROJECT #	: 0161-228-R04	DATE RECEIVED	: 11/16/92
PROJECT NAME	: UNOCAL - CHELAN	DATE EXTRACTED	: N/A
CLIENT I.D.	: MW-6	DATE ANALYZED	: 11/17/92
SAMPLE MATRIX	: WATER	UNITS	: ug/L
EPA METHOD	: 8020 (BETX)	DILUTION FACTOR	: 1

COMPOUND	RESULT
BENZENE	<0.5
ETHYLBENZENE	<0.5
TOLUENE	<0.5
TOTAL XYLENES	<0.5

SURROGATE PERCENT RECOVERY		LIMITS
BROMOFLUOROBENZENE	95	76 - 120

Analytical Technologies, Inc.

ATI I.D. # 9211-166-7

VOLATILE ORGANIC ANALYSIS
DATA SUMMARY

CLIENT	: GEOENGINEERS, INC.	DATE SAMPLED	: 11/15/92
PROJECT #	: 0161-228-R04	DATE RECEIVED	: 11/16/92
PROJECT NAME	: UNOCAL - CHELAN	DATE EXTRACTED	: N/A
CLIENT I.D.	: MW-7	DATE ANALYZED	: 11/16/92
SAMPLE MATRIX	: WATER	UNITS	: ug/L
EPA METHOD	: 8020 (BETX)	DILUTION FACTOR	: 1

COMPOUND	RESULT
BENZENE	<0.5
ETHYLBENZENE	<0.5
TOLUENE	<0.5
TOTAL XYLENES	0.7

SURROGATE PERCENT RECOVERY		LIMITS
BROMOFLUOROBENZENE	93	76 - 120

Analytical Technologies, Inc.

ATI I.D. # 9211-166-8

VOLATILE ORGANIC ANALYSIS
DATA SUMMARY

CLIENT	: GEOENGINEERS, INC.	DATE SAMPLED	: 11/12/92
PROJECT #	: 0161-228-R04	DATE RECEIVED	: 11/16/92
PROJECT NAME	: UNOCAL - CHELAN	DATE EXTRACTED	: N/A
CLIENT I.D.	: DUP	DATE ANALYZED	: 11/17/92
SAMPLE MATRIX	: WATER	UNITS	: ug/L
EPA METHOD	: 8020 (BETX)	DILUTION FACTOR	: 1

COMPOUND	RESULT
BENZENE	69
ETHYLBENZENE	4.1
TOLUENE	43
TOTAL XYLENES	150

SURROGATE PERCENT RECOVERY		LIMITS
BROMOFLUOROBENZENE	93	76 - 120

Analytical Technologies, Inc.

ATI I.D. # 9211-166

VOLATILE ORGANIC ANALYSIS
QUALITY CONTROL DATA

CLIENT : GEOENGINEERS, INC.
PROJECT # : 0161-228-R04
PROJECT NAME : UNOCAL - CHELAN
EPA METHOD : 8020 (BETX)
SAMPLE MATRIX : WATER

SAMPLE I.D. # : 9211-166-7
DATE EXTRACTED : N/A
DATE ANALYZED : 11/16/92
UNITS : ug/L

COMPOUND	SAMPLE RESULT	SPIKE ADDED	SPIKED RESULT	% REC.	DUP. SPIKED RESULT	DUP. % REC.	RPD
BENZENE	<0.5	20.0	20.9	105	20.7	103	1
TOLUENE	<0.5	20.0	21.7	109	21.2	106	2
TOTAL XYLENES	0.745	40.0	45.2	111H	43.4	107	4

CONTROL LIMITS	% REC.	RPD
BENZENE	77 - 112	20
TOLUENE	72 - 113	20
TOTAL XYLENES	80 - 110	20

SURROGATE RECOVERIES	SPIKE	DUP. SPIKE	LIMITS
BROMOFLUOROBENZENE	96	94	76 - 120

H = Out of limits.

Analytical Technologies, Inc.

ATI I.D. # 9211-166

VOLATILE ORGANIC ANALYSIS
QUALITY CONTROL DATA

CLIENT : GEOENGINEERS, INC.
PROJECT # : 0161-228-R04
PROJECT NAME : UNOCAL - CHELAN
EPA METHOD : 8020 (BETX)
SAMPLE MATRIX : WATER

SAMPLE I.D. # : 9211-165-13
DATE EXTRACTED : N/A
DATE ANALYZED : 11/17/92
UNITS : ug/L

COMPOUND	SAMPLE RESULT	SPIKE ADDED	SPIKED RESULT	% REC.	DUP. SPIKED RESULT	DUP. % REC.	RPD
BENZENE	<0.5	20.0	17.3	87	16.8	84	3
TOLUENE	<0.5	20.0	18.2	91	17.0	85	7
TOTAL XYLENES	<0.5	40.0	36.2	91	33.9	85	7

CONTROL LIMITS	% REC.	RPD
BENZENE	77 - 112	20
TOLUENE	72 - 113	20
TOTAL XYLENES	80 - 110	20

SURROGATE RECOVERIES	SPIKE	DUP. SPIKE	LIMITS
BROMOFLUOROBENZENE	99	96	76 - 120

Analytical Technologies, Inc.

ATI I.D. # 9211-166

VOLATILE ORGANIC ANALYSIS
QUALITY CONTROL DATA

CLIENT : GEOENGINEERS, INC.
PROJECT # : 0161-228-R04
PROJECT NAME : UNOCAL - CHELAN
EPA METHOD : 8020 (BETX)
SAMPLE MATRIX : WATER

SAMPLE I.D. # : BLANK SPIKE
DATE EXTRACTED : N/A
DATE ANALYZED : 11/16/92
UNITS : ug/L

COMPOUND	SAMPLE RESULT	SPIKE ADDED	SPIKED RESULT	% REC.	DUP. SPIKED RESULT	DUP. % REC.	RPD
BENZENE	<0.5	20.0	21.0	105	20.7	104	1
TOLUENE	<0.5	20.0	21.9	110	21.6	108	1
TOTAL XYLENES	<0.5	40.0	44.7	112	43.5	109	3

CONTROL LIMITS	% REC.	RPD
BENZENE	80 - 111	20
TOLUENE	78 - 111	20
TOTAL XYLENES	80 - 114	20

SURROGATE RECOVERIES	SPIKE	DUP. SPIKE	LIMITS
BROMOFLUOROBENZENE	95	96	76 - 120

Analytical Technologies, Inc.

ATI I.D. # 9211-166

VOLATILE ORGANIC ANALYSIS
QUALITY CONTROL DATA

CLIENT : GEOENGINEERS, INC.
PROJECT # : 0161-228-R04
PROJECT NAME : UNOCAL - CHELAN
EPA METHOD : 8020 (BETX)
SAMPLE MATRIX : WATER

SAMPLE I.D. # : BLANK SPIKE
DATE EXTRACTED : N/A
DATE ANALYZED : 11/17/92
UNITS : ug/L

COMPOUND	SAMPLE RESULT	SPIKE ADDED	SPIKED RESULT	% REC.	DUP. SPIKED RESULT	DUP. % REC.	RPD
BENZENE	<0.5	20.0	17.8	89	17.2	86	3
TOLUENE	<0.5	20.0	18.2	91	17.7	89	3
TOTAL XYLENES	<0.5	40.0	36.2	91	35.6	89	2

CONTROL LIMITS	% REC.	RPD
BENZENE	80 - 111	20
TOLUENE	78 - 111	20
TOTAL XYLENES	80 - 114	20

SURROGATE RECOVERIES	SPIKE	DUP. SPIKE	LIMITS
BROMOFLUOROBENZENE	98	98	76 - 120

Analytical Technologies, Inc.

ATI I.D. # 9211-166

TOTAL PETROLEUM HYDROCARBON ANALYSIS
DATA SUMMARY

CLIENT	: GEOENGINEERS, INC.	DATE SAMPLED	: N/A
PROJECT #	: 0161-228-R04	DATE RECEIVED	: N/A
PROJECT NAME	: UNOCAL - CHELAN	DATE EXTRACTED	: N/A
CLIENT I.D.	: METHOD BLANK	DATE ANALYZED	: 11/16/92
SAMPLE MATRIX	: WATER	UNITS	: mg/L
METHOD	: WA DOE WTPH-G	DILUTION FACTOR	: 1

COMPOUND	RESULT
FUEL HYDROCARBONS	<0.1
HYDROCARBON RANGE	TOLUENE TO DODECANE
HYDROCARBON QUANTITATION USING	GASOLINE

SURROGATE PERCENT RECOVERY		LIMITS
TRIFLUOROTOLUENE	91	50 - 150

Analytical Technologies, Inc.

ATI I.D. # 9211-166-2

TOTAL PETROLEUM HYDROCARBON ANALYSIS
DATA SUMMARY

CLIENT	: GEOENGINEERS, INC.	DATE SAMPLED	: 11/12/92
PROJECT #	: 0161-228-R04	DATE RECEIVED	: 11/16/92
PROJECT NAME	: UNOCAL - CHELAN	DATE EXTRACTED	: N/A
CLIENT I.D.	: MW-1	DATE ANALYZED	: 11/16/92
SAMPLE MATRIX	: WATER	UNITS	: mg/L
METHOD	: WA DOE WTPH-G	DILUTION FACTOR	: 1

COMPOUND	RESULT
FUEL HYDROCARBONS	1.6
HYDROCARBON RANGE	TOLUENE TO DODECANE
HYDROCARBON QUANTITATION USING	GASOLINE

SURROGATE PERCENT RECOVERY		LIMITS
TRIFLUOROTOLUENE	82	50 - 150

Analytical Technologies, Inc.

ATI I.D. # 9211-166-3

TOTAL PETROLEUM HYDROCARBON ANALYSIS
DATA SUMMARY

CLIENT	: GEOENGINEERS, INC.	DATE SAMPLED	: 11/12/92
PROJECT #	: 0161-228-R04	DATE RECEIVED	: 11/16/92
PROJECT NAME	: UNOCAL - CHELAN	DATE EXTRACTED	: N/A
CLIENT I.D.	: MW-2	DATE ANALYZED	: 11/16/92
SAMPLE MATRIX	: WATER	UNITS	: mg/L
METHOD	: WA DOE WTPH-G	DILUTION FACTOR	: 1

COMPOUND	RESULT
FUEL HYDROCARBONS	<0.1
HYDROCARBON RANGE	TOLUENE TO DODECANE
HYDROCARBON QUANTITATION USING	GASOLINE

SURROGATE PERCENT RECOVERY		LIMITS
TRIFLUOROTOLUENE	92	50 - 150

Analytical Technologies, Inc.

ATI I.D. # 9211-166-4

TOTAL PETROLEUM HYDROCARBON ANALYSIS
DATA SUMMARY

CLIENT	: GEOENGINEERS, INC.	DATE SAMPLED	: 11/12/92
PROJECT #	: 0161-228-R04	DATE RECEIVED	: 11/16/92
PROJECT NAME	: UNOCAL - CHELAN	DATE EXTRACTED	: N/A
CLIENT I.D.	: MW-3	DATE ANALYZED	: 11/16/92
SAMPLE MATRIX	: WATER	UNITS	: mg/L
METHOD	: WA DOE WTPH-G	DILUTION FACTOR	: 1

COMPOUND	RESULT
FUEL HYDROCARBONS	<0.1
HYDROCARBON RANGE	TOLUENE TO DODECANE
HYDROCARBON QUANTITATION USING	GASOLINE

SURROGATE PERCENT RECOVERY		LIMITS
TRIFLUOROTOLUENE	90	50 - 150

Analytical Technologies, Inc.

ATI I.D. # 9211-166-5

TOTAL PETROLEUM HYDROCARBON ANALYSIS
DATA SUMMARY

CLIENT	: GEOENGINEERS, INC.	DATE SAMPLED	: 11/12/92
PROJECT #	: 0161-228-R04	DATE RECEIVED	: 11/16/92
PROJECT NAME	: UNOCAL - CHELAN	DATE EXTRACTED	: N/A
CLIENT I.D.	: MW-5	DATE ANALYZED	: 11/16/92
SAMPLE MATRIX	: WATER	UNITS	: mg/L
METHOD	: WA DOE WTPH-G	DILUTION FACTOR	: 1

COMPOUND	RESULT
FUEL HYDROCARBONS	2.1
HYDROCARBON RANGE	TOLUENE TO DODECANE
HYDROCARBON QUANTITATION USING	GASOLINE

SURROGATE PERCENT RECOVERY		LIMITS
TRIFLUOROTOLUENE	73	50 - 150

Analytical Technologies, Inc.

ATI I.D. # 9211-166-6

TOTAL PETROLEUM HYDROCARBON ANALYSIS
DATA SUMMARY

CLIENT	: GEOENGINEERS, INC.	DATE SAMPLED	: 11/12/92
PROJECT #	: 0161-228-R04	DATE RECEIVED	: 11/16/92
PROJECT NAME	: UNOCAL - CHELAN	DATE EXTRACTED	: N/A
CLIENT I.D.	: MW-6	DATE ANALYZED	: 11/17/92
SAMPLE MATRIX	: WATER	UNITS	: mg/L
METHOD	: WA DOE WTPH-G	DILUTION FACTOR	: 1

COMPOUND	RESULT
FUEL HYDROCARBONS	<0.1
HYDROCARBON RANGE	TOLUENE TO DODECANE
HYDROCARBON QUANTITATION USING	GASOLINE

SURROGATE PERCENT RECOVERY		LIMITS
TRIFLUOROTOLUENE	93	50 - 150

Analytical Technologies, Inc.

ATI I.D. # 9211-166-7

TOTAL PETROLEUM HYDROCARBON ANALYSIS
DATA SUMMARY

CLIENT	: GEOENGINEERS, INC.	DATE SAMPLED	: 11/15/92
PROJECT #	: 0161-228-R04	DATE RECEIVED	: 11/16/92
PROJECT NAME	: UNOCAL - CHELAN	DATE EXTRACTED	: N/A
CLIENT I.D.	: MW-7	DATE ANALYZED	: 11/16/92
SAMPLE MATRIX	: WATER	UNITS	: mg/L
METHOD	: WA DOE WTPH-G	DILUTION FACTOR	: 1

COMPOUND	RESULT
FUEL HYDROCARBONS	<0.1
HYDROCARBON RANGE	TOLUENE TO DODECANE
HYDROCARBON QUANTITATION USING	GASOLINE

SURROGATE PERCENT RECOVERY		LIMITS
TRIFLUOROTOLUENE	95	50 - 150

Analytical Technologies, Inc.

ATI I.D. # 9211-166-8

TOTAL PETROLEUM HYDROCARBON ANALYSIS
DATA SUMMARY

CLIENT	: GEOENGINEERS, INC.	DATE SAMPLED	: 11/12/92
PROJECT #	: 0161-228-R04	DATE RECEIVED	: 11/16/92
PROJECT NAME	: UNOCAL - CHELAN	DATE EXTRACTED	: N/A
CLIENT I.D.	: DUP	DATE ANALYZED	: 11/17/92
SAMPLE MATRIX	: WATER	UNITS	: mg/L
METHOD	: WA DOE WTPH-G	DILUTION FACTOR	: 1

COMPOUND	RESULT
FUEL HYDROCARBONS	1.4
HYDROCARBON RANGE	TOLUENE TO DODECANE
HYDROCARBON QUANTITATION USING	GASOLINE

SURROGATE PERCENT RECOVERY		LIMITS
TRIFLUOROTOLUENE	88	50 - 150

Analytical Technologies, Inc.

ATI I.D. # 9211-166

TOTAL PETROLEUM HYDROCARBON ANALYSIS
QUALITY CONTROL DATA

CLIENT	: GEOENGINEERS, INC.	SAMPLE I.D. #	: 9211-166-7
PROJECT #	: 0161-228-R04	DATE EXTRACTED	: N/A
PROJECT NAME	: UNOCAL - CHELAN	DATE ANALYZED	: 11/16/92
METHOD	: WA DOE WTPH-G	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 (GASOLINE)	<0.1	<0.1	NC	2.00	2.06	103	2.04	102	1

CONTROL LIMITS	% REC.	RPD
GASOLINE	58 - 127	20

SURROGATE RECOVERIES	SPIKE	DUP. SPIKE	LIMITS
TRIFLUOROTOLUENE	96	99	50 - 150

NC = Not Calculable.

Analytical Technologies, Inc.

ATI I.D. # 9211-166

TOTAL PETROLEUM HYDROCARBON ANALYSIS
DATA SUMMARY

CLIENT	: GEOENGINEERS, INC.	DATE SAMPLED	: N/A
PROJECT #	: 0161-228-R04	DATE RECEIVED	: N/A
PROJECT NAME	: UNOCAL - CHELAN	DATE EXTRACTED	: 11/17/92
CLIENT I.D.	: METHOD BLANK	DATE ANALYZED	: 11/19/92
SAMPLE MATRIX	: WATER	UNITS	: mg/L
METHOD	: WA DOE WTPH-D	DILUTION FACTOR	: 1

COMPOUND	RESULT
FUEL HYDROCARBONS	<0.5
HYDROCARBON RANGE	C12 - C24
HYDROCARBON QUANTITATION USING	DIESEL

SURROGATE PERCENT RECOVERY		LIMITS
O-TERPHENYL	94	50 - 150

Analytical Technologies, Inc.

ATI I.D. # 9211-166-2

TOTAL PETROLEUM HYDROCARBON ANALYSIS
DATA SUMMARY

CLIENT	: GEOENGINEERS, INC.	DATE SAMPLED	: 11/12/92
PROJECT #	: 0161-228-R04	DATE RECEIVED	: 11/16/92
PROJECT NAME	: UNOCAL - CHELAN	DATE EXTRACTED	: 11/17/92
CLIENT I.D.	: MW-1	DATE ANALYZED	: 11/18/92
SAMPLE MATRIX	: WATER	UNITS	: mg/L
METHOD	: WA DOE WTPH-D	DILUTION FACTOR	: 1

COMPOUND	RESULT
FUEL HYDROCARBONS	12
HYDROCARBON RANGE	C12 - C24
HYDROCARBON QUANTITATION USING	DIESEL

SURROGATE PERCENT RECOVERY		LIMITS
O-TERPHENYL	95	50 - 150

Analytical Technologies, Inc.

ATI I.D. # 9211-166-7

TOTAL PETROLEUM HYDROCARBON ANALYSIS
DATA SUMMARY

CLIENT	: GEOENGINEERS, INC.	DATE SAMPLED	: 11/15/92
PROJECT #	: 0161-228-R04	DATE RECEIVED	: 11/16/92
PROJECT NAME	: UNOCAL - CHELAN	DATE EXTRACTED	: 11/17/92
CLIENT I.D.	: MW-7	DATE ANALYZED	: 11/18/92
SAMPLE MATRIX	: WATER	UNITS	: mg/L
METHOD	: WA DOE WTPH-D	DILUTION FACTOR	: 1

COMPOUND	RESULT
FUEL HYDROCARBONS	1.7
HYDROCARBON RANGE	C12 - C24
HYDROCARBON QUANTITATION USING	DIESEL

SURROGATE PERCENT RECOVERY		LIMITS
O-TERPHENYL	97	50 - 150

Analytical Technologies, Inc.

ATI I.D. # 9211-166

TOTAL PETROLEUM HYDROCARBONS ANALYSIS
CONTINUING CALIBRATION STANDARDS SUMMARY

CLIENT	: GEOENGINEERS, INC.	DATE SAMPLED	: N/A
PROJECT #	: 0161-228-R04	DATE RECEIVED	: N/A
PROJECT NAME	: UNOCAL - CHELAN	DATE EXTRACTED	: N/A
CLIENT I.D.	: 500 PPM CCV	DATE ANALYZED	: 11/18/92
SAMPLE MATRIX	: WATER	UNITS	: %
METHOD	: WA DOE WTPH-D	DILUTION FACTOR	: 1

COMPOUND	% DIFFERENCE
FUEL HYDROCARBONS QUANTITATED USING DIESEL	1

Analytical Technologies, Inc.

ATI I.D. # 9211-166

TOTAL PETROLEUM HYDROCARBON ANALYSIS
QUALITY CONTROL DATA

CLIENT	: GEOENGINEERS, INC.	SAMPLE I.D. #	: BLANK SPIKE
PROJECT #	: 0161-228-R04	DATE EXTRACTED	: 11/17/92
PROJECT NAME	: UNOCAL - CHELAN	DATE ANALYZED	: 11/19/92
METHOD	: WA DOE WTPH-D	UNITS	: mg/L
SAMPLE MATRIX	: WATER		

COMPOUND	SAMPLE RESULT	SPIKE ADDED	SPIKED RESULT	% REC.	DUP. SPIKED RESULT	DUP. % REC.	RPD
PETROLEUM HYDROCARBONS (DIESEL)	<0.5	5.00	4.41	88	4.46	89	1

CONTROL LIMITS	% REC.	RPD
DIESEL	70 - 115	20

SURROGATE RECOVERIES	SPIKE	DUP. SPIKE	LIMITS
O-TERPHENYL	90	93	50 - 150

Analytical Technologies, Inc.

ATI I.D. # 9211-166

OIL & GREASE
DATA SUMMARY

CLIENT : GEOENGINEERS, INC.
PROJECT # : 0161-228-R04
PROJECT NAME : UNOCAL - CHELAN
EPA METHOD : 413.2

DATE EXTRACTED : 11/18/92
DATE ANALYZED : 11/19/92
UNITS : mg/L
SAMPLE MATRIX : WATER

ATI I.D. #	CLIENT I.D.	OIL & GREASE
9211-166-1	DRUM	1.2
METHOD BLANK	-	<1.0

Analytical Technologies, Inc.

ATI I.D. # 9211-166

OIL & GREASE
QUALITY CONTROL DATA

CLIENT : GEOENGINEERS, INC.
PROJECT # : 0161-228-R04
PROJECT NAME : UNOCAL - CHELAN
EPA METHOD : 413.2
SAMPLE MATRIX : WATER

SAMPLE I.D. # : ICV
DATE EXTRACTED : N/A
DATE ANALYZED : 11/19/92
UNITS : mg/L

COMPOUND	SAMPLE RESULT	SAMPLE DUP. RESULT	RPD	SPIKE ADDED	SPIKED RESULT	% REC.	DUP. SPIKED RESULT	DUP. % REC.	RPD
OIL & GREASE	N/A	N/A	N/A	100	101	101	N/A	N/A	N/A

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

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

Analytical Technologies, Inc.

ATI I.D. # 9211-166

OIL & GREASE
QUALITY CONTROL DATA

CLIENT : GEOENGINEERS, INC.
PROJECT # : 0161-228-R04
PROJECT NAME : UNOCAL - CHELAN
EPA METHOD : 413.2
SAMPLE MATRIX : WATER

SAMPLE I.D. # : BLANK SPIKE
DATE EXTRACTED : 11/18/92
DATE ANALYZED : 11/19/92
UNITS : mg/L

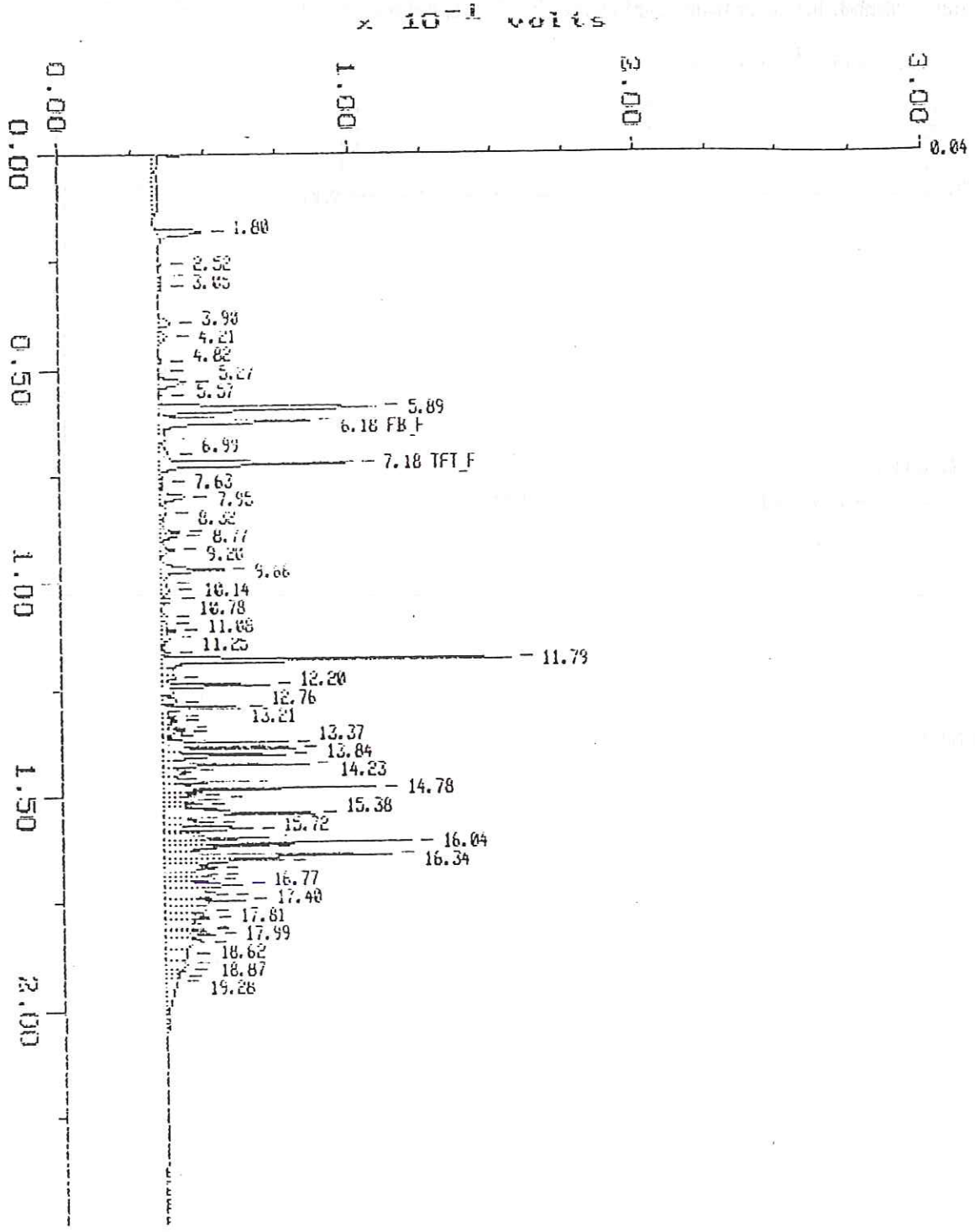
COMPOUND	SAMPLE RESULT	SAMPLE DUP. RESULT	RPD	SPIKE ADDED	SPIKED RESULT	% REC.	DUP. SPIKED RESULT	DUP. % REC.	RPD
OIL & GREASE	<1.0	N/A	N/A	10	8.2	82	8.5	85	4

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

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

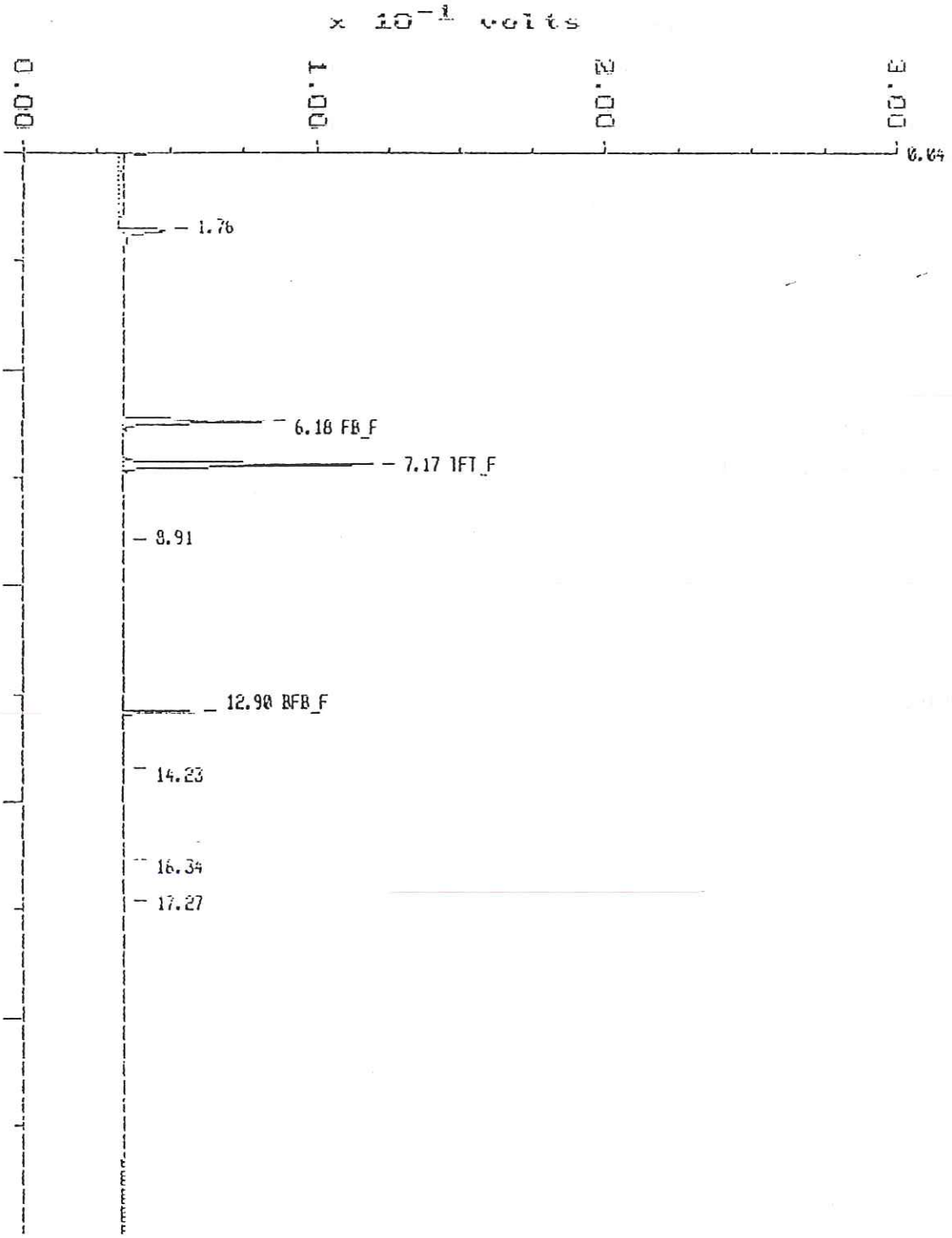
WA DOE WTPH-G

Sample: 9211-166-5 Channel: JEROME-F10 Filename: 1116JR17
Acquired: 16-NOV-92 23:50 Method: H:\BRO2\MAXDATA\JEROME\JR111292 Operator:



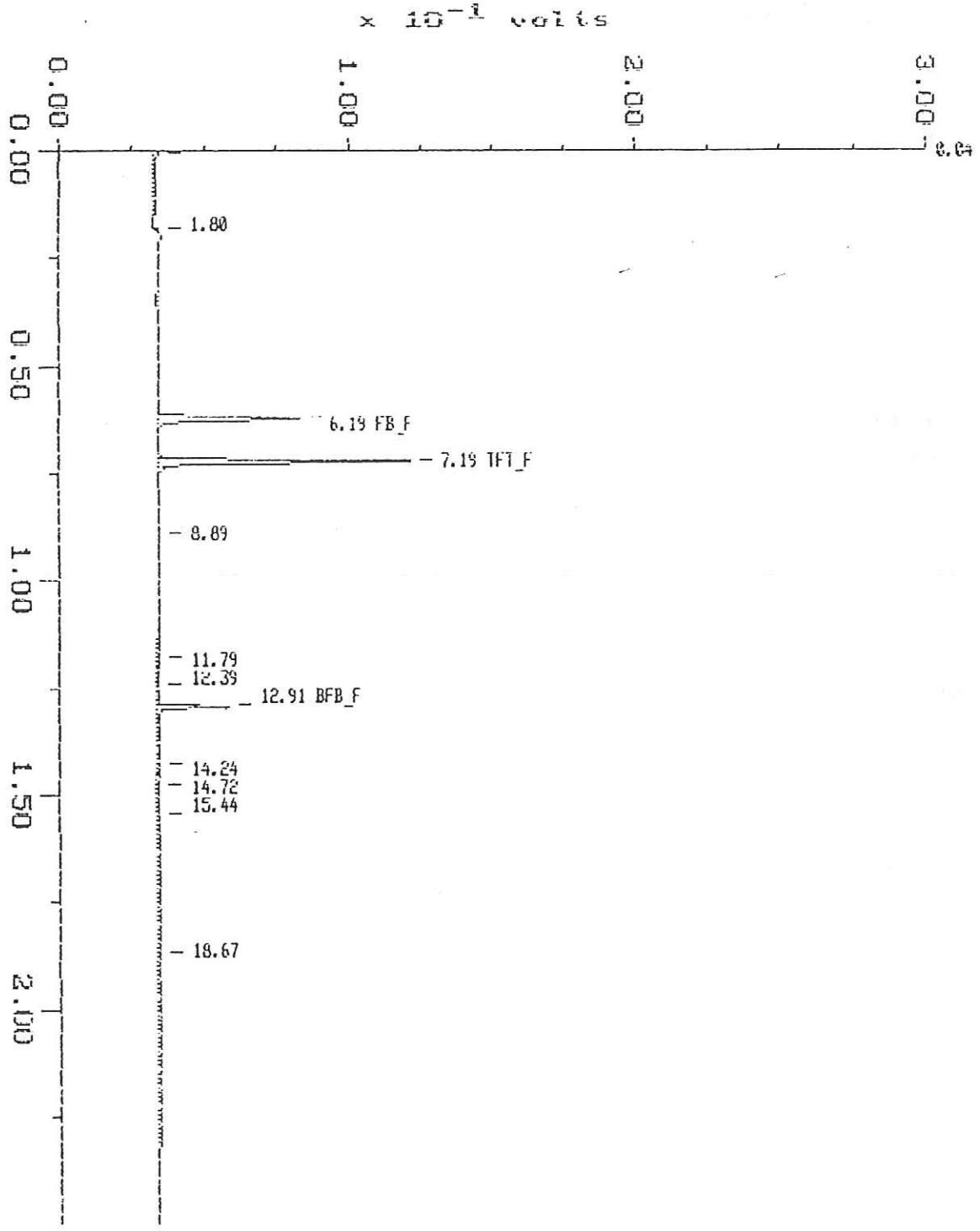
WA DOE WTPH-G

Sample: 9211-166-6 Channel: JEROME-FID Filename: 1116JR20
Acquired: 17-NOV-92 1:16 Method: H:\BRO2\MAXDATA\JEROME\JR111292 Operator:



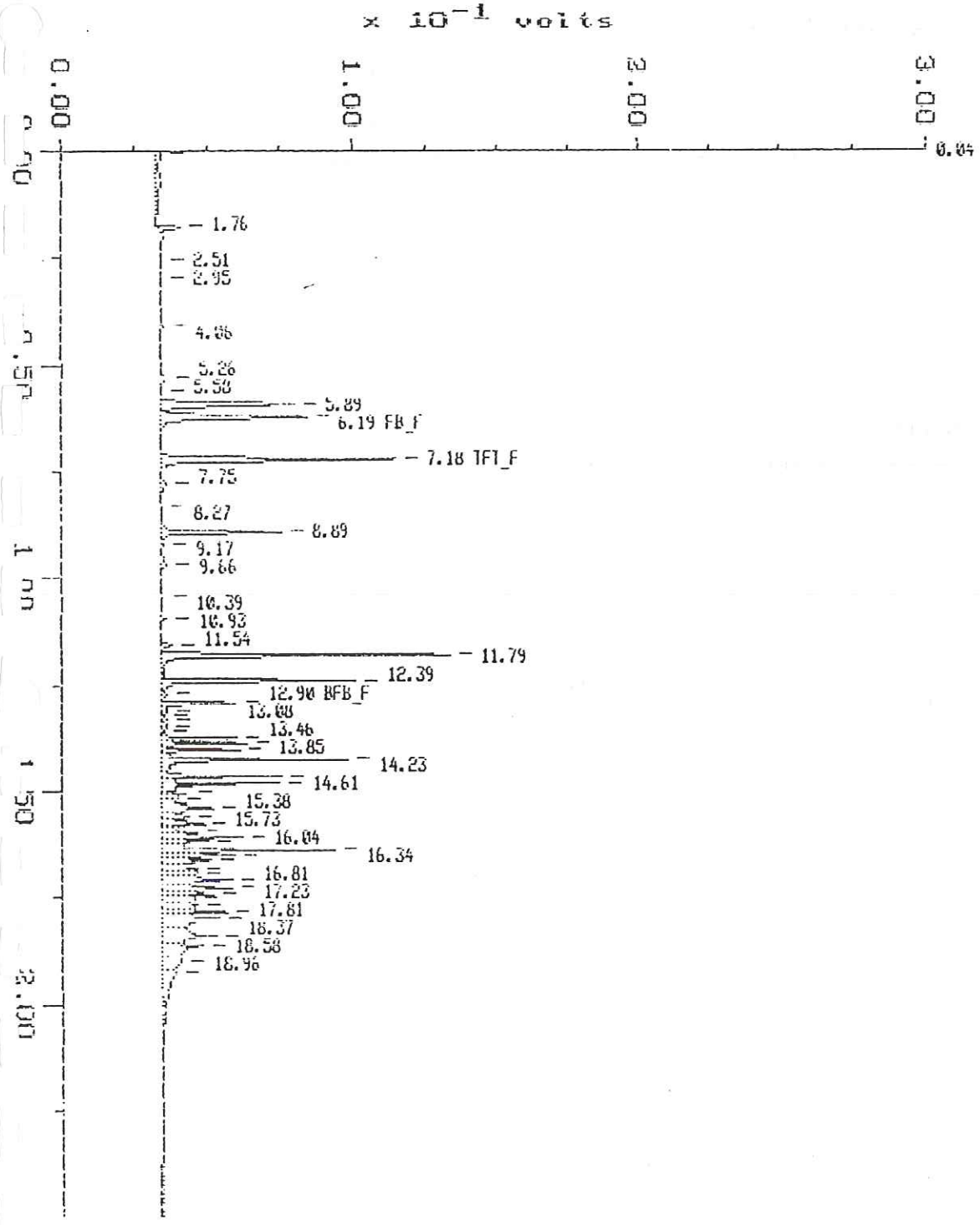
WA DOE WTPH-G

Sample: 9211-166-7 Channel: JEROME-FID Filename: 1116JR08
Acquired: 16-NOV-92 19:33 Method: H:\0K02\MAXDATA\JEROME\JR111292 Operator:



WA DOE WTPH-G

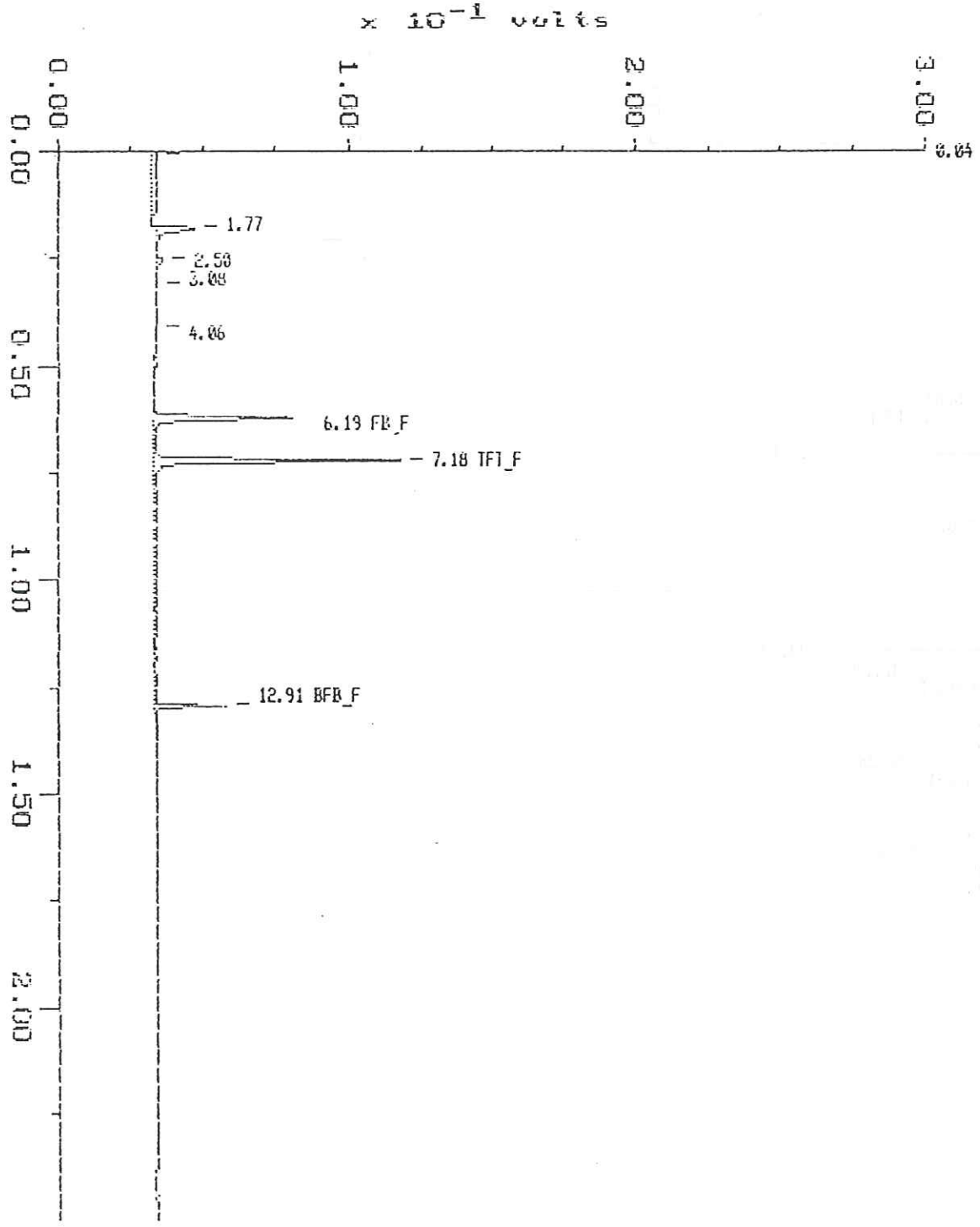
Sample: 9211-166-8 Channel: JEROME-FID Filename: 1116JR21
Acquired: 17-NOV-92 1:44 Method: H:\BRO2\MAXDATA\JEROME\JR111292 Operator:



WA DOE WTPH-G

Blank

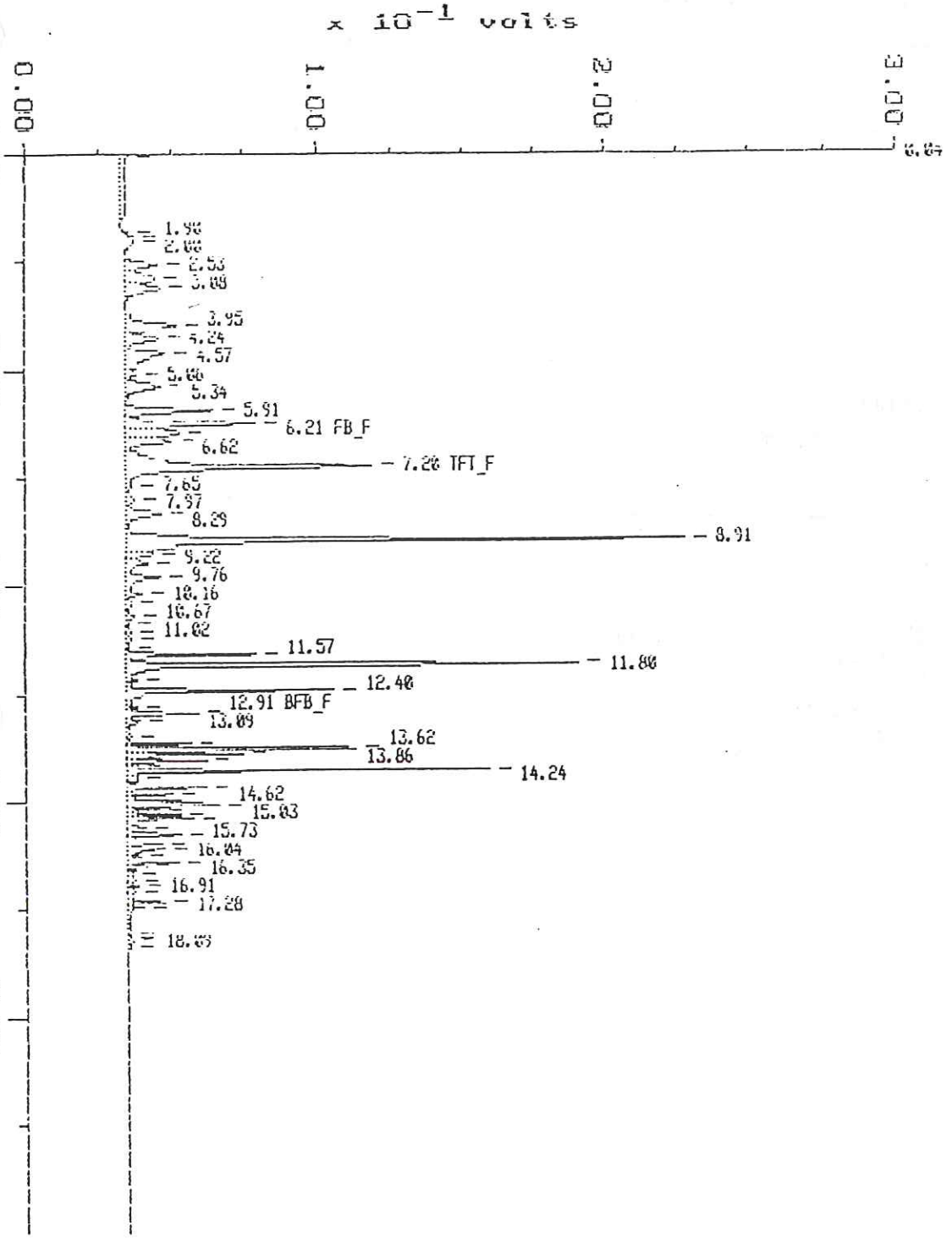
Sample: WRB 11/16 Channel: JEROME-FID Filename: 1116JR07
Acquired: 16-NOV-92 18:25 Method: H:\BRO2\MAXDATA\JEROME\JR111292 Operator:



WA DOE WTPH-G

Continuing Calibration

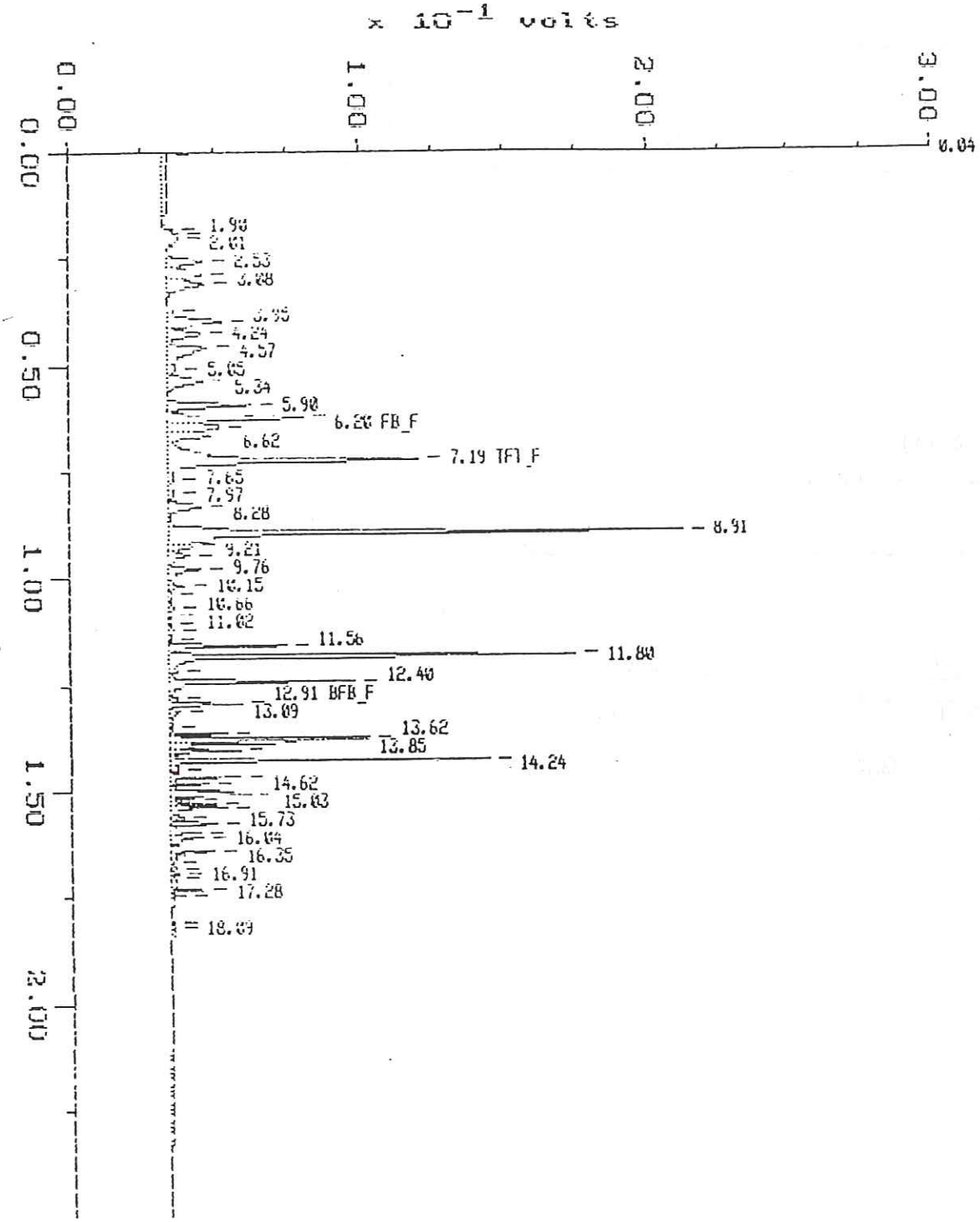
Sample: WMG 11/16 GAS Channel: JEROME-F1D Filename: 1116JR02
Acquired: 16-NOV-92 8:29 Method: H:\BRG2\MAXDATA\JEROME\JR111292 Operator:



WA DOE WTPH-G

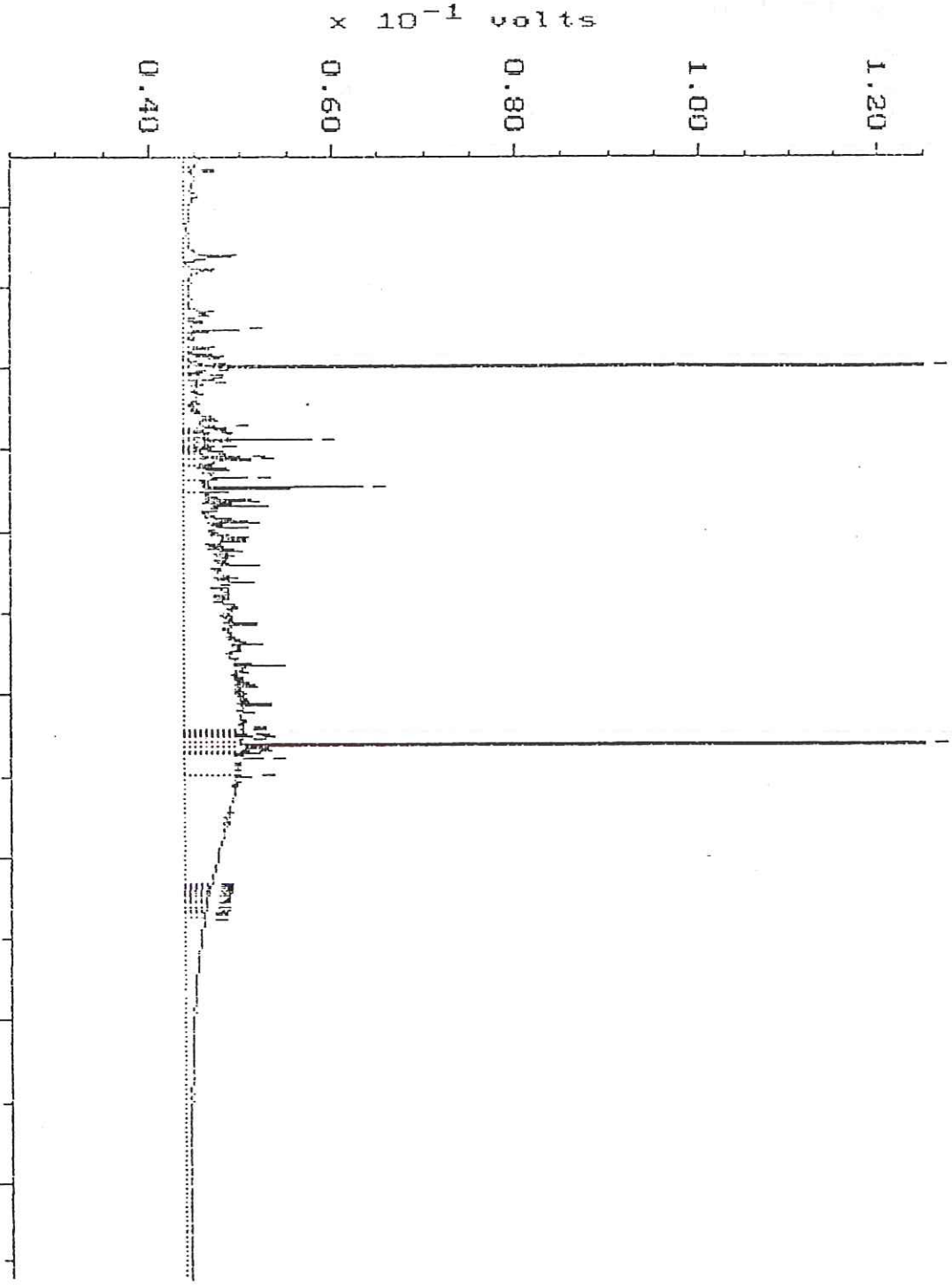
Continuing Calibration

Sample: C.C. 2 PPM Channel: JEROME-FID Filename: 1116JR43
Acquired: 17-NOV-92 12:12 Method: H:\BRO2\MAXDATA\JEROME\JR111292 Operator:



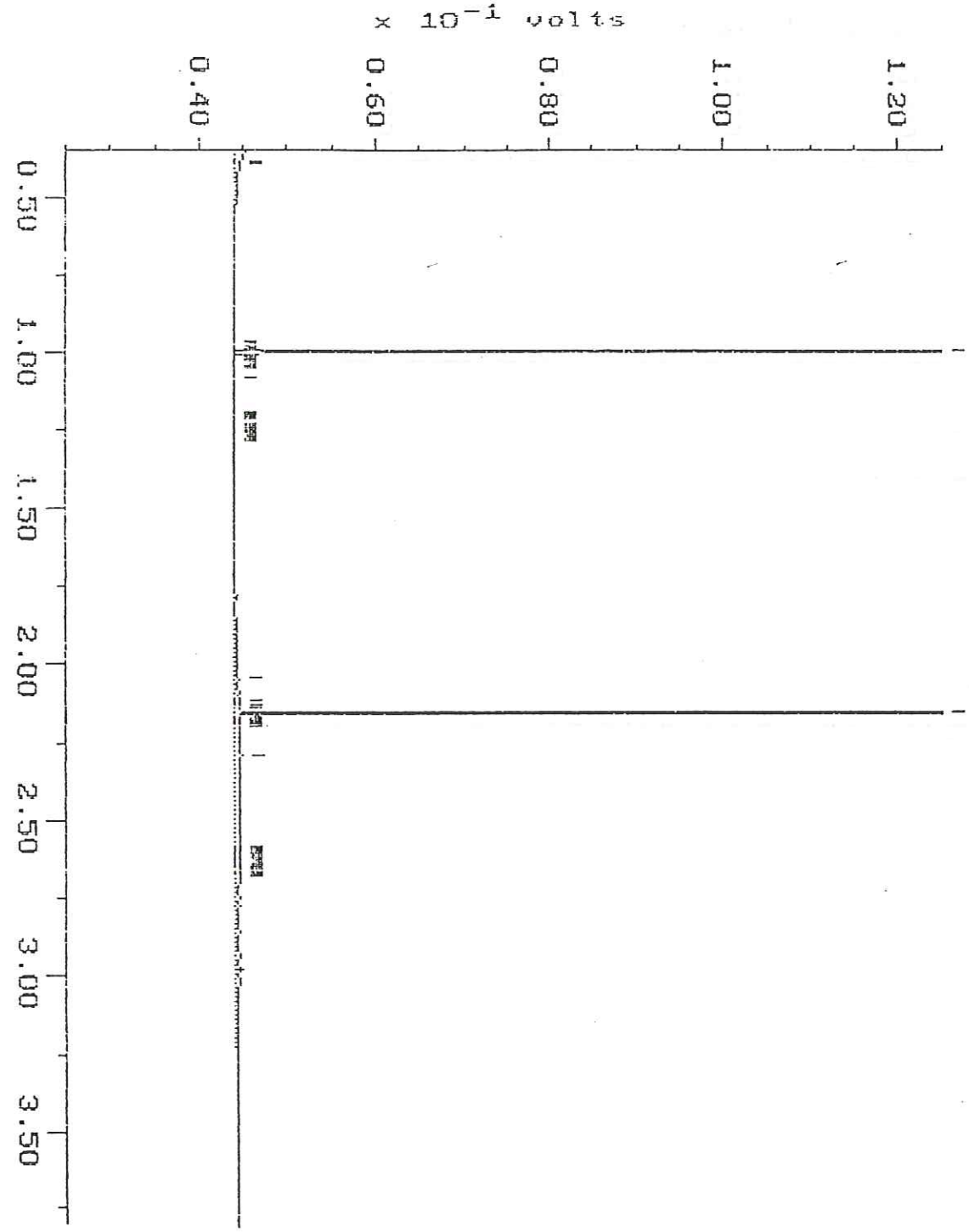
WA DOE WTPH-D

Sample: 9211-166-2 Channel: CLARENCE Filename: 1119SC05
Acquired: 19-NOV-92 19:42 Method: L:\BRO2\MAXDATA\SERGE-C\FUEL1118 Operator: ATI
Inj Vol: 1.00
Comments: ATI RUSH FUELS: DEDICATED TO QUALITY CLIENT SERVICE



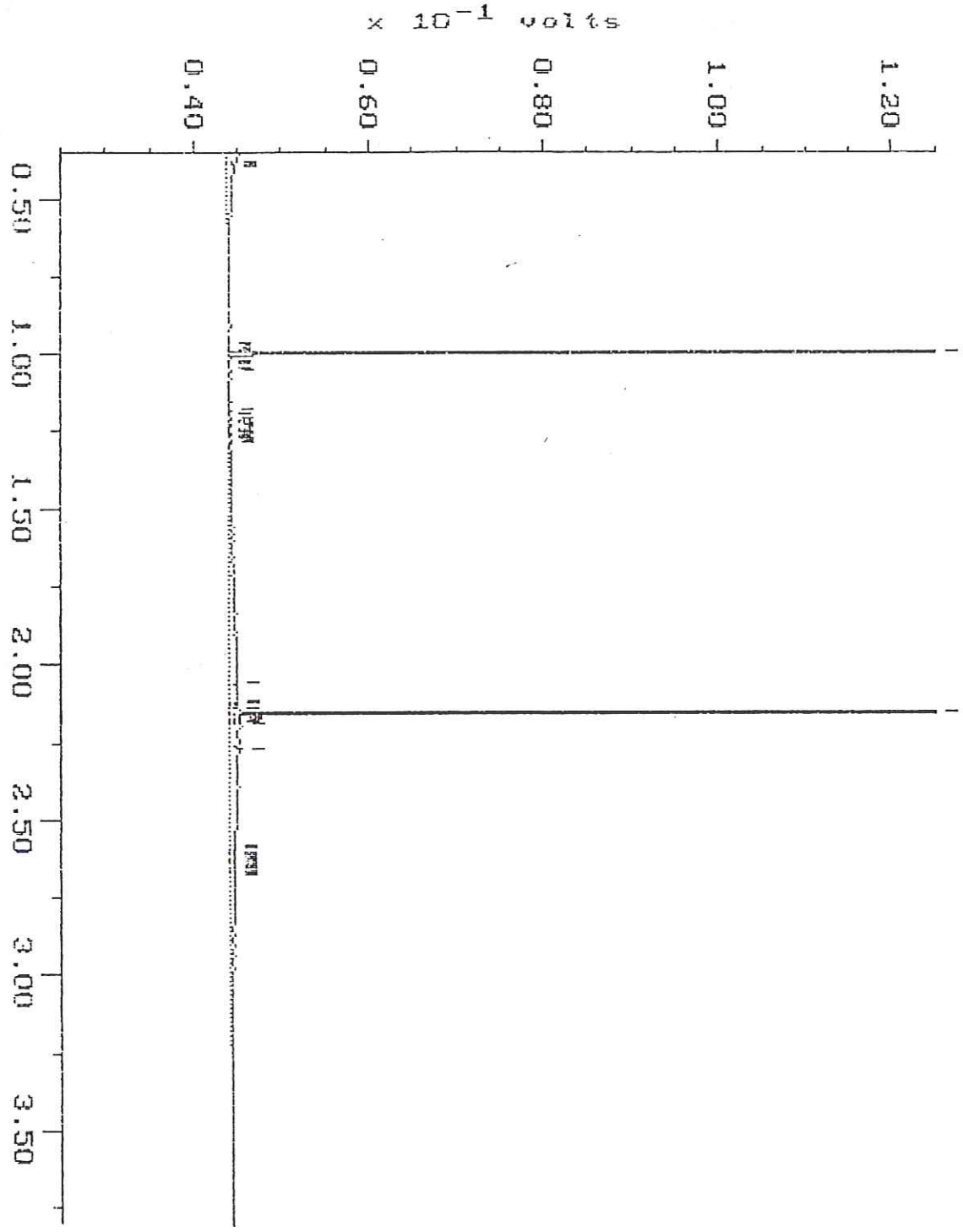
WA DOE WTPH-D

Sample: 9211-166-3 Channel: CLARENCE Filename: 1118SC06
Acquired: 18-NOV-92 20:28 Method: L:\BRG2\MAXDATA\SERGE-C\FUEL1118 Operator: ATI
Inj Vol: 1.00
Comments: ATI RUSH FUELS: DEDICATED TO QUALITY CLIENT SERVICE



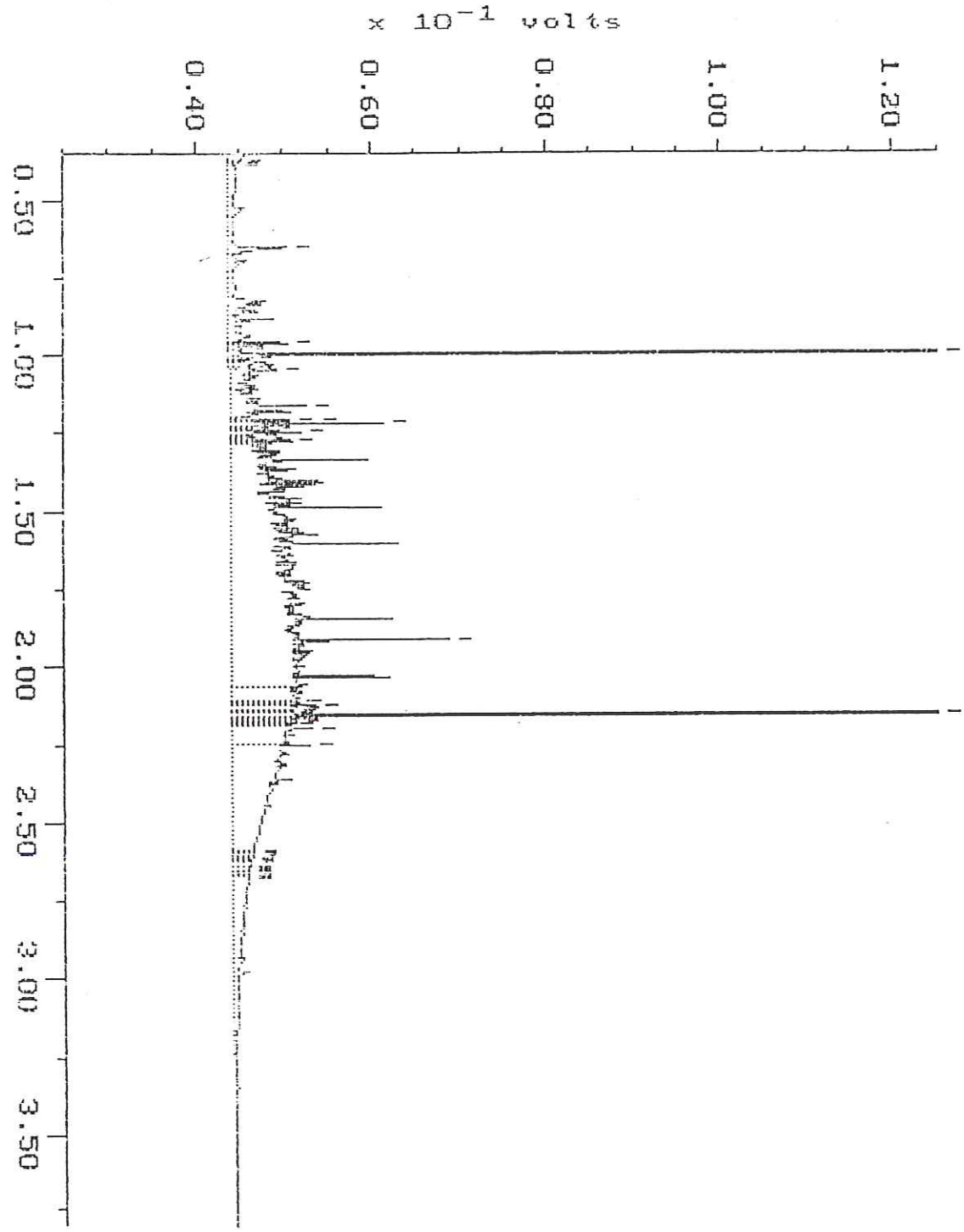
WA DOE WTPH-D

Sample: 9211-166-4 Channel: CLARENCE Filename: 1118SC07
Acquired: 18-NOV-92 21:14 Method: L:\BRG2\MAXDATA\SERGE-C\FUEL1118 Operator: ATI
Inj Vol: 1.00
Comments: ATI RUSH FUELS: DEDICATED TO QUALITY CLIENT SERVICE



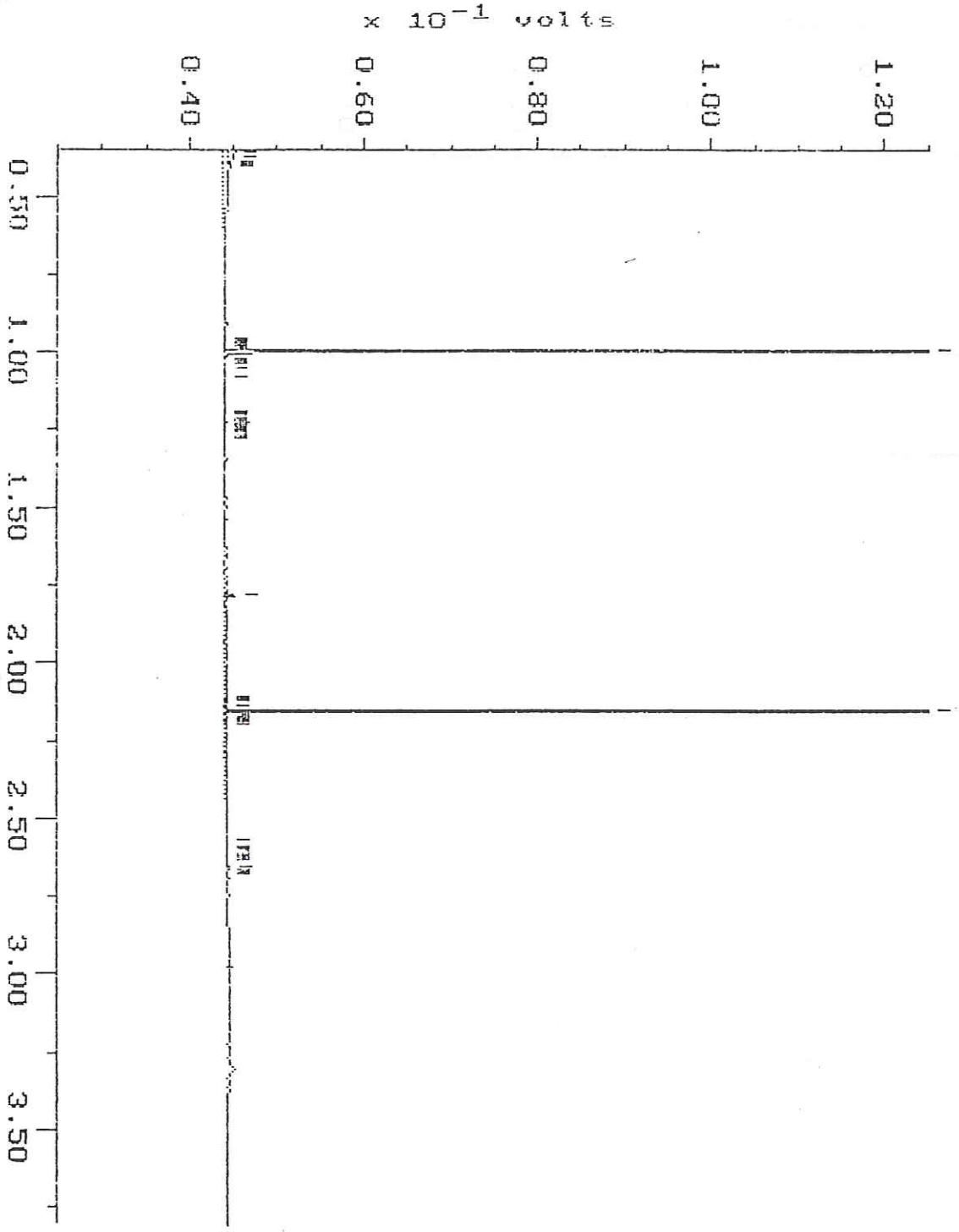
WA DOE WTPH-D

Sample: 9211-166-5 Channel: CLARENCE Filename: 1118SC08
Acquired: 18-NOV-92 22:00 Method: L:\BRG2\MAXDATA\SERGE-C\FUEL1118 Operator: ATI
Inj Vol: 1.00
Comments: ATI RUSH FUELS: DEDICATED TO QUALITY CLIENT SERVICE



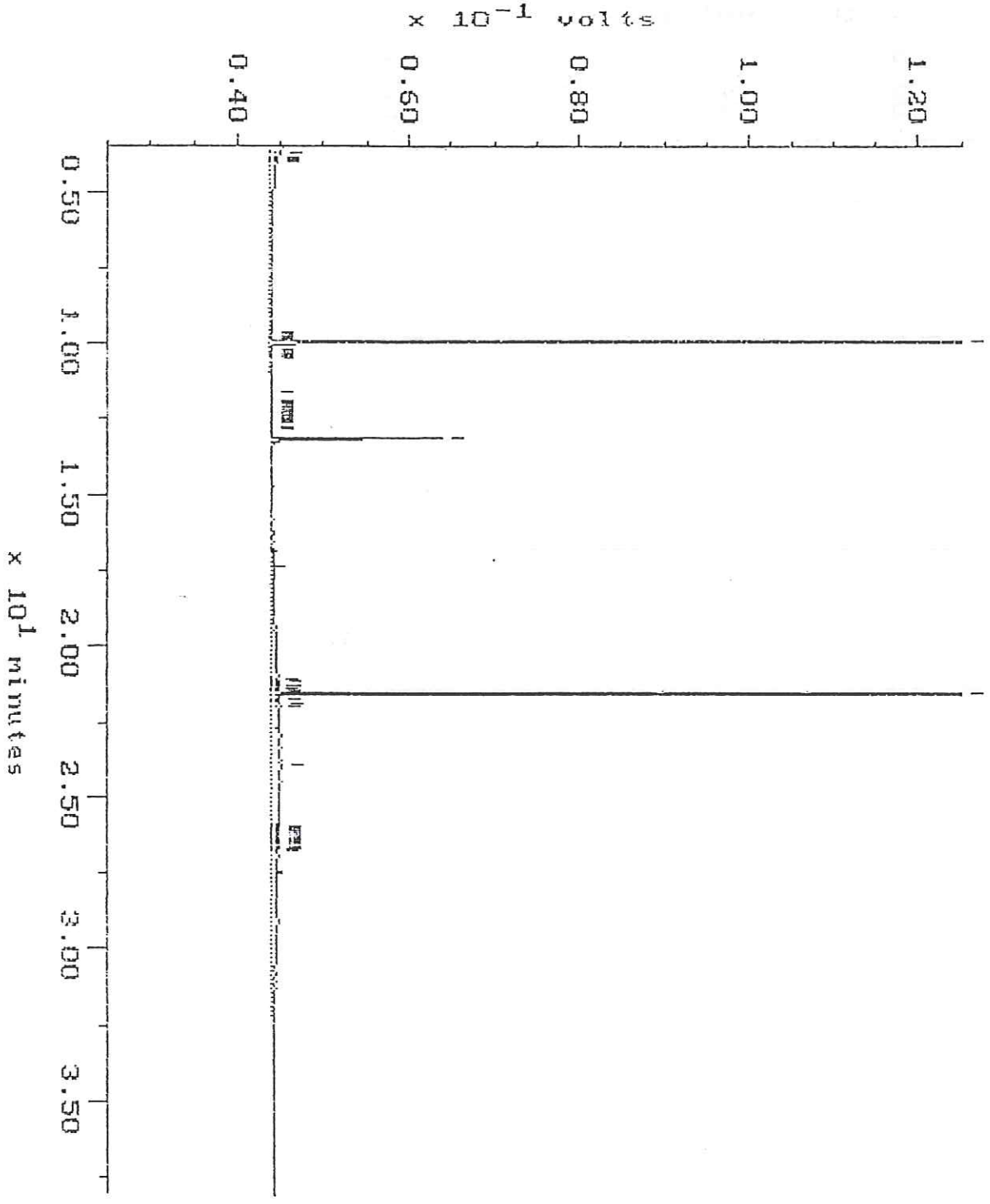
WA DOE WTPH-D

Sample: 9211-166-6 Channel: CLARENCE Filename: 1118SC09
Acquired: 18-NOV-92 22:46 Method: L:\BR02\MAXDATA\SERGE-C\FUEL1118 Operator: ATI
Inj Vol: 1.00
Comments: ATI RUSH FUELS: DEDICATED TO QUALITY CLIENT SERVICE



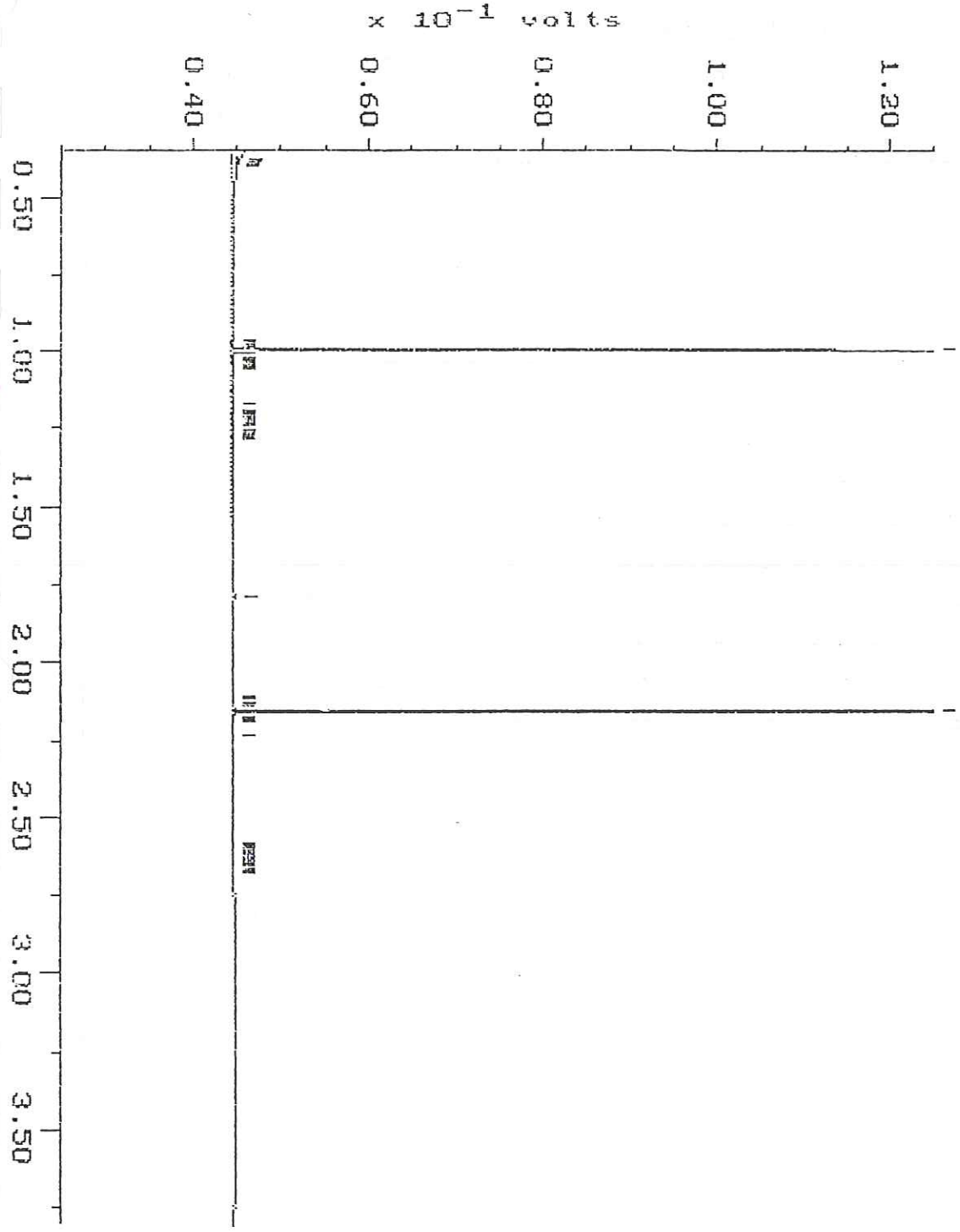
WA DOE WTPH-D

Sample: 9211-166-7 Channel: CLARENCE Filename: 1118SC10
Acquired: 18-NOV-92 23:33 Method: L:\BR02\MAXDATA\SERGE-C\FUEL1118 Operator: ATI
Inj Vol: 1.00
Comments: ATI RUSH FUELS: DEDICATED TO QUALITY CLIENT SERVICE



WA DOE WTPH-D

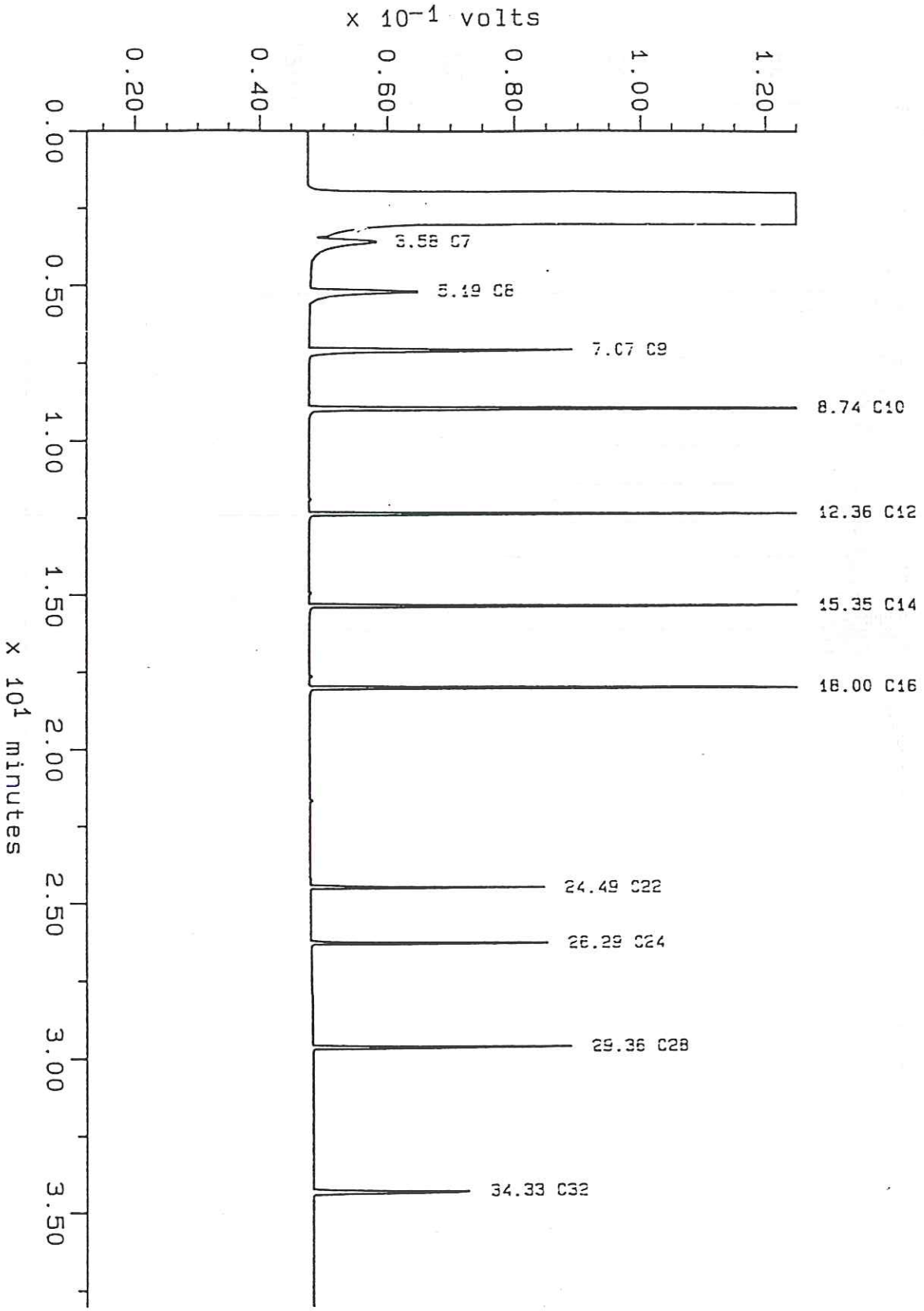
Sample: WRB11-17 Channel: CLARENCE Filename: 1118SC13
Acquired: 19-NOV-92 9:53 Method: L:\BRO2\MAXDATA\SERGE-C\FUEL1118 Operator: ATI
Inj Vol: 1.00
Comments: ATI RUSH FUELS: DEDICATED TO QUALITY CLIENT SERVICE



Sample: ALKANE
Acquired: CLOCK NOT SET
Inj Vol: 1.00

Channel: CLARENCE
Method: H: \BR02\MAXDATA\SERGE-C\FUEL1008

Filename: 1008SC40
Operator: ATI



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

DATE: 11/16/92 Page 1 of 1 ATI ACCESSION # 9211-166

COMPANY: GEI
REPORT TO: Norm Puri
ADDRESS:
PHONE:( ) - FAX:( ) -
PROJECT MANAGER: Norm Puri
PROJECT NUMBER: 21-228-R04 TO1.1
PROJECT NAME: Unocal, Chelan

ATI will DISPOSE / RETURN samples (circle one)

Sample ID	Date	Time	Matrix	LabID	TPH-HCID WA/OR	BETX/TPH-G combo WA/OR	BETX (by 8020) WA/OR	TPH-G WA/OR	TPH-D WA/OR	8015 modified WA/OR	418.1 WA/OR	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 Lead				Total # of Containers/sample
Drum	~~11/12~~ 11/13	11/13	water	1			X					X																						X				4
MW-1	11/13	11/12		2		X			X																													3
MW-2	"			3		X			X																													3
MW-3	"			4		X			X																													3
MW-5	"			5		X			X																													3
MW-6	"			6		X			X																													3
MW-7	~~11/15~~	11/15		7		X			X																													3
Dup	~~11/13~~	11/12		8		X																																2

Turnaround Time	
STANDARD TAT	
1 WEEK TAT	
4 WORK DAY TAT	X
3 WORK DAY TAT	
2 WORK DAY TAT	
24 HOUR TAT	

Sample Receipt	
TOTAL # CONTAINERS RECVD	32
COC SEALS PRESENT?	Y
COC SEALS INTACT?	Y
RECEIVED COLD?	Y
RECEIVED INTACT?	Y
RECEIVED VIA:	

Special Instructions:
BETX for MW-1 through MW-6, and DUP are unpreserved
WTPH-D may have longer TAT if necessary
* Metals needed:

Relinquished By:	Relinquished By:	Relinquished By:
Date: 11/16	Date:	Date:
Time: 1010	Time:	Time:
Received By:	Received By:	Received By:
Date: 11/16/92	Date:	Date:
Time: 1110 ATI WA	Time:	Time:

Corporate Offices: 5550 Morehouse Drive, San Diego, CA 92121 (619)458-9141

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