

UST# 008527

UST# 1556  
PUGET POWER  
KING

2/10/94  
 CN

DEPARTMENT OF ECOLOGY  
 NWRO/TCP TANKS UNIT

INTERIM CLEANUP REPORT   
 SITE CHARACTERIZATION   
 FINAL CLEANUP REPORT   
 OTHER

AFFECTED MEDIA: SOIL   
 OTHER  GW   
 INSPECTOR (INT.)  DATE 1-26-91

REPORT OF REMEDIAL ACTION  
 UNDERGROUND STORAGE TANK REMOVAL  
 STORES BUILDING, RENTON SERVICE CENTER  
 RENTON, WASHINGTON  
 FOR  
 PUGET SOUND POWER & LIGHT

Independent Action Report Update

Site Name: PUGET SOUND POWER

Inc. #: 1556 Date of Report: 2-7-91

County: KING Date Report Rec'd: 1-6-94

Reviewed by: JOAN BAILEY

Comments (please include: free prod., tank info., media, contaminant migration, GW conc. trends, PCS treated/fate?):

NFA -  
REMOVED 2 TANKS (#226 + #227).  
9/27/90. REMOVED TANKS AS THEY  
DID RELATED HYDRAULIC SOIL CLEANUP.  
GW @ 8' IN TANK EXCAVATION  
DISPOSED OF 235 yd<sup>3</sup> OF PCS @ KATSAP  
CO. DISPOSAL. NO GW PROBLEMS @  
THESE 2 TANKS. GW CONCERN IS  
WITH TRANSFORMER FLUID FROM A  
W/O TANK.

TRANSPORTATION CENTER

INSPECTION DATE: \_\_\_\_\_  
BY: \_\_\_\_\_  
AFFECTED MEDIA: \_\_\_\_\_  
OTHER: \_\_\_\_\_  
FINAL CLEANUP REPORT  
SITE CHARACTERIZATION  
INTERIM CLEANUP REPORT  
FORM 13-1 (REV. 11/01)

000000

February 7, 1991

Geotechnical,  
Geoenvironmental and  
Geologic Services

Puget Sound Power & Light Company  
P.O. Box 97034  
Bellevue, Washington 98009-9734

Attention: Mr. Gary R. Reid

We are submitting eight copies of our report of remedial action for two underground fuel storage tanks removed at the Renton Service Center in Renton, Washington. Our services were authorized verbally by Mr. Gary Reid of Puget Sound Power & Light Company on September 26, 1990. Our services were performed in accordance with Blanket Contract # 89-BX01074A.

We appreciate the opportunity to be of continued service to PSP&L. Please call if you have any questions regarding this report.

Yours very truly,

GeoEngineers, Inc.



Stephen C. Perrigo  
Associate

CAH:KSK:SCP:ira

File No. 0186-125-B69

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REPORT OF REMEDIAL ACTION  
UNDERGROUND STORAGE TANK REMOVAL  
STORES BUILDING, RENTON SERVICE CENTER  
RENTON, WASHINGTON  
FOR  
PUGET SOUND POWER & LIGHT COMPANY

INTRODUCTION AND SCOPE

This report summarizes the results of our observations during the removal of two underground fuel storage tanks located north of the Stores Building at the PSP&L (Puget Sound Power & Light Company) Renton Service Center in Renton, Washington. The site is located at 620 South Grady Way, as shown on the Vicinity Map, Figure 1. The general layout of the site is shown on the Site Plan, Figure 2.

A subsurface contamination study was previously completed by GeoEngineers in the vicinity of the underground fuel storage tanks. The results of that study were presented to PSP&L in a report titled "Report of Geotechnical Services, Subsurface Contamination Study, Former Renton Transportation Center, Renton, Washington, for Puget Sound Power & Light Company," dated July 26, 1988. Monitor wells MW-1 through MW-4 were installed as part of the 1988 study. Wells MW-1 through MW-3 were abandoned in accordance with current state law on September 26, 1990 prior to tank removal operations. Details of the well abandonment procedures were provided to you in a separate report dated October 18, 1990.

One 10,000-gallon steel gasoline tank and one 1,000-gallon diesel fuel tank were removed from the site on September 27, 1990. These tanks had previously been out of service. PSP&L does not intend to replace these tanks at this location. The tank removal activities took place concurrently with the remedial excavation of hydraulic fluid-contaminated soil in the vicinity of the Stores Building. The remedial activities related to hydraulic fluid contamination will be summarized in a separate report. ✓

The purpose of our services was to observe and evaluate subsurface soil and contaminant conditions in the UST (underground storage tank) excavation, and to assist PSP&L and their contractors with remediation, soil disposal, and excavation backfill activities. GeoEngineers' scope of services completed for this project is listed below.

1. Observe and document the removal and excavation of underground fuel storage tanks and related fuel-contaminated soils.
2. Conduct field screening on soil removed from the tank excavations for evidence of contamination using visual, water sheen and headspace screening methods. These methods are described in Appendix A.
3. Obtain soil samples from the limits of the excavations and from soil stockpiles for chemical analysis to assess concentrations of fuel-related contaminants.
4. Monitor the installation of a dewatering well which was designed to lower the static water table.
5. Test a ground water sample for the presence of petroleum-related contaminants.
6. Coordinate off-site disposal of contaminated soil with the Kitsap County Sanitary Landfill.
7. Evaluate the field and laboratory data with regard to existing regulatory concerns.
8. Monitor and evaluate the placement and compaction of backfill in the excavation after the completion of remedial activities.

#### SOIL EXCAVATION AND SAMPLING

Chempro (Chempro Environmental Services) removed the two underground fuel storage tanks from the locations shown in Figure 2 on September 27, 1990. Both fuel tanks were removed from a single excavation. Soil removed from this excavation was stockpiled temporarily on-site. Excavation activities were completed by October 11, 1990 and the excavation was backfilled with imported fill material. A representative of our staff was present to observe tank removal activities and to obtain soil samples. Messrs. Gary Reid and/or Dave Kramer of PSP&L were also on-site during tank removal and remedial excavation activities.

There was no visible evidence of leakage on the diesel fuel storage tank (Tank #227). Minor pitting and corrosion was observed on the exterior of this tank. Corroded areas up to 1-inch in diameter were observed on the south-facing side of the gasoline tank (Tank #226).

Ground water was encountered at a depth of approximately 8 feet in the excavation for the underground fuel storage tanks. To facilitate removal of contaminated soil, lowering of the ground water level was required.

Chempro installed a dewatering well in the northeastern corner of the excavation to a depth of 16 feet. A water table depression pump was placed at a depth of 15 feet below ground surface inside an 8-inch diameter, slotted stainless steel well casing. Coarse sand, acting as a filter pack, was placed around the well casing. Two piezometers (1-inch PVC with a hydrotip) were installed as observation wells at a depth of 12 feet in the UST excavation. The dewatering well and piezometers were removed prior to backfilling the excavation.

Approximately 2,000 gallons of water were pumped out of the excavation and into a 6,500-gallon Baker Tank between October 5, 1990 and October 11, 1990. A water sample was obtained from the well for chemical analysis of TPH (total petroleum hydrocarbons) by EPA Method 418.1 on October 4, 1990. The test results were submitted to Metro as a requirement prior to disposal in the sanitary sewer. TPH were not detected in this water sample (sample 901004-13). The laboratory report is presented in Appendix B. A copy of the discharge permit is presented in Appendix C. The accumulated waste water was discharged to Metro.

The UST excavation was completed to depths ranging from 8 to 10 feet. Backfill surrounding the underground storage tanks consisted of coal mine spoils (fragmented coal with silt, sand and gravel), silt, silty sand, and sand with silt. Fill, initially placed to bring the site to the current grade, was encountered in the excavation walls and the base of the excavation. This fill is similar to the tank backfill and consists of coal mine spoils, silt, silty sand, and sand with silt.

Field screening was conducted by a GeoEngineers' representative on soil removed from the excavation in order to evaluate areas of potential petroleum-related contamination. Screening results were also used as a basis for selecting soils for chemical analysis. The screening methods used are described in Appendix A. There was no visual evidence of petroleum-related contamination in any of the samples observed. Sheen observations from soil samples obtained from the excavation ranged from no detectable sheen (NS) to a heavy sheen (HS). Vapor concentrations detected during headspace vapor testing ranged from nondetected to 1,200 ppm (parts per million).

Based on field screening results, some petroleum contamination extended eastward from the eastern end of Tank #226. Excavation and soil removal continued in this area until field screening indicated that all residual contamination had been removed.

Thirteen soil samples were obtained from the excavation for chemical analysis between September 27 and October 11, 1990. In addition, three soil samples (samples 901008-2, 901009-17 and 901009-18) were obtained from hand auger borings near a sanitary sewer line along the southern edge of the UST excavation. The sample locations are shown in Figure 3. The soil samples were analyzed for the presence of fuel hydrocarbons by modified EPA Method 8015 and for BETX (benzene, ethylbenzene, toluene, and xylenes) by EPA Method 8020. Analytical results for the soil samples tested from the tank excavation are summarized in Table 1. Laboratory reports for the soil samples are included in Appendix B.

Ecology (Washington State Department of Ecology) has adopted compliance cleanup levels for hazardous substance releases in soil and ground water under the MTCA (Model Toxics Control Act) Regulation. The draft MTCA compliance cleanup levels (July 18, 1990) for soil are listed below. Contaminated soil was removed until contaminant concentrations in samples obtained from the limits of the excavations were less than MTCA cleanup criteria.

<u>Compound</u>	<u>Draft MTCA Soil Compliance Cleanup Levels (mg/kg)</u>
Total Petroleum Hydrocarbons (gasoline)	100
Total Petroleum Hydrocarbons (other)	200
Benzene	0.5
Toluene	40
Ethylbenzene	20
Xylenes	20

Note: mg/kg = milligrams per kilogram

#### SOIL STOCKPILING AND DISPOSAL

Approximately 350 cubic yards of soil was removed from the excavation and temporarily stockpiled on-site. Based on field screening, the soil was separated into contaminated and non-contaminated stockpiles. Approximately

115 cubic yards of noncontaminated soil was placed on plastic sheeting, surrounded by bales of hay, and covered with plastic. Approximately 235 cubic yards of contaminated soil was placed on plastic sheeting; surrounded by Ecology Blocks, and covered with plastic. The non-contaminated soil stockpile was located on a gravel surfaced parking area near the eastern property line. The contaminated soil stockpile was located on asphaltic concrete pavement west of the Stores Building.

GeoEngineers obtained composite soil samples from the contaminated soil stockpile on October 1 and October 4, 1990. Analytical results for the composite soil samples obtained from the contaminated soil stockpile are summarized in Table 2. Laboratory reports for the composite soil samples are included in Appendix B. The composite soil samples obtained from the contaminated soil stockpile were analyzed for TPH (EPA Method 418.1), BETX (EPA Method 8020), and fuel hydrocarbons (modified EPA Method 8015). On behalf of PSP&L, GeoEngineers applied for and received clearance for disposal of the contaminated soil stockpile at the Kitsap County Sanitary Landfill. These soils were transported to the landfill on October 11, 1990.

The non-contaminated soil stockpile was sampled along with other non-contaminated soils that were excavated during the hydraulic fluid remedial operations which are summarized in a separate report. Laboratory reports for the composite samples collected from the non-contaminated soil stockpile are included in that report. Test results of samples obtained from the non-contaminated soil stockpile indicate that contaminant concentrations were less than draft MTCA compliance cleanup levels. These soils were eventually used as backfill inside the Stores Building.

#### BACKFILL

A GeoEngineers' representative was on site to monitor the placement and compaction of backfill in the UST excavation between October 11 and October 16, 1990. Messrs. Gary Reid and/or Dave Kramer of PSP&L were also on-site during backfilling activities. Prior to backfilling, loose soil in the excavation was removed. In accordance with our recommendations, Mirafi 140N filter fabric was placed in the base of the excavation. Crushed rock (1-1/4 inch minus) was placed over the filter fabric from the base of the excavation to a depth of 8 feet (total thickness of about 6 inches to 2 feet). The crushed rock was compacted with a Rammax Trapper sheepsfoot roller. The edges of the filter fabric were folded over to partially

encapsulate the crushed rock. Imported backfill, consisting of fine to medium sand with gravel, was placed in 1-foot lifts and compacted to about 1-foot below the ground surface. Compaction was accomplished with a Rammax Trapper sheepsfoot roller, a hand-operated jumping jack and a Bomag BW1420 vibratory roller. The balance of the excavation was backfilled with crushed rock (5/8-inch minus and 1-1/4-inch minus) and compacted with the vibratory roller.

In-place compaction tests were taken by a GeoEngineers' representative using a nuclear density meter to evaluate the compaction of the backfill. Test results indicate that backfill placed greater than 2 feet below ground surface was compacted in accordance with the specification to at least 90 percent of the maximum dry density as determined by the ASTM D-1557 test procedure. The balance of the backfill was compacted in accordance with the specification to at least 95 percent of the maximum dry density.

During the remedial excavation activities, a 4-inch-diameter concrete utility pipe was exposed along the south side of the excavation approximately 3 feet below the ground surface. A section of the pipe was broken during excavation operations. At the recommendation of PSP&L, the broken section of pipe was repaired with PVC pipe during the backfilling operations.

Daily field reports were maintained by our field representative during the excavation backfill procedures to document our observations and test results. These reports are maintained in our files and are available for review. A summary of our compaction test results is presented in Table 3.

#### CONCLUSIONS

The results of this study indicate that subsurface petroleum-related contamination in the vicinity of the former diesel fuel tank (Tank #227) and the former gasoline tank (Tank #226) has been successfully removed. The remaining soils have fuel hydrocarbon and BETX concentrations that are less than draft MTCA cleanup criteria, based on our sampling and testing. We do not recommend any further remedial actions related to residual fuel contamination in the vicinity of these former underground fuel storage tanks.

It is our opinion that the backfill in the UST excavation was placed and compacted in general accordance with the recommendations presented in

the document titled "Specification for Renton Service Center Garage Area, Remediation of Hydraulic Fluid Leak, Removal of Underground Fuel Storage Tanks and Surface Restoration".

#### LIMITATIONS

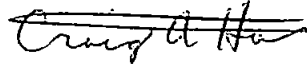
We have prepared this report for use by Puget Sound Power & Light Company. This report may be made available to regulatory agencies. This report is not intended for use by others and the information contained herein is not applicable to other sites. Within the limitations of scope, schedule and budget, our services have been executed in accordance with generally accepted practices in this area at the time the report was prepared. No other conditions, express or implied, should be understood.

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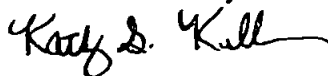
Please contact us if you have any questions regarding this report.

Respectfully submitted,

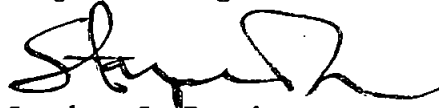
GeoEngineers, Inc.



Craig A. Hart  
Staff Geologist



Kathy S. Killman  
Project Geologist



Stephen C. Perrigo  
Associate

CAH:KSK:SCP:ira

**TABLE 1  
SUMMARY OF SOIL ANALYTICAL DATA  
UST EXCAVATION**

Sample Number	Date Sampled	Depth of Sample (feet)	Sample Location	Field Screening Results(a)		Volatile Aromatic Hydrocarbons(b)				Fuel Hydrocarbons(c) (mg/kg)
				Headspace Vapors (ppm)	Sheen Test	(mg/kg)				
						B	E	T	X	
900927-1	09/27/90	8	West wall of excavation	<100	SS	<0.05	<0.05	<0.05	0.17	<10
900927-2	09/27/90	8	North wall of excavation	<100	SS	<0.05	<0.05	<0.05	<0.05	<10
900927-3	09/27/90	8	South wall of excavation	<100	NS	0.11	0.32	0.20	1.29	<10
900927-4	09/27/90	10	Base of excavation	100	NS	<0.05	<0.05	<0.05	<0.05	<10
900927-5	09/27/90	10	Base of excavation	100	NS	0.15	0.50	0.41	5.96	<10
901004-14	10/04/90	8	North wall of excavation	<100	NS	<0.05	<0.05	<0.05	<0.05	<10
901008-1	10/08/90	Comp.	Base of excavation	<100	NS	--	--	--	--	<10
901008-2	10/08/90	7	Hand Auger Hole	<100	SS	--	--	--	--	<10
901009-17	10/09/90	8.5	Hand Auger Hole	<100	NS	<0.05	<0.05	0.14	0.29	<10
901009-18	10/09/90	8.5	Hand Auger Hole	<100	SS	<0.05	<0.05	<0.05	<0.05	<10
901010-20	10/10/90	8.5	South wall of excavation	<100	NS	<0.05	<0.05	<0.05	<0.05	<10
901010-21	10/10/90	10	Base of excavation	<100	NS	<0.05	<0.05	<0.05	<0.05	<10
901010-22	10/10/90	9	North wall of excavation	200	NS	<0.05	<0.05	<0.05	<0.05	<10
901011-23	10/11/90	8.5	South wall of excavation	<100	SS	<0.05	<0.05	<0.05	<0.05	<10
901011-24	10/11/90	10	Base of excavation	<100	NS	<0.05	<0.05	<0.05	<0.05	<10
901011-25	10/11/90	8.5	East wall of excavation	<100	NS	<0.05	<0.05	<0.05	<0.05	<10

**Notes:**

Chemical analyses conducted by Sound Analytical Services, Inc.

"<" = less than

"--" = not tested

mg/kg = milligrams per kilogram

ppm = parts per million

(a) Field screening methods described in Appendix A.

NS = no sheen, SS = slight sheen

(b) BETX analyzed by EPA method 8020. B = benzene, E = ethylbenzene, T = toluene, X = xylenes.

(c) Fuel hydrocarbons analyzed by modified EPA method 8015.

**TABLE 2  
SUMMARY OF ANALYTICAL DATA  
UST EXCAVATION CONTAMINATED SOIL STOCKPILE**

Sample Number	Date Sampled	Sample Location	Field Screening Results(a)		Volatile Aromatic Hydrocarbons(b) (mg/kg)				Fuel Hydrocarbons(c) (mg/kg)	Total Petroleum Hydrocarbons(d) (mg/kg)
			Headspace Vapors (ppm)	Sheen Test	B	E	T	X		
901001-7	10/01/90	East half of stockpile	<100	SS	<0.05	<0.05	<0.05	1.80	64(e)	70.4
901004-11	10/04/90	West half of stockpile	<100	SS	0.15	1.38	2.66	10.8	89(f)	98.1
901004-12	10/04/90	East half of stockpile	<100	SS	0.59	3.74	4.87	29.9	107(g)	115

**Notes:**

Chemical analyses conducted by Sound Analytical Services, Inc.

"<" = less than

"--" = not tested

ppm = parts per million

mg/kg = milligrams per kilogram

(a) Field screening methods described in Appendix A.

SS = slight sheen, MS = moderate sheen

(b) BETX analyzed by EPA method 8020. B = benzene, E = ethylbenzene, T = toluene, X = xylenes.

(c) Fuel hydrocarbons analyzed by modified EPA method 8015.

(d) Total petroleum hydrocarbons analyzed by EPA method 418.1.

(e) Fuel hydrocarbons quantified as aged gas.

(f) Fuel hydrocarbons quantified as aged gas, diesel and heavy oil.

(g) Fuel hydrocarbons quantified as aged gas and diesel.

**TABLE 3  
SUMMARY OF IN-PLACE COMPACTION TESTS  
UST EXCAVATION BACKFILL**

Test Date	General Location	Feet Below Grade	Field Moisture %	% Compaction	
				Field	Specification
10/15/90	Southeast	4.0	--	97	90
10/15/90	Northeast	4.0	10	92	90
10/15/90	Center	4.0	--	90	90
10/15/90	Southwest	4.0	--	90	90
10/15/90	Northwest	4.0	11	92	90
10/15/90	Southeast	3.0	7	92	90
10/15/90	Northeast	3.0	8	95	90
10/15/90	Center	3.0	--	93	90
10/15/90	Center	3.0	8	93	90
10/15/90	Southwest	3.0	9	92	90
10/15/90	Northwest	3.0	8	94	90
10/15/90	Southeast	2.0	--	97	95
10/15/90	Northeast	2.0	7	96	95
10/15/90	Center	2.0	--	95	95
10/15/90	Center	2.0	9	96	95
10/15/90	Southwest	2.0	8	97	95
10/15/90	Northwest	2.0	10	96	95
10/16/90	Northeast	1.5	--	95	95
10/16/90	Center	1.5	--	94*	95
10/16/90	Center	1.5	--	95	95
10/16/90	Southwest	1.5	--	98	95
10/16/90	Northeast	1.0	--	95	95
10/16/90	Southeast	1.0	8	96	95
10/16/90	Center	1.0	--	97	95
10/16/90	Center	1.0	--	95	95
10/16/90	Southwest	1.0	9	97	95

**Notes:**

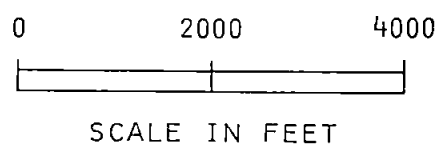
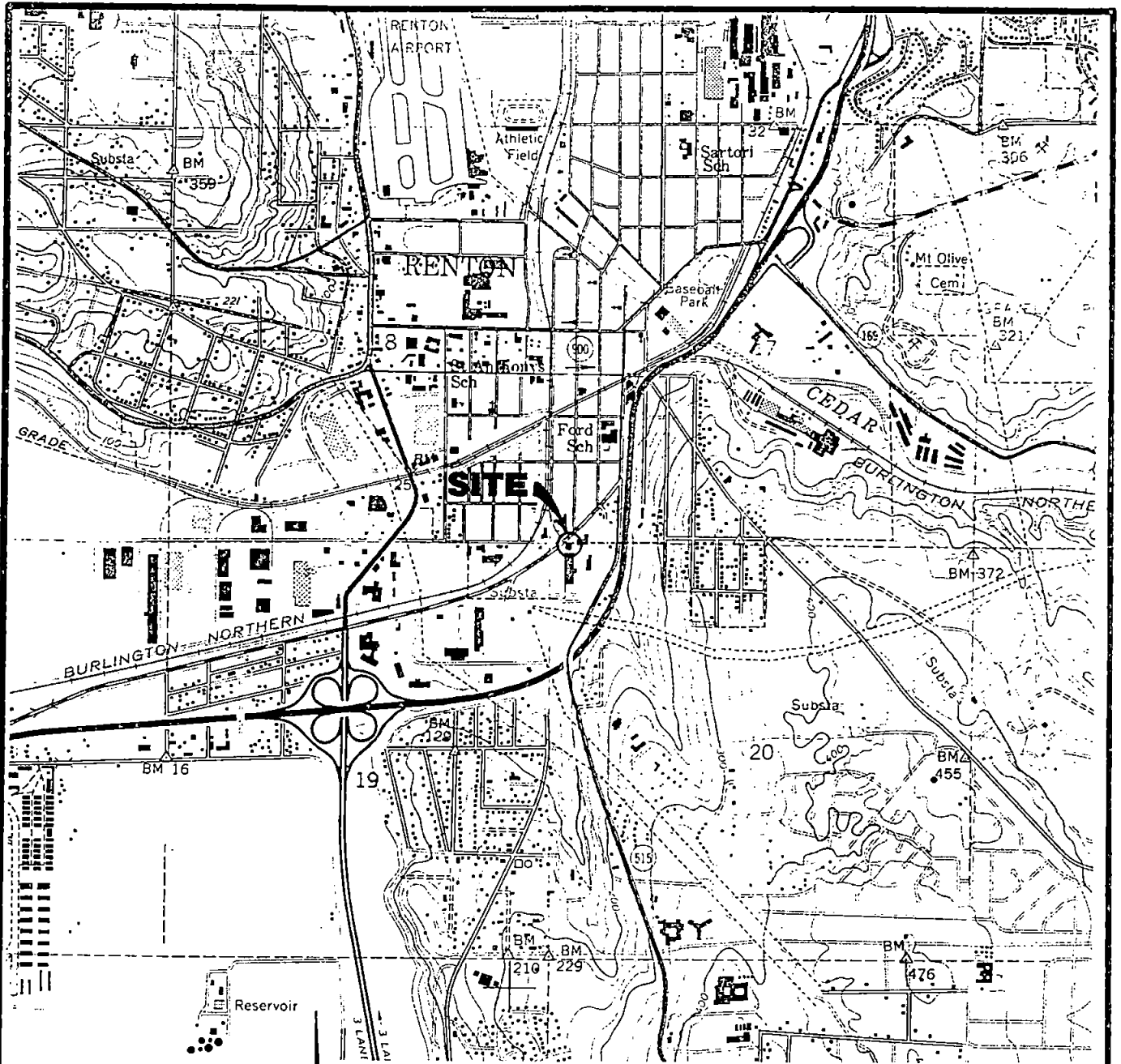
\* Retested after additional compactive effort

"--" = not tested

Tests were performed by a GeoEngineers' representative using a nuclear density meter

A maximum dry density of 129 pounds per cubic foot at a moisture content of 7.5% was determined in accordance with the ASTM D-1557 test procedure as performed on soil sample provided by Chempro

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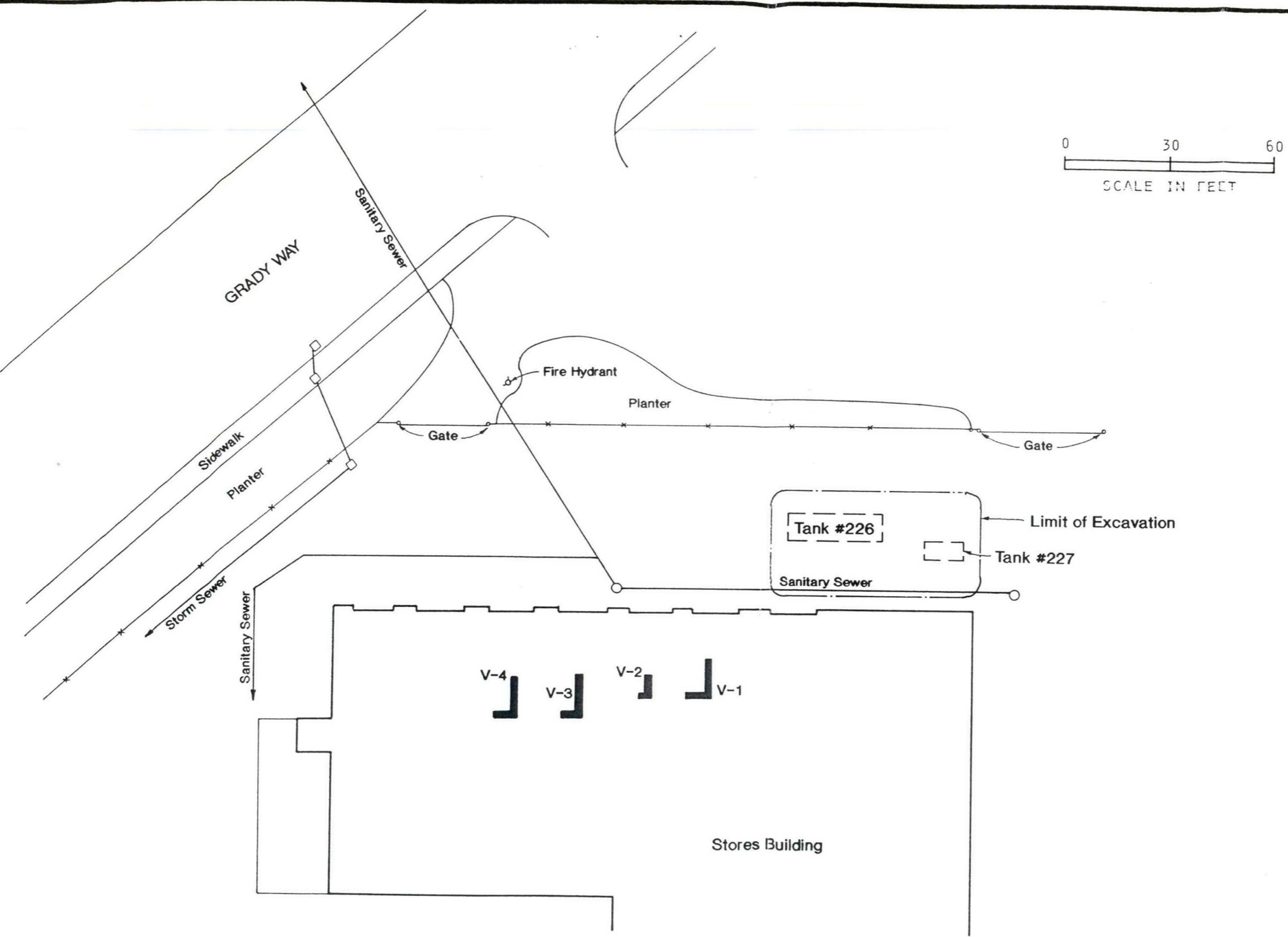
REFERENCE: USGS 7.5' TOPOGRAPHIC QUADRANGLE MAP "RENTON, WASH."



VICINITY MAP

FIGURE 1

06.07.90  
KSK:KKT  
6.20.90  
186.143.B04



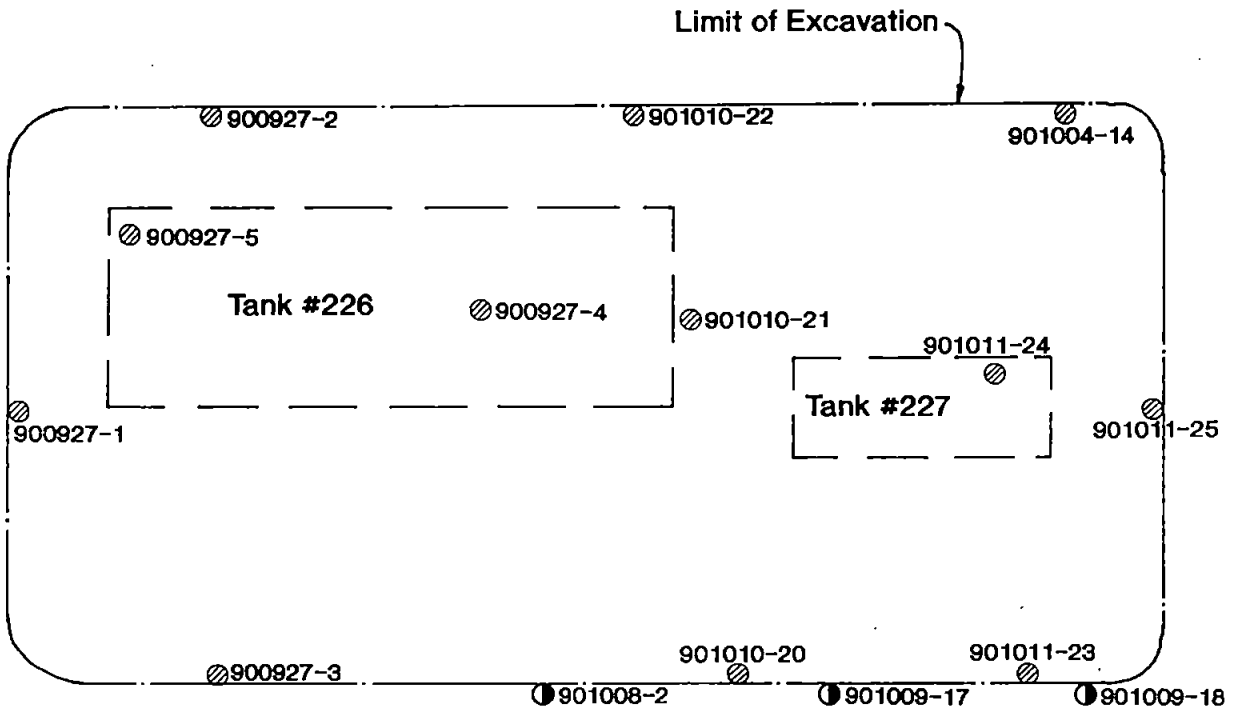
REFERENCE: DRAWING ENTITLED "RENTON TRANSPORTATION CENTER REMODEL", DATED 3/4/74, BY PUGET POWER AND SITE MEASUREMENTS MADE BY GEOENGINEERS, INC.



**SITE PLAN**

**FIGURE 2**

0186-125-B69 CAH:BDH 12.27.90



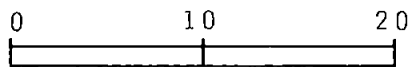
EXPLANATION:

900927-1 ⊗ SOIL SAMPLE LOCATION AND NUMBER

901008-2 ● HAND AUGER LOCATION AND SOIL SAMPLE NUMBER

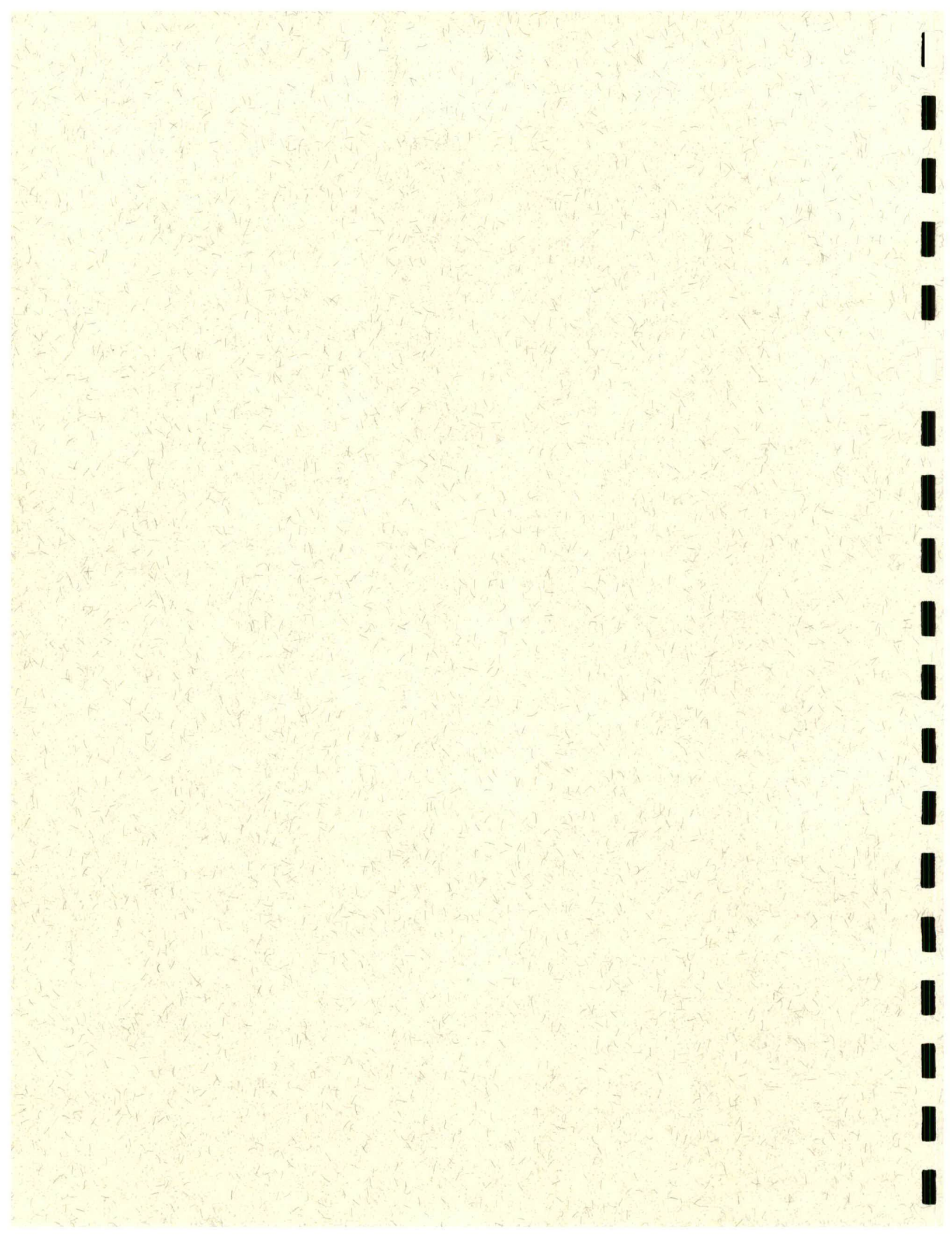
NOTE:

SAMPLE 901008-1 (NOT SHOWN) IS A COMPOSITE SOIL SAMPLE OBTAINED FROM SEVERAL LOCATIONS IN THE BASE OF THE EXCAVATION.



SCALE IN FEET

APPENDIX A



## A P P E N D I X A

### FIELD SCREENING OF SOIL SAMPLES

A GeoEngineers representative conducted field screening on soil samples obtained from the remedial excavation. Field screening results are used as a general guideline to delineate areas of potential petroleum-related contamination in soils. In addition, screening results are used to aid in the selection of soil samples for chemical analysis. The field screening methods employed included: (1) visual examination, (2) sheen testing, and (3) headspace vapor testing using a Bacharach TLV Sniffer calibrated to hexane. The results of headspace and sheen screening are included in Tables 1 and 2 in the text of this report.

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. Sheen screening and headspace vapor screening are more sensitive methods which have been effective in detecting residual petroleum hydrocarbons at concentrations less than draft MTCA cleanup criteria.

Sheen testing involves placing soil in water and observing the water surface for signs of sheen. Because of its sensitivity, the sheen method was first tested on soils obtained from a portion of the site believed to be clean and unaffected by residual petroleum hydrocarbons. The results of the sheen tests on these soils were established as the background level of sheen for the site.

Sheens are classified as follows:

NS - No Sheen	No visible sheen on water surface. Note: background soil samples at the site were classified NS.
SS - Slight Sheen	Light colorless film, spotty to globular; spread is irregular, not rapid; areas of no sheen remain; film dissipates rapidly.
MS - Moderate Sheen	Light to heavy film, may have some color or iridescence, globular to stringy; spread is irregular to flowing.

HS - Heavy Sheen

Heavy colorful film with iridescence; stringy, spread is rapid, sheen flows off the sample; most of water surface is covered.

Headspace vapor screening involves placing a soil sample in a plastic sample bag. Air is captured in the bag and the bag is shaken to expose the soil to the air trapped in the bag. The probe of a Bacharach TLV Sniffer is used to puncture the bag and the TLV Sniffer records the concentrations of combustible vapor in the sample headspace. The TLV Sniffer records concentrations in parts per million (ppm) and is calibrated to hexane. The lower threshold of significance for the TLV Sniffer in this application is 100 ppm (1 percent of the lower explosive limit of hexane). There is no direct relation between TLV vapor measurements and results that could be obtained by chemical analysis of a soil sample. Similar to sheen testing, background vapor levels were established using on-site soils which were not believed to be contaminated. Background vapor levels were less than 100 ppm at this site.

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

#### CHEMICAL ANALYTICAL PROGRAM

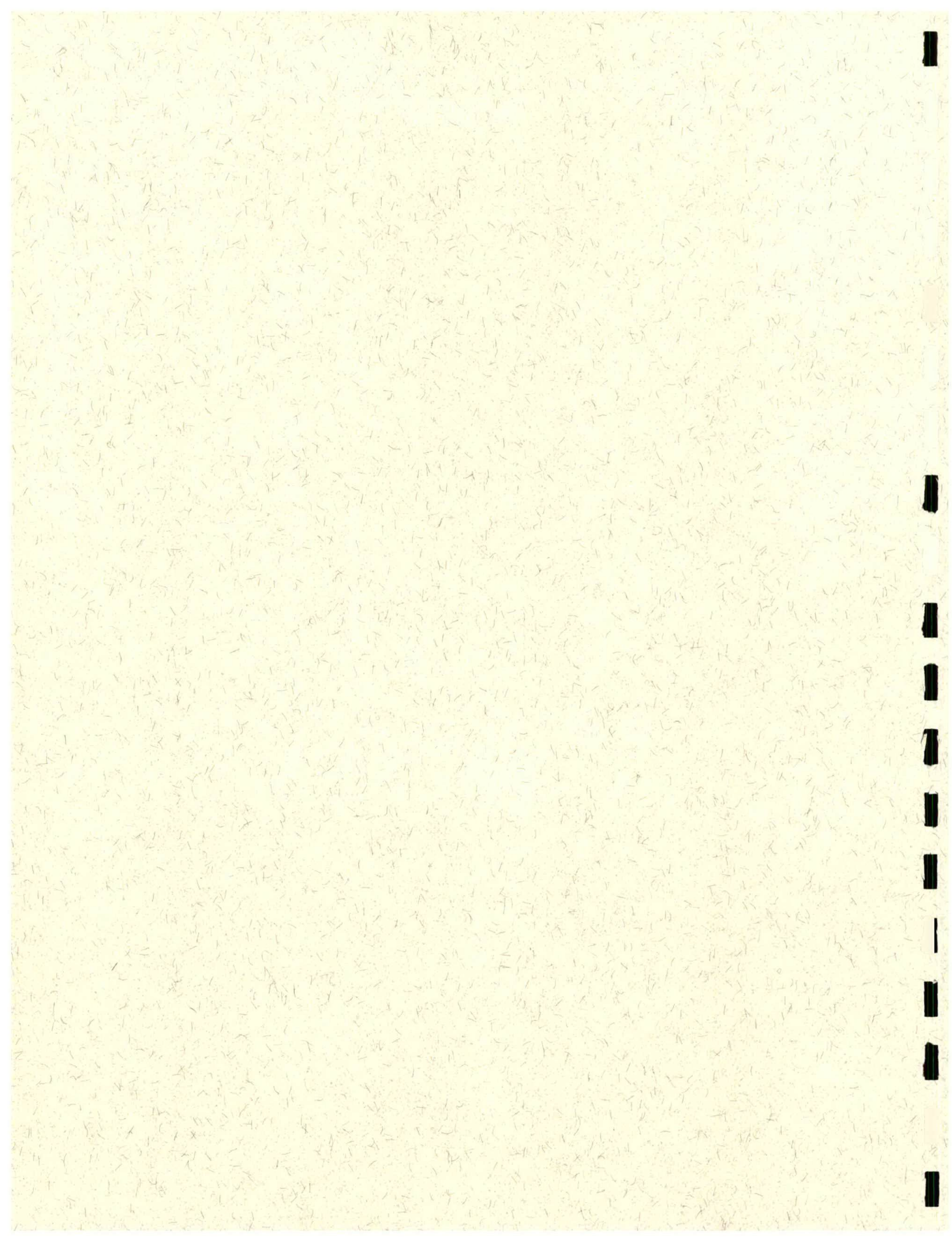
Soil samples obtained between September 27 and October 11, 1990 were analyzed by Sound Analytical Services, Inc. The soil samples were analyzed for one or more of the following compounds: TPH using infrared spectrophotometry methods in accordance with EPA Method 418.1; BETX using gas chromatography/photoionization detection in accordance with EPA Method 8020; and for fuel hydrocarbons using gas chromatography/flame ionization detection in accordance with modified EPA Method 8015.

The water sample obtained from the dewatering well on October 1, 1990 was analyzed by Analytical Technologies, Inc. The water sample was analyzed for TPH using infrared spectrophotometry methods in accordance with EPA Method 418.1.

Chain-of-custody procedures were observed in transporting the soil and ground water samples to the analytical laboratory. The soil analytical data are summarized in Tables 1 and 2 in the text of this report. The laboratory

are summarized in Tables 1 and 2 in the text of this report. The laboratory reports for the soil and ground water samples are presented in Appendix B. The laboratory reports contain the analytical results, quality control data, chromatograms (for modified EPA method 8015 analysis), and the chain-of-custody form.

APPENDIX B



A P P E N D I X B

Index

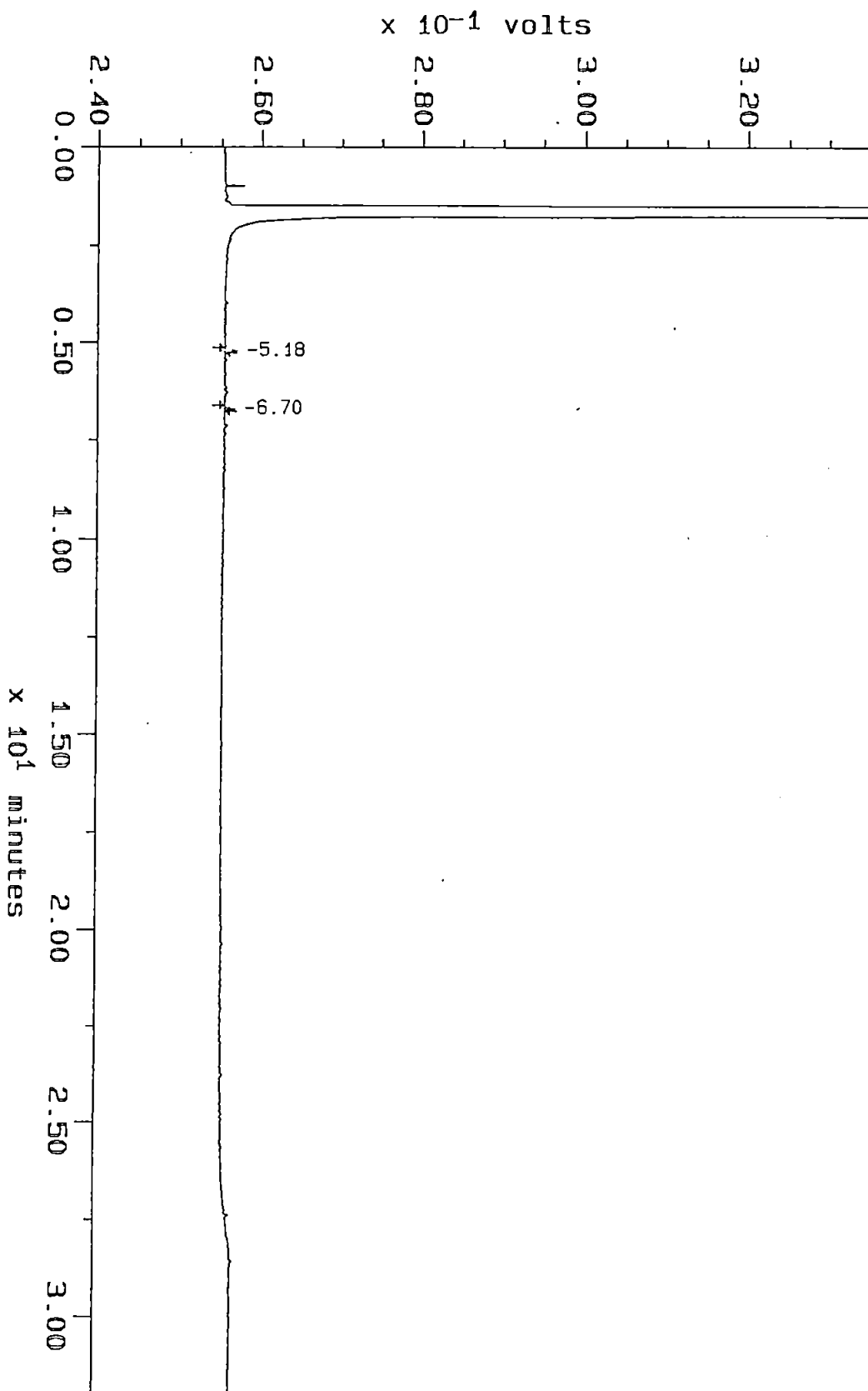
<u>Laboratory and I.D. No.</u>	<u>Contents</u>	<u>Pages</u>
Sound Analytical No. 13588	Analytical results (EPA 8015(modified)/BETX 8020) on soil samples (900927-1 through 900927-5) from Tank #226 & 227 excavation.	B-1 thru B-12
Sound Analytical No. 13642	Analytical results (EPA 418.1/8015(modified)/BETX 8020) on soil samples (901001-6 and 901001-7) from the contaminated soil stockpile.	B-13 thru B-20
Sound Analytical No. 13711	Analytical results (EPA 418.1/8015(modified)/BETX 8020) on soil samples (901004-11, 901004-12, and 901004-14) from the contaminated soil stockpile and the Tank No. 226 & 227 excavation.	B-21 thru B-28
Sound Analytical No. 13778	Analytical results (EPA 8015(modified)) on soil samples (901008-1 and 901008-2) from Tank No. 226 & 227 excavation.	B-29 thru B-36
Sound Analytical No. 13799	Analytical results (EPA 8015(modified)/BETX 8020) on soil samples (901009-17 and 901009-18) from hand auger borings along southern edge of Tank No. 226 & 227 excavation.	B-37 thru B-43
Sound Analytical No. 13845	Analytical results (EPA 8015(modified)/BETX 8020) on soil samples (901010-21 through 901010-22) from Tank No. 226 & 227 excavation.	B-44 thru B-52
Sound Analytical No. 13849	Analytical results (EPA 8015(modified)/BETX 8020) on soil samples (901011-23 through 901011-25) from Tank No. 226 & 227 excavation.	B-53 thru B-62
ATI No. 9010-053	Analytical results (EPA 418.1) on a water sample (901001-13) from dewatering well in Tank #226 & 227 excavation.	B-63 thru B-68



Sample: 13588-5  
Acquired: 29-SEP-90 8:30  
Dilution: 1 : 10.000

Channel: detector 1  
Method: C:\MAX\DATA4\8015  
Amount: 9.558

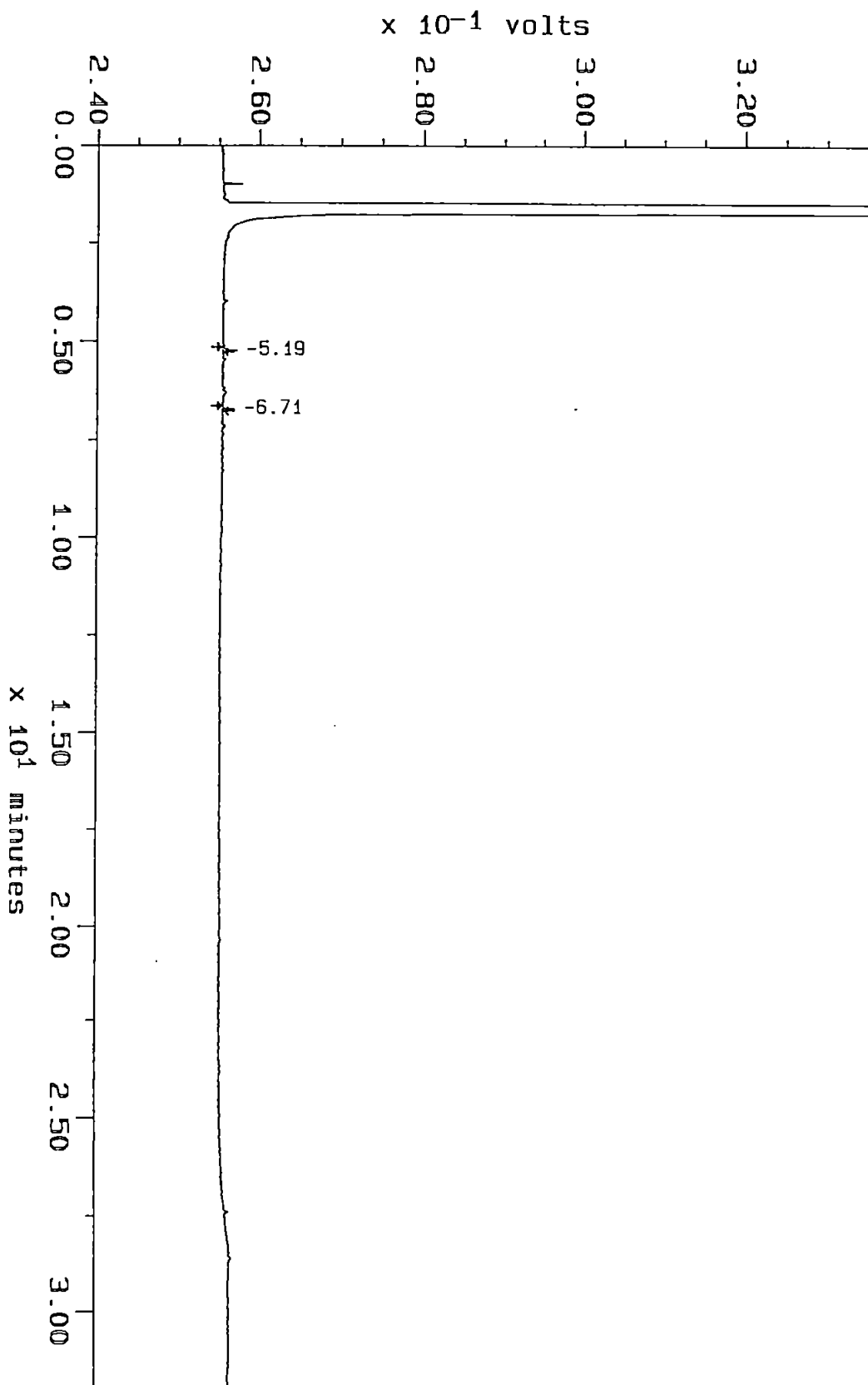
Filename: 13588-5  
Operator:



Sample: 13588-5D  
Acquired: 29-SEP-90 9:16  
Dilution: 1 : 10.000

Channel: detector 1  
Method: C:\MAX\DATA4\8015  
Amount: 9.615

Filename: 13588-5D  
Operator:







# SOUND ANALYTICAL SERVICES, INC.

SPECIALIZING IN INDUSTRIAL & TOXIC WASTE ANALYSIS

4630 PACIFIC HIGHWAY EAST, SUITE B-14, TACOMA, WASHINGTON 98424 - TELEPHONE (206)922-2310 - FAX (206)922-5047

Report To: GeoEngineers, Inc.

Date: October 3, 1990

Report On: Analysis of Soil

Lab No.: 13642

IDENTIFICATION:

Samples Received on 10-02-90

Project: 0186-125-B69 Renton PSPL

ANALYSIS:

Lab Sample No.	RUSH 1	RUSH 2
Client Identification	901001-6	901001-7
Matrix/Units	Soil ppm	Soil ppm
Benzene	< 0.05	< 0.05
Toluene	0.09	< 0.05
Ethyl Benzene	< 0.05	< 0.05
Xylenes	1.54	1.80
BTEX by EPA SW-846 Method 8020		
Total Petroleum Hydrocarbons by EPA Method 418.1	59.1	70.4
Total Petroleum Fuel Hydrocarbons by EPA SW-846 Modified Method 8015	57	64
TPH as	Aged Gas	Aged Gas

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C. LARRY ZURAW

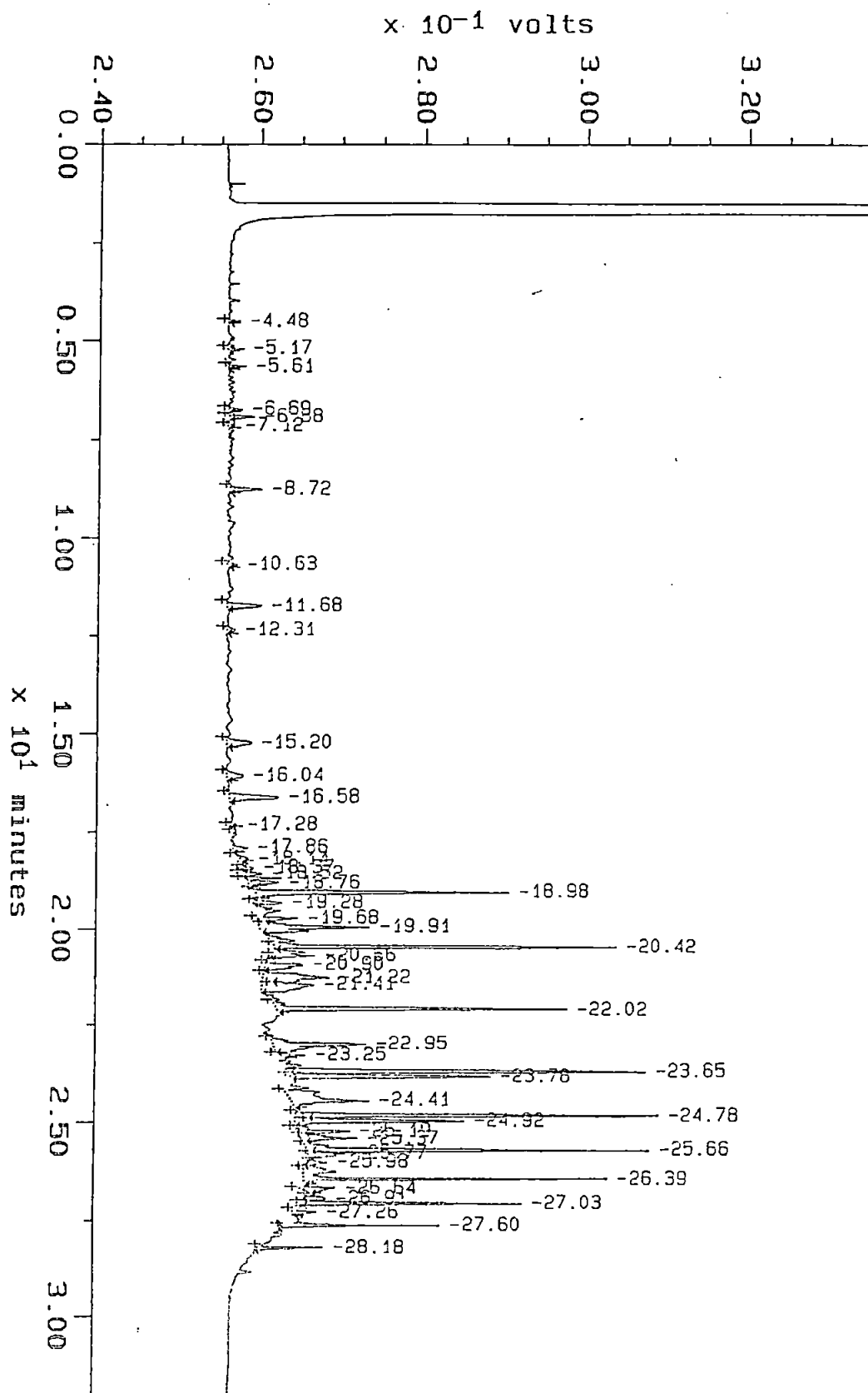
This report is issued solely for the use of the person or company to whom it is addressed. This laboratory accepts responsibility only for the due performance of analysis in accordance with industry acceptable practice. In no event shall Sound Analytical Services, Inc. or its employees be responsible for consequential or special damages in any kind or in any amount.



Sample: 1000DIE  
Acquired: 29-SEP-90 10:03

Channel: detector 1  
Method: C:\MAX\DATA4\8015

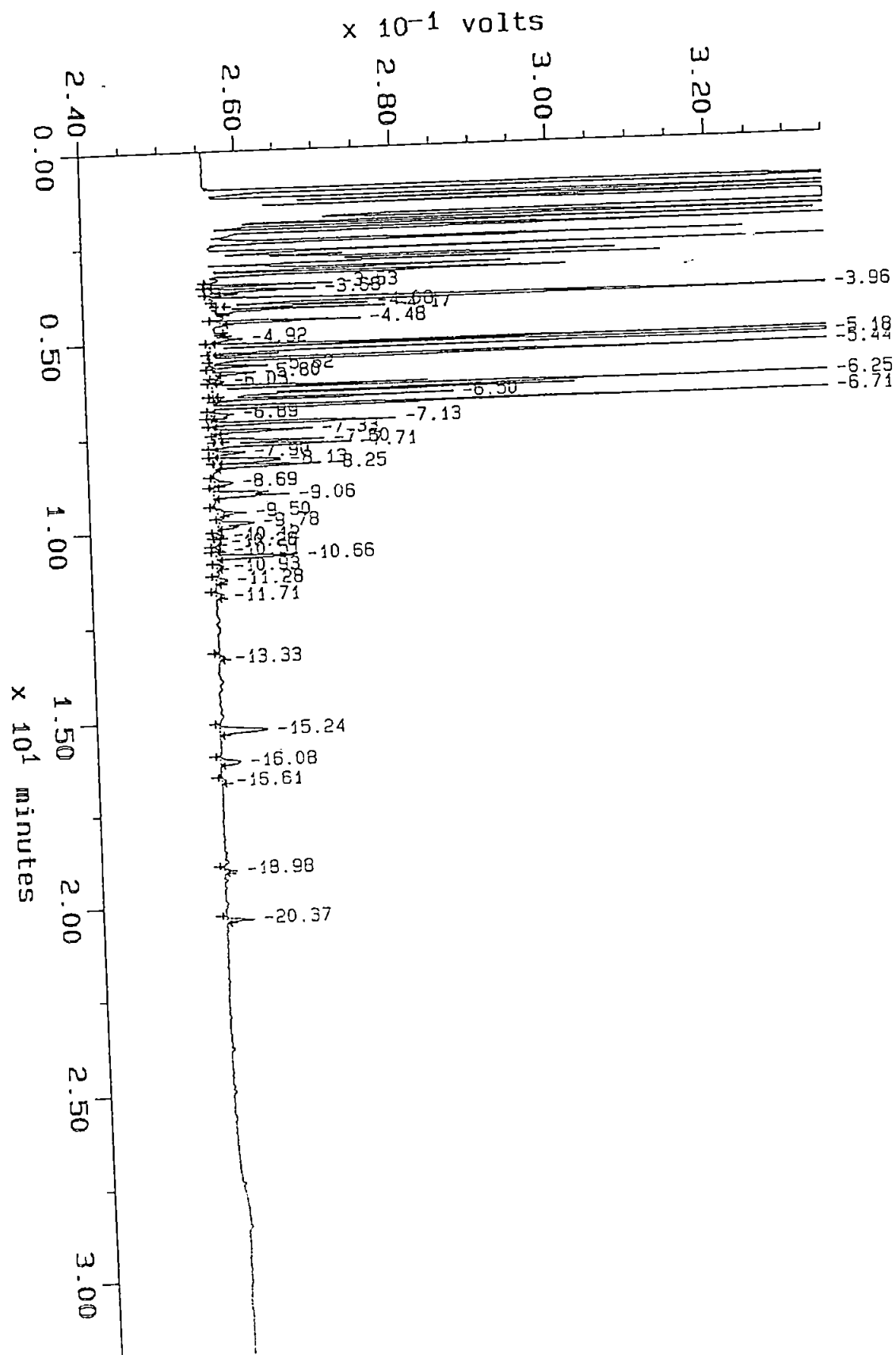
Filename: 100002  
Operator:

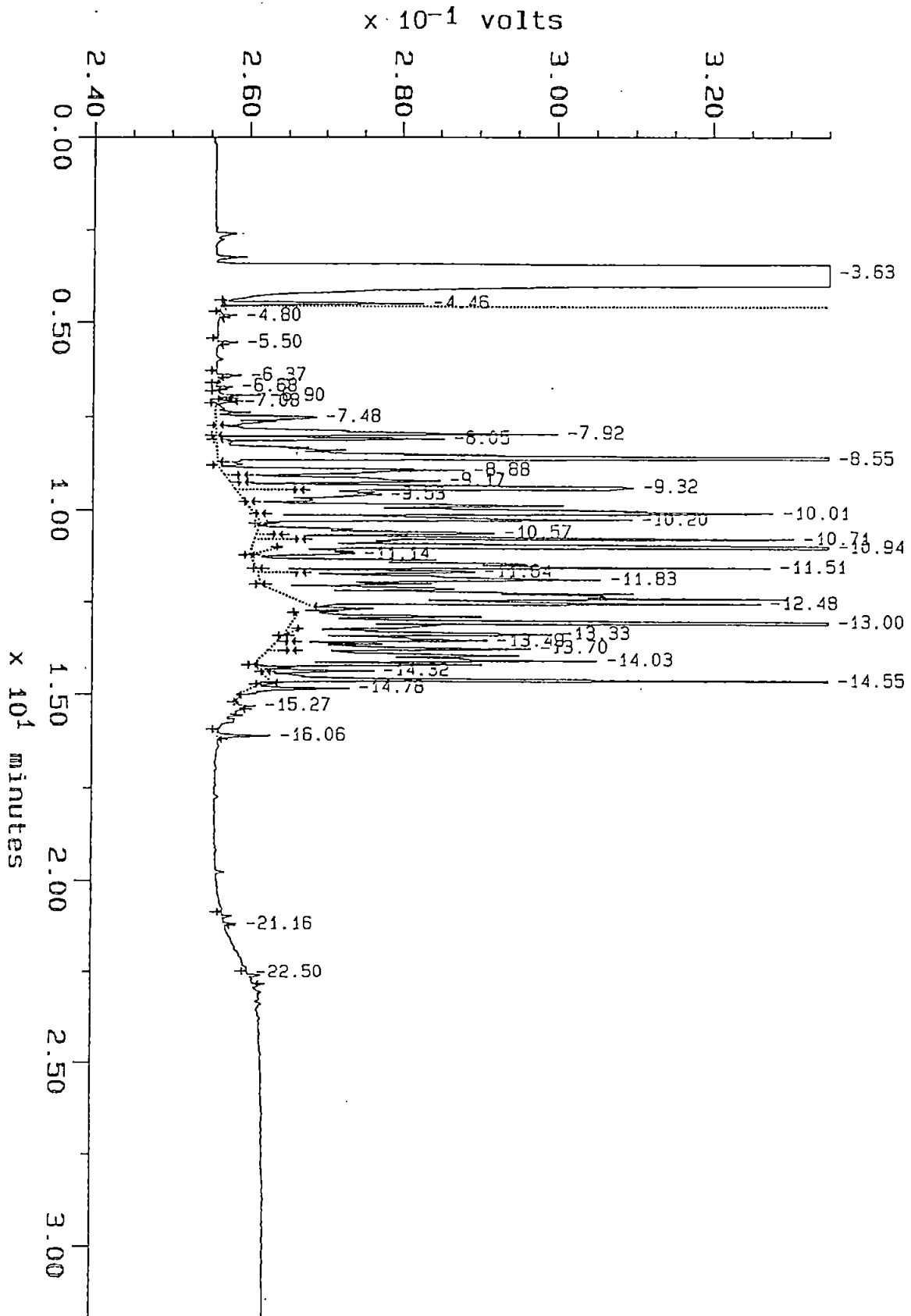


Sample: 1000GAS  
Acquired: 29-SEP-90 4:38

Channel: detector 1  
Method: C:\MAX\DATA4\8015

Filename: 100062  
Operator:



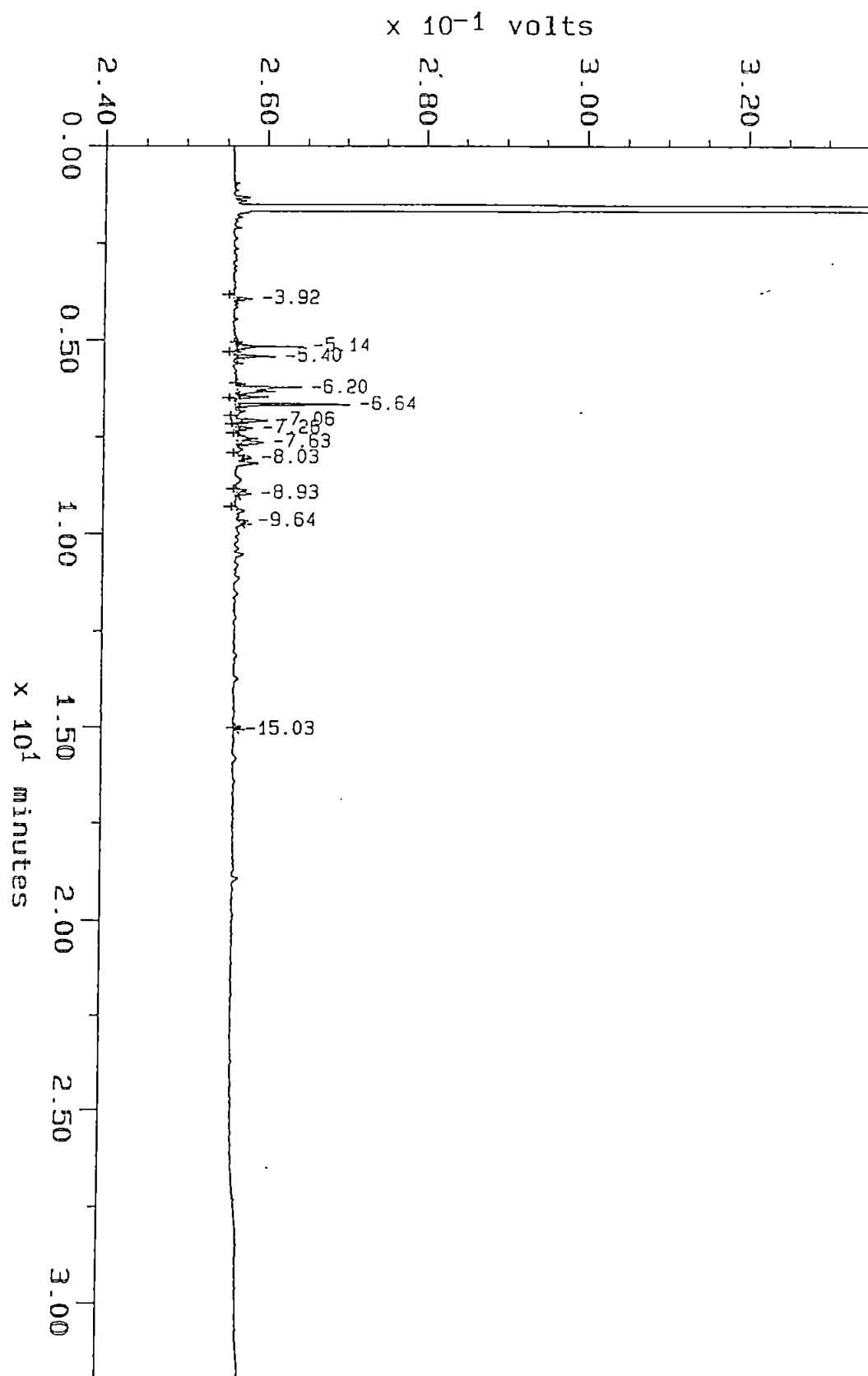




Sample: 13642-2  
Acquired: 03-OCT-90 0:50  
Dilution: 1 : 10.000

Channel: detector 1  
Method: C:\MAX\DATA4\8015D  
Amount: 9.533

Filename: 13642-2  
Operator:





# SOUND ANALYTICAL SERVICES, INC.

SPECIALIZING IN INDUSTRIAL & TOXIC WASTE ANALYSIS

4630 PACIFIC HIGHWAY EAST, SUITE B-14, TACOMA, WASHINGTON 98424 - TELEPHONE (206)922-2310 - FAX (206)922-5047

Report To: GeoEngineers, Inc.

Date: October 8, 1990

Report On: Analysis of Soil

Lab No.: 13711

IDENTIFICATION:

Samples Received on 10-04-90

Project: 0186-125-B69 Renton PSPL

ANALYSIS:

Lab Sample No.	RUSH 1	RUSH 2	RUSH 3
Client Identification	901004 -11	901004 -12	901004 -14
Matrix/Units	Soil ppm	Soil ppm	Soil ppm
Benzene	0.15	0.59	< 0.05
Toluene	1.38	3.74	< 0.05
Ethyl Benzene	2.66	4.87	< 0.05
Xylenes	10.8	29.9	< 0.05
BTEX by EPA SW-846 Method 8020			
Total Petroleum Hydrocarbons by EPA Method 418.1	98.1	115	NT
Total Petroleum Fuel Hydrocarbons by EPA SW-846 Modified Method 8015	89	107	< 10
TPH as	Aged Gas - Diesel - Heavy Oil	Aged Gas - Diesel	

NT - Not Tested.

SOUND ANALYTICAL SERVICES

*C. Larry Zuraw*  
C. LARRY ZURAW

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SPECIALIZING IN INDUSTRIAL & TOXIC WASTE ANALYSIS

4630 PACIFIC HIGHWAY EAST, SUITE B-14, TACOMA, WASHINGTON 98424 - TELEPHONE (206)922-2310 - FAX (206)922-5047

## QUALITY CONTROL REPORT

### DUPLICATES

Lab No: 13711  
Date: October 8, 1990  
Client: GeoEngineers, Inc.

Client ID: 901004-14  
Matrix: Soil  
Units: ppm

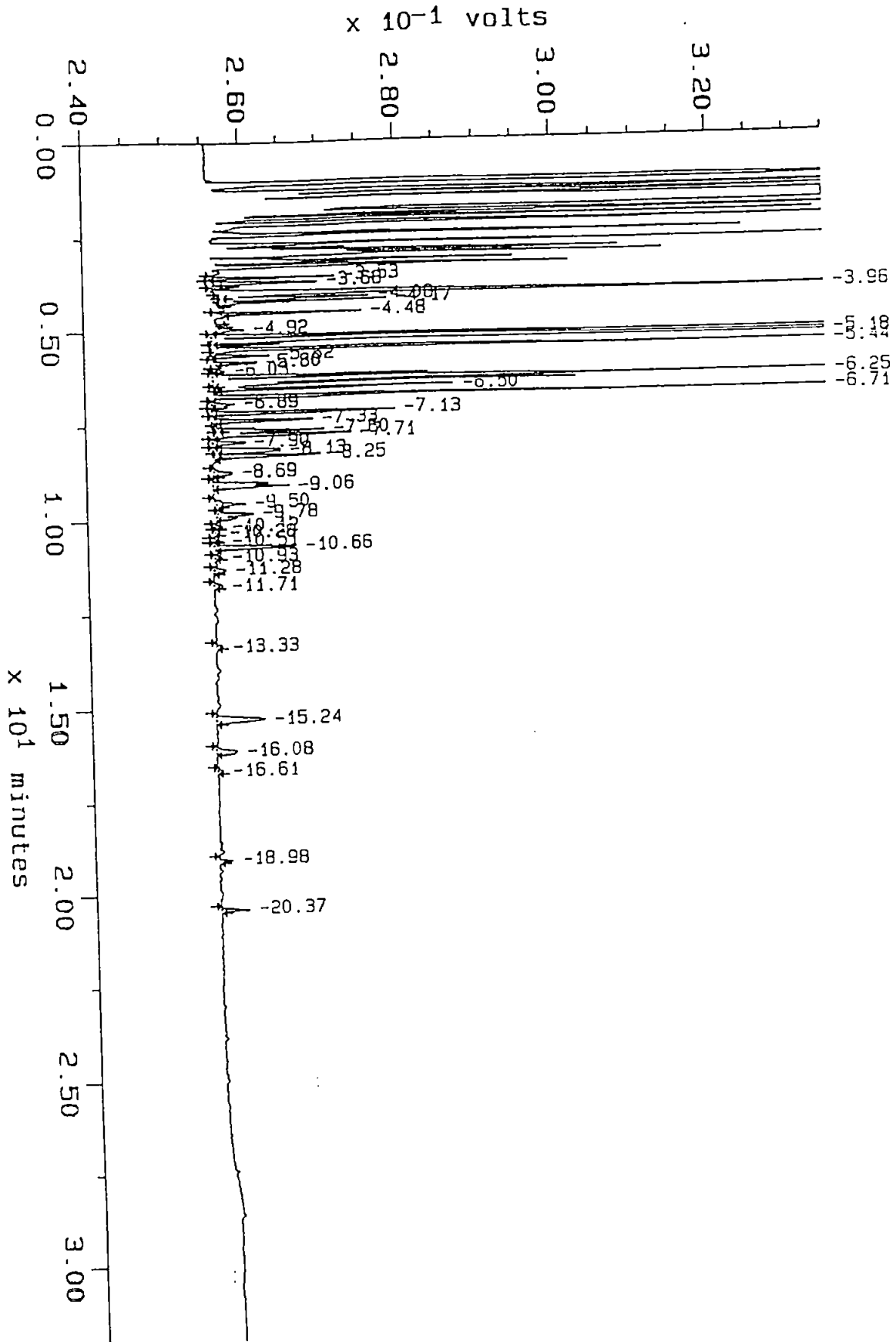
Compound	Sample(S)	Duplicate(D)	RPD*	
Benzene	< 0.05	< 0.05	----	
Toluene	< 0.05	< 0.05	----	
Ethyl Benzene	< 0.05	< 0.05	----	
Xylenes	< 0.05	< 0.05	----	
Total Petroleum Fuel Hydrocarbons	< 10	< 10	----	

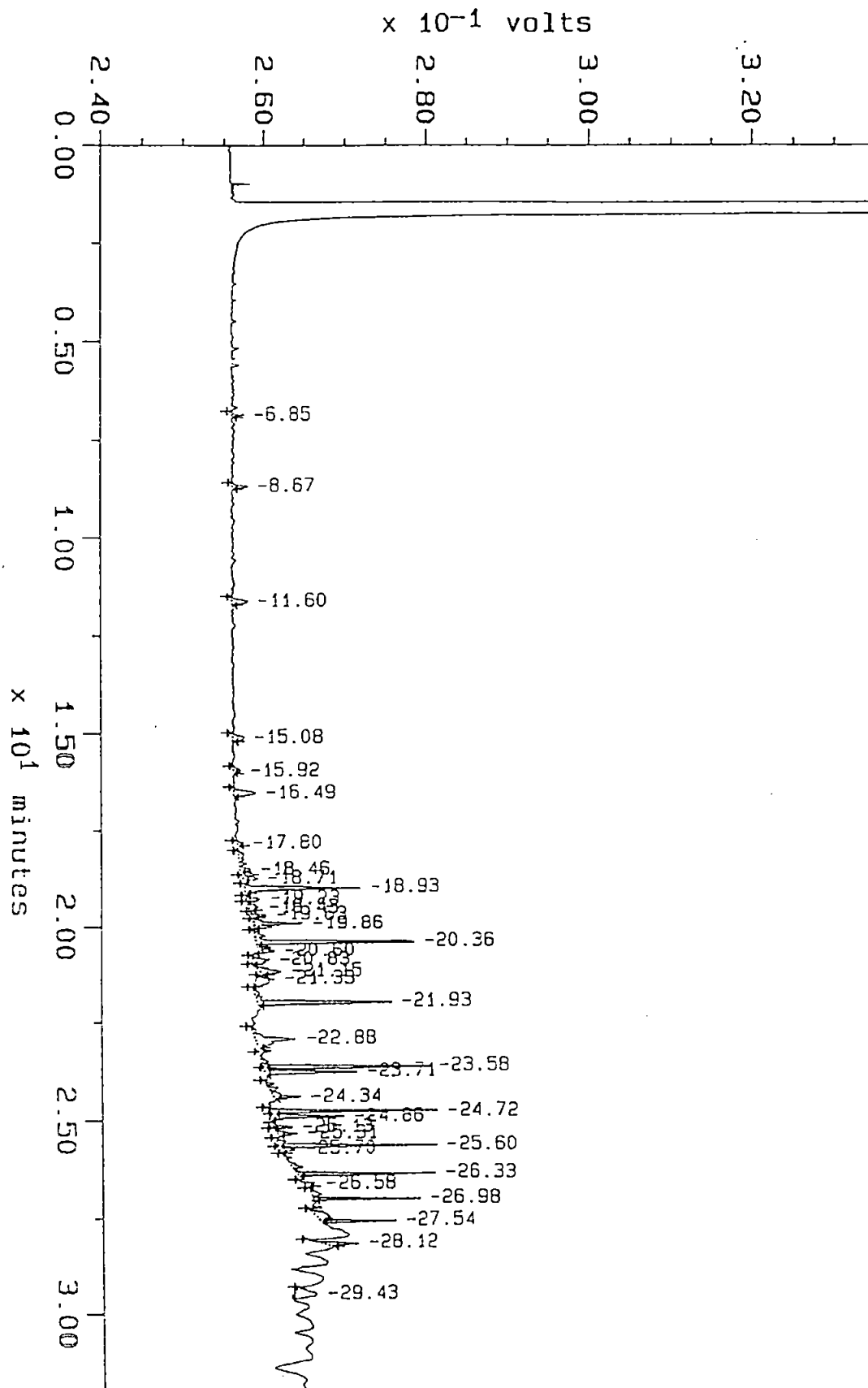
\*RPD = relative percent difference  
=  $[(S - D) / ((S + D) / 2)] \times 100$

Sample: 1000GAS  
Acquired: 29-SEP-90 4:38

Channel: detector 1  
Method: C:\MAX\DATA4\8015

Filename: 1000G2  
Operator:

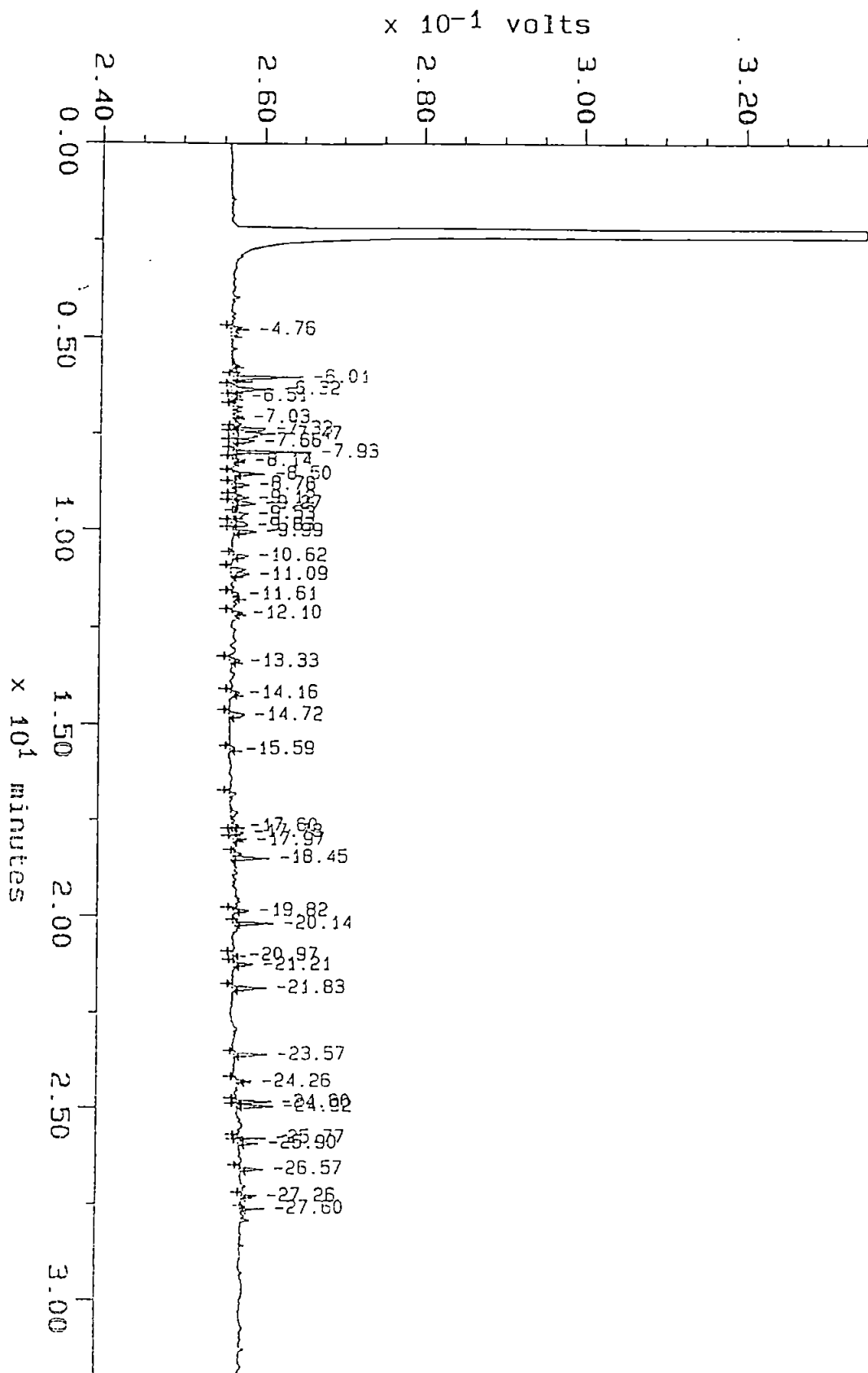




Sample: 13711-2  
Acquired: 08-OCT-90 8:43  
Dilution: 1 : 10.000

Channel: detector 1  
Method: C:\MAX\DATA4\8015  
Amount: 9.600

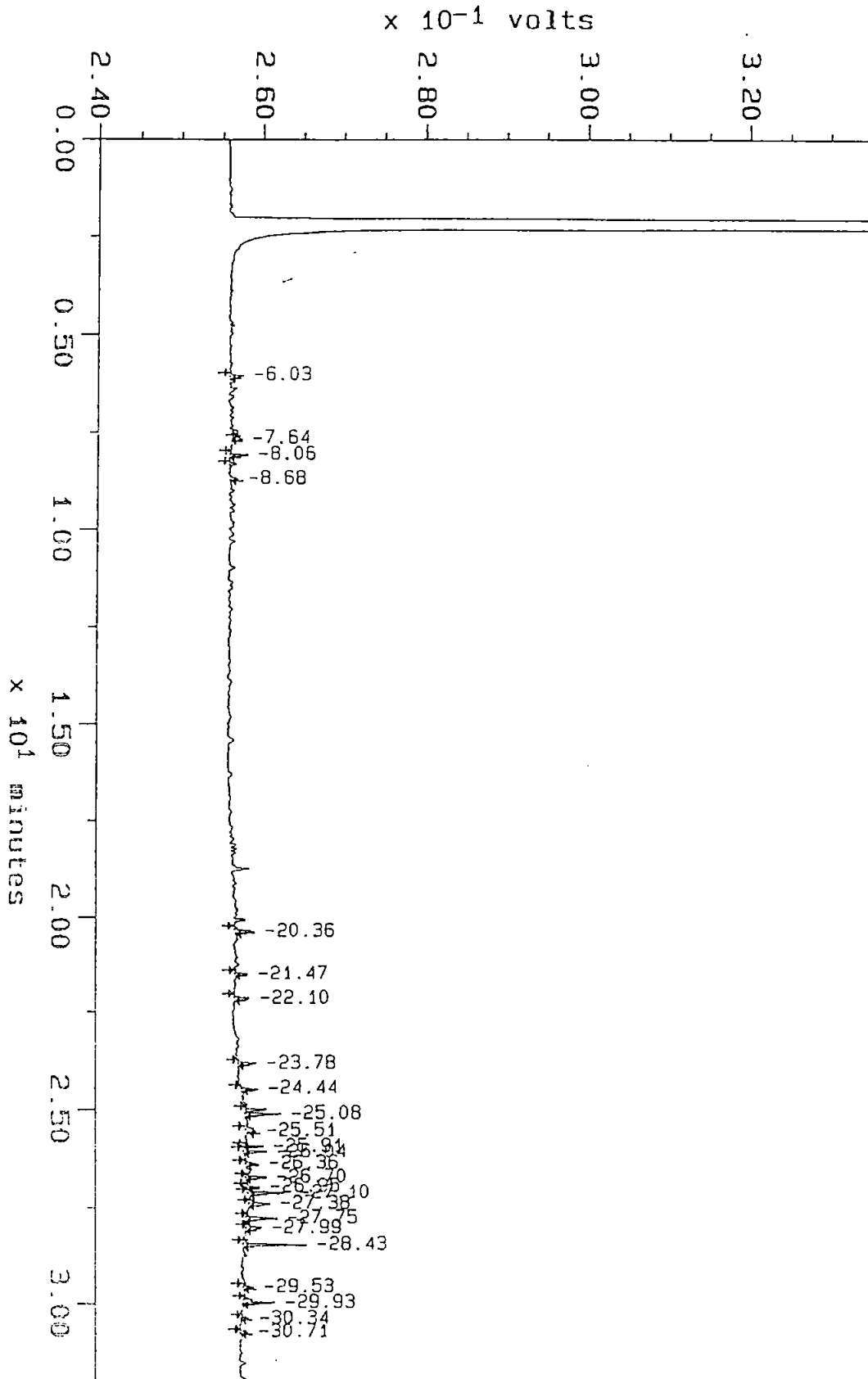
Filename: 13711-2R  
Operator:



Sample: 13711-1  
Acquired: 08-OCT-90 8:00  
Dilution: 1 : 10.000

Channel: detector 1  
Method: C:\MAX\DATA4\8015  
Amount: 9.077

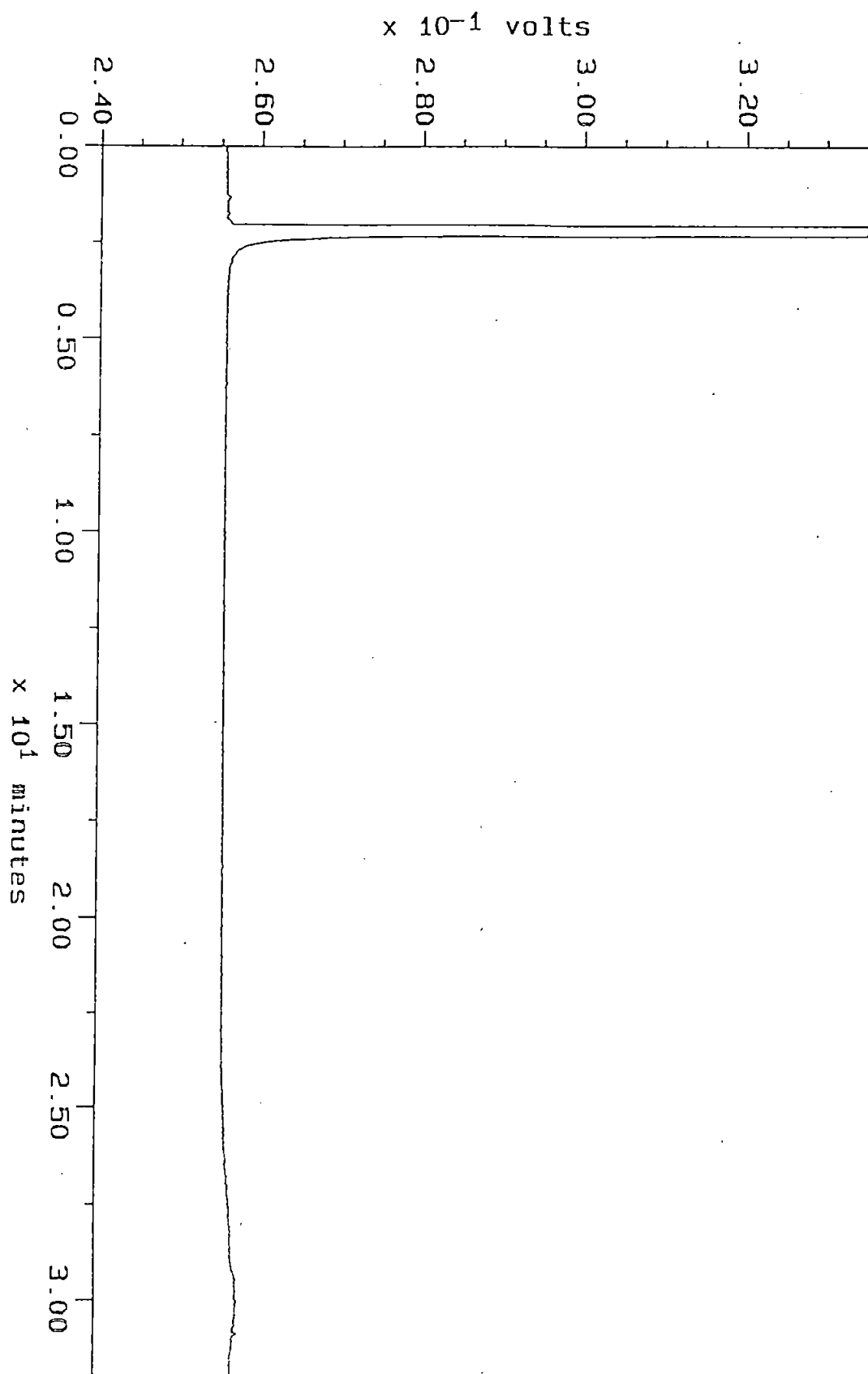
Filename: 13711-1R  
Operator:



Sample: 13711-3  
Acquired: 08-OCT-90 9:26  
Dilution: 1 : 10.000

Channel: detector 1  
Method: C:\MAX\DATA4\8015  
Amount: 9.754

Filename: 13711-3R  
Operator:





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SPECIALIZING IN INDUSTRIAL & TOXIC WASTE ANALYSIS

4630 PACIFIC HIGHWAY EAST, SUITE B-14, TACOMA, WASHINGTON 98424 - TELEPHONE (206)922-2310 - FAX (206)922-5047

Report To: GeoEngineers

Date: October 9, 1990

Report On: Analysis of Soil

Lab No.: 13778

IDENTIFICATION:

Samples Received on 10-8-90

Project: 0186-125-B04 Renton

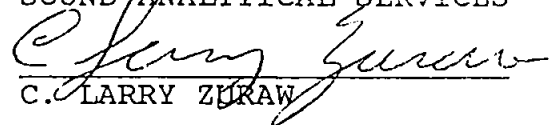
Gett  
OCT 11 1990  
KSK

ANALYSIS:

<u>Lab Sample No.</u>	<u>Client ID</u>	<u>*Total Petroleum Fuel Hydrocarbons, ppm</u>
RUSH 1	901008-1	< 10
RUSH 2	901008-2	< 10

\*TPH by EPA SW-846 Modified Method 8015

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C. LARRY ZERAW

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SPECIALIZING IN INDUSTRIAL & TOXIC WASTE ANALYSIS

4630 PACIFIC HIGHWAY EAST, SUITE B-14, TACOMA, WASHINGTON 98424 - TELEPHONE (206)922-2310 - FAX (206)922-5047

## QUALITY CONTROL REPORT

### DUPLICATES

Lab No: 13778  
Date: October 9, 1990  
Client: GeoEngineers

Client ID: 901008-2  
Matrix: Soil  
Units: ppm

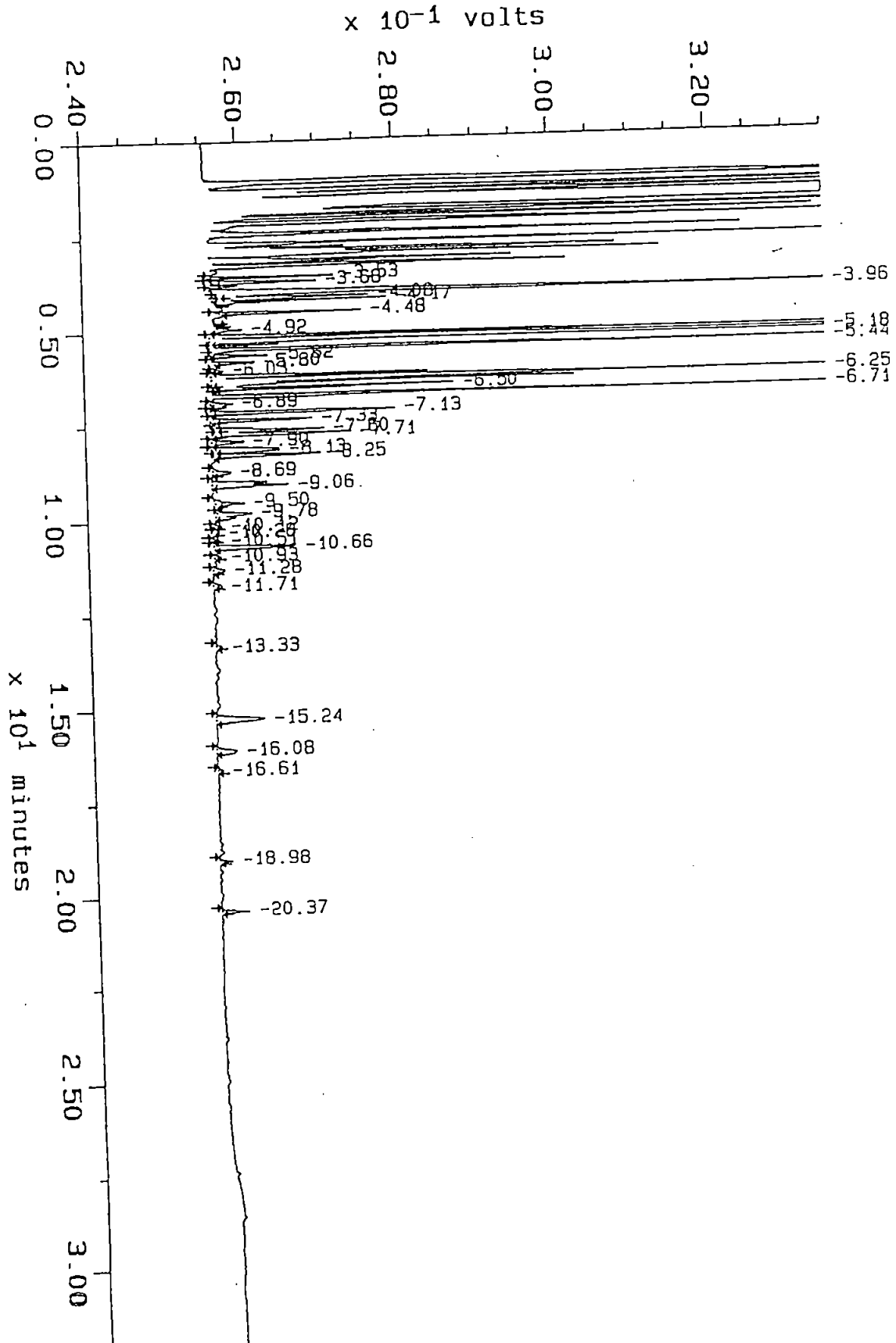
Compound	Sample(S)	Duplicate(D)	RPD*	
Total Petroleum Fuel Hydrocarbons	< 10	< 10	---	

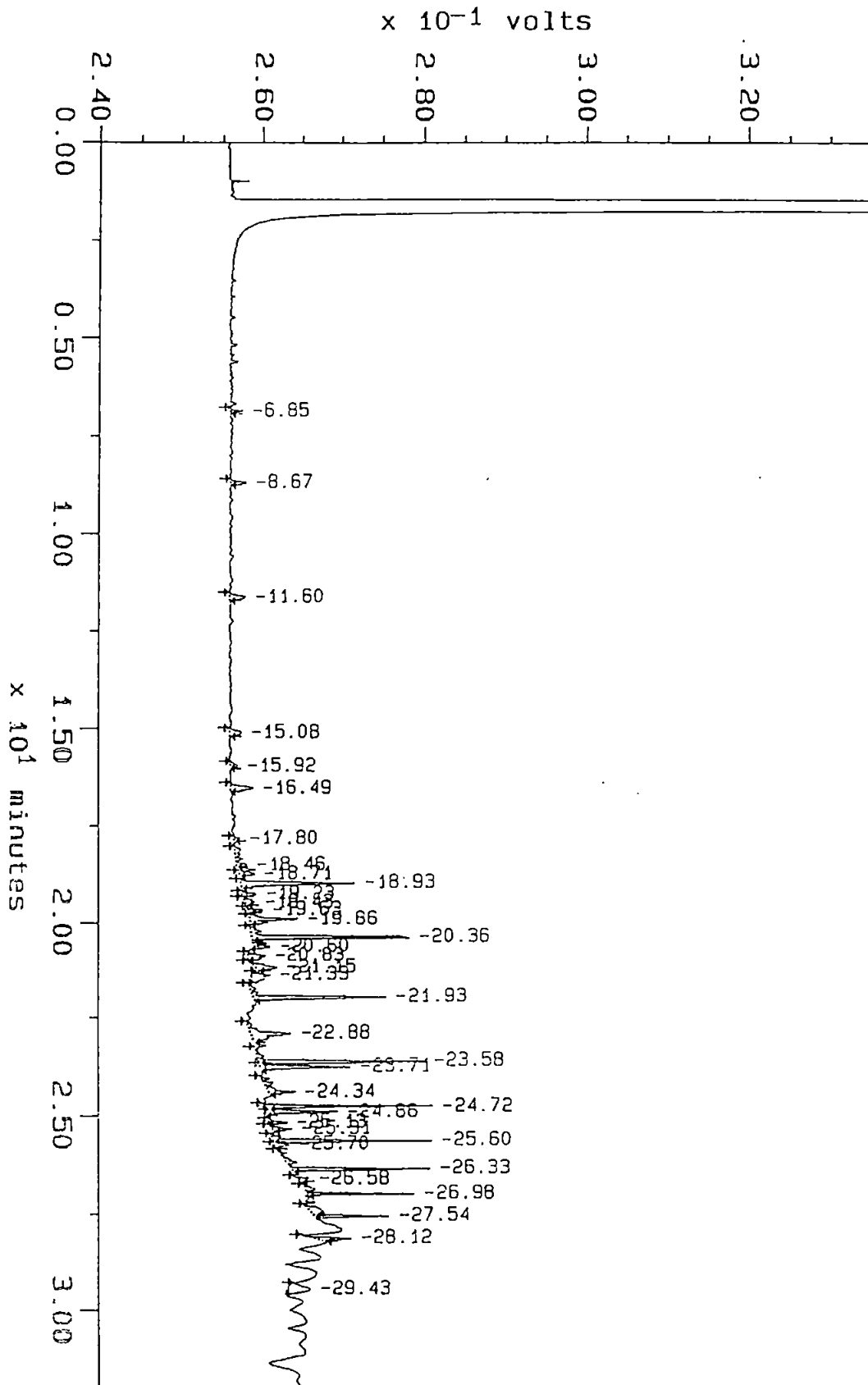
\*RPD = relative percent difference  
=  $[(S - D) / ((S + D) / 2)] \times 100$

Sample: 1000GAS  
Acquired: 29-SEP-90 4: 38

Channel: detector 1  
Method: C:\MAX\DATA4\8015

Filename: 100062  
Operator:

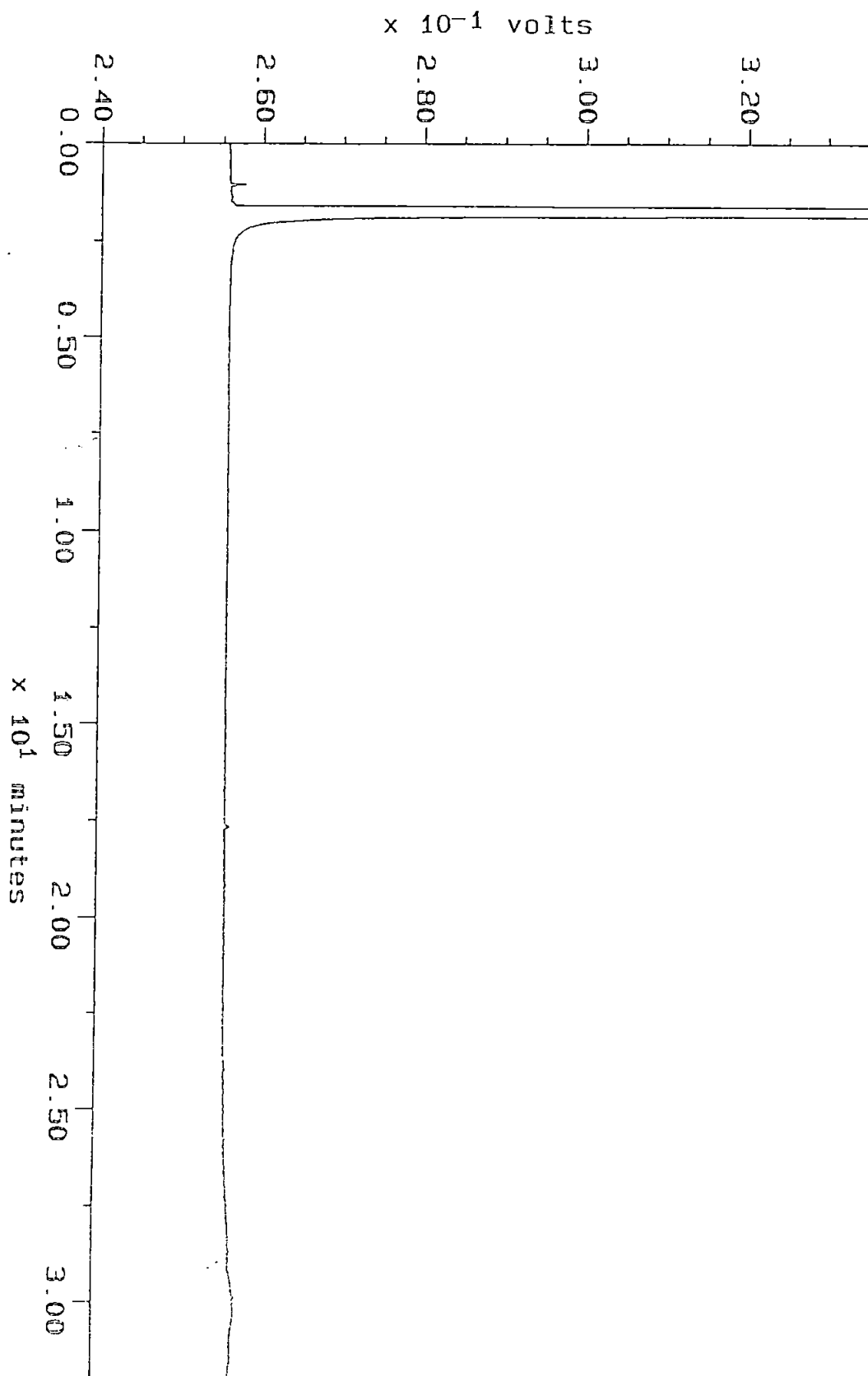




Sample: 13778-1  
Acquired: 09-OCT-90 13:44  
Dilution: 1 : 10.000

Channel: detector 1  
Method: C:\MAX\DATA4\8015  
Amount: 10.150

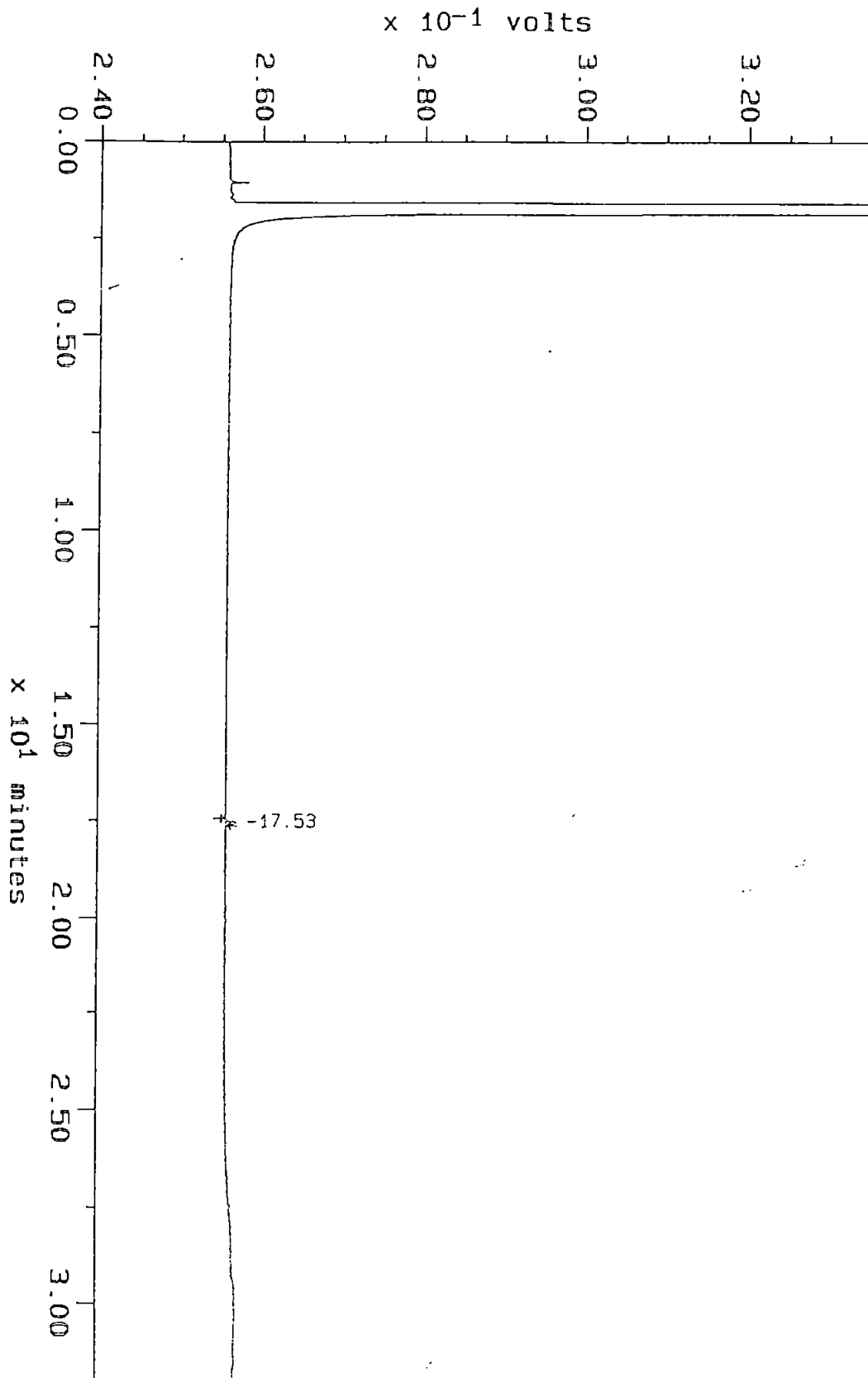
Filename: 13778-1  
Operator:



Sample: 13778-2  
Acquired: 09-OCT-90 14:28  
Dilution: 1 : 10.000

Channel: detector 1  
Method: C:\MAX\DATA4\8015  
Amount: 10.157

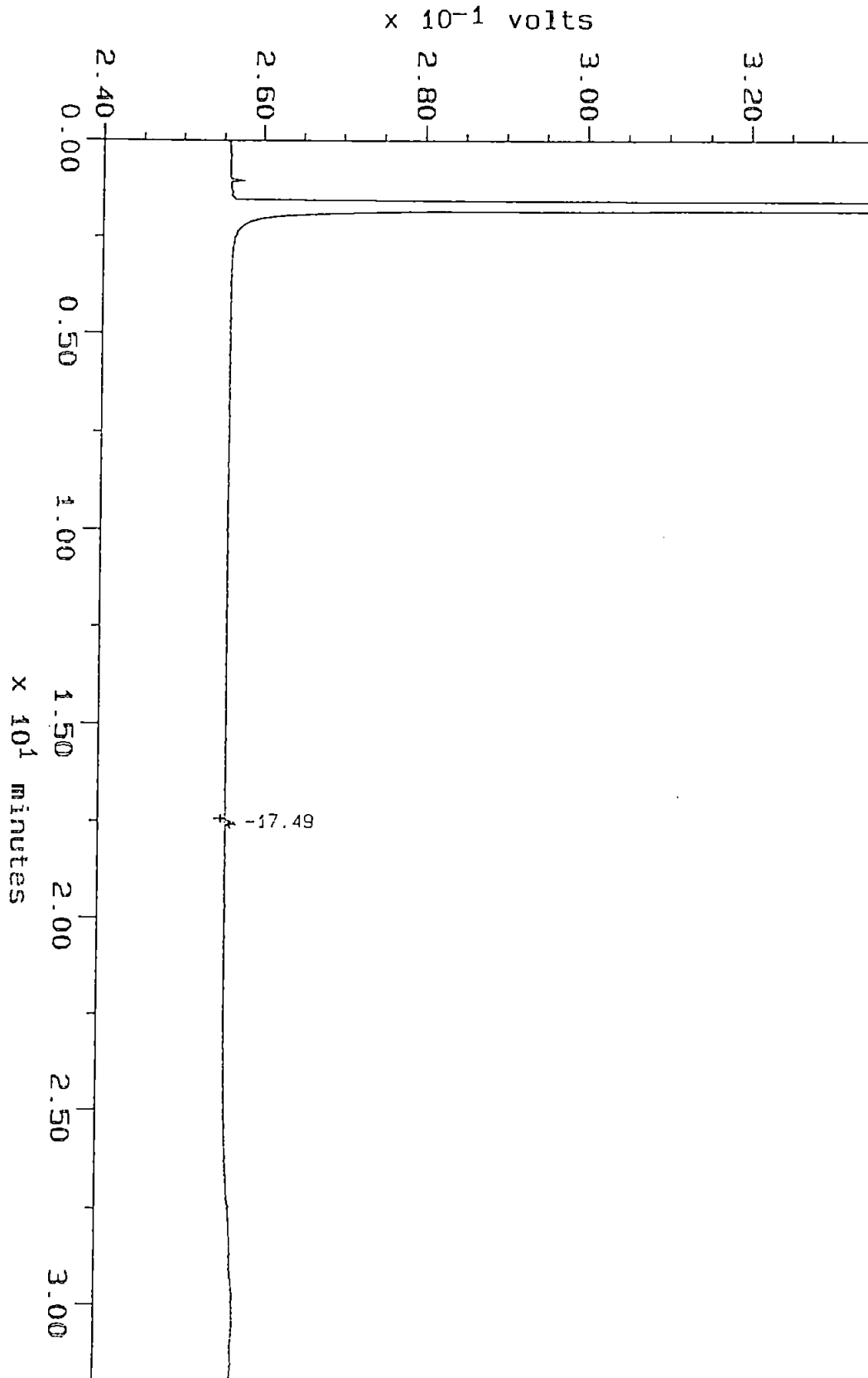
Filename: 13778-2  
Operator:



Sample: 13778-20  
Acquired: 09-OCT-90 15:11  
Dilution: 1 : 10.000

Channel: detector 1  
Method: C:\MAX\DATA4\8015  
Amount: 10.200

Filename: 13778-20  
Operator:





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4630 PACIFIC HIGHWAY EAST, SUITE B-14, TACOMA, WASHINGTON 98424 - TELEPHONE (206)922-2310 - FAX (206)922-5047

Report To: GeoEngineers, Inc.

Date: October 10, 1990

Report On: Analysis of Soil

Lab No.: 13799

IDENTIFICATION:

Samples Received on 10-09-90

Project: 0186-125-B69 Renton PSPL

ANALYSIS:

Lab Sample No.	RUSH 1	RUSH 2
Client Identification	901009-17	901009-18
Matrix/Units	Soil ppm	Soil ppm
Benzene	< 0.05	< 0.05
Toluene	< 0.05	< 0.05
Ethyl Benzene	0.14	< 0.05
Xylenes	0.29	< 0.05
BTEX by EPA SW-846 Method 8020		
Total Petroleum Fuel Hydrocarbons by EPA SW-846 Modified Method 8015	< 10	< 10

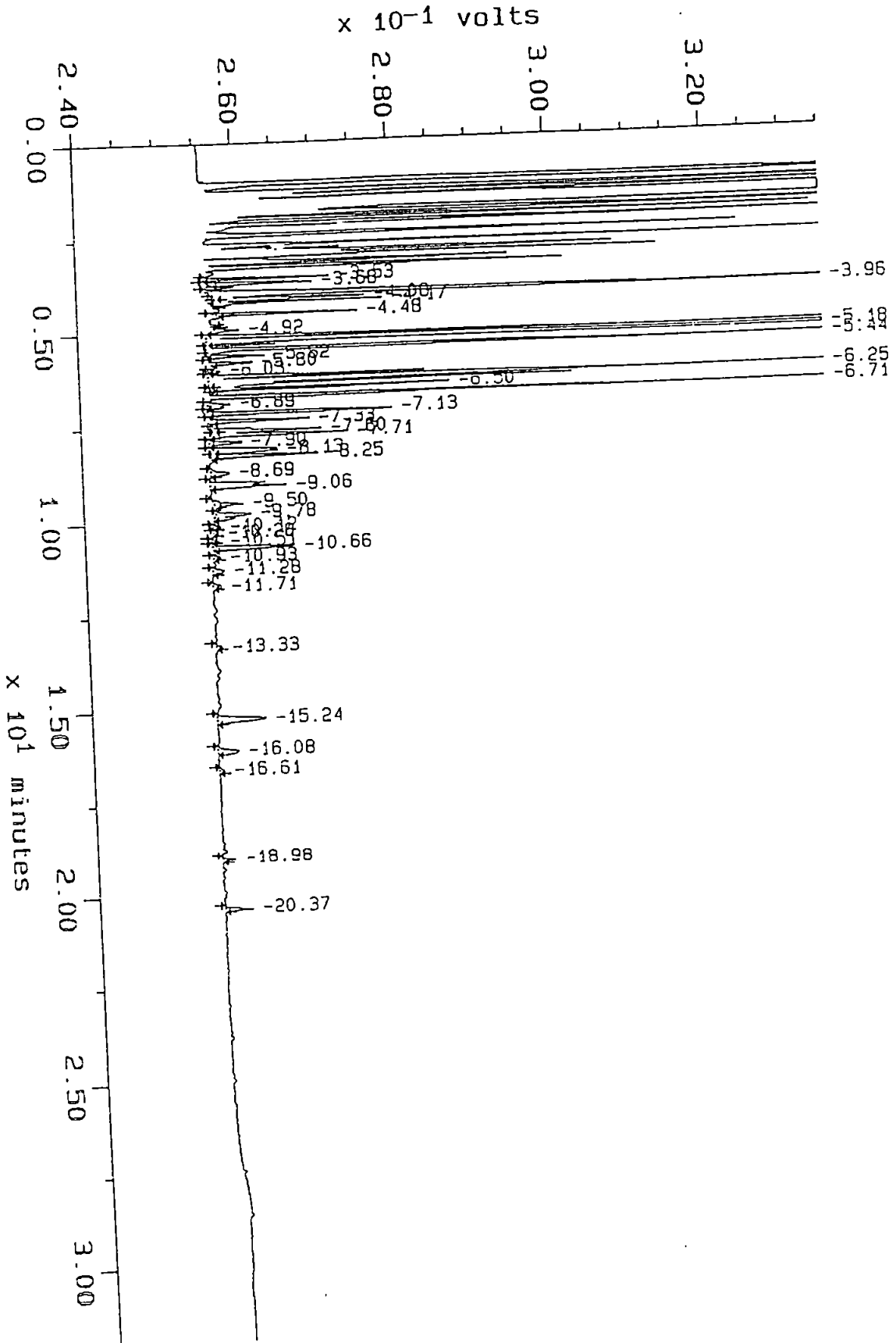
SOUND ANALYTICAL SERVICES

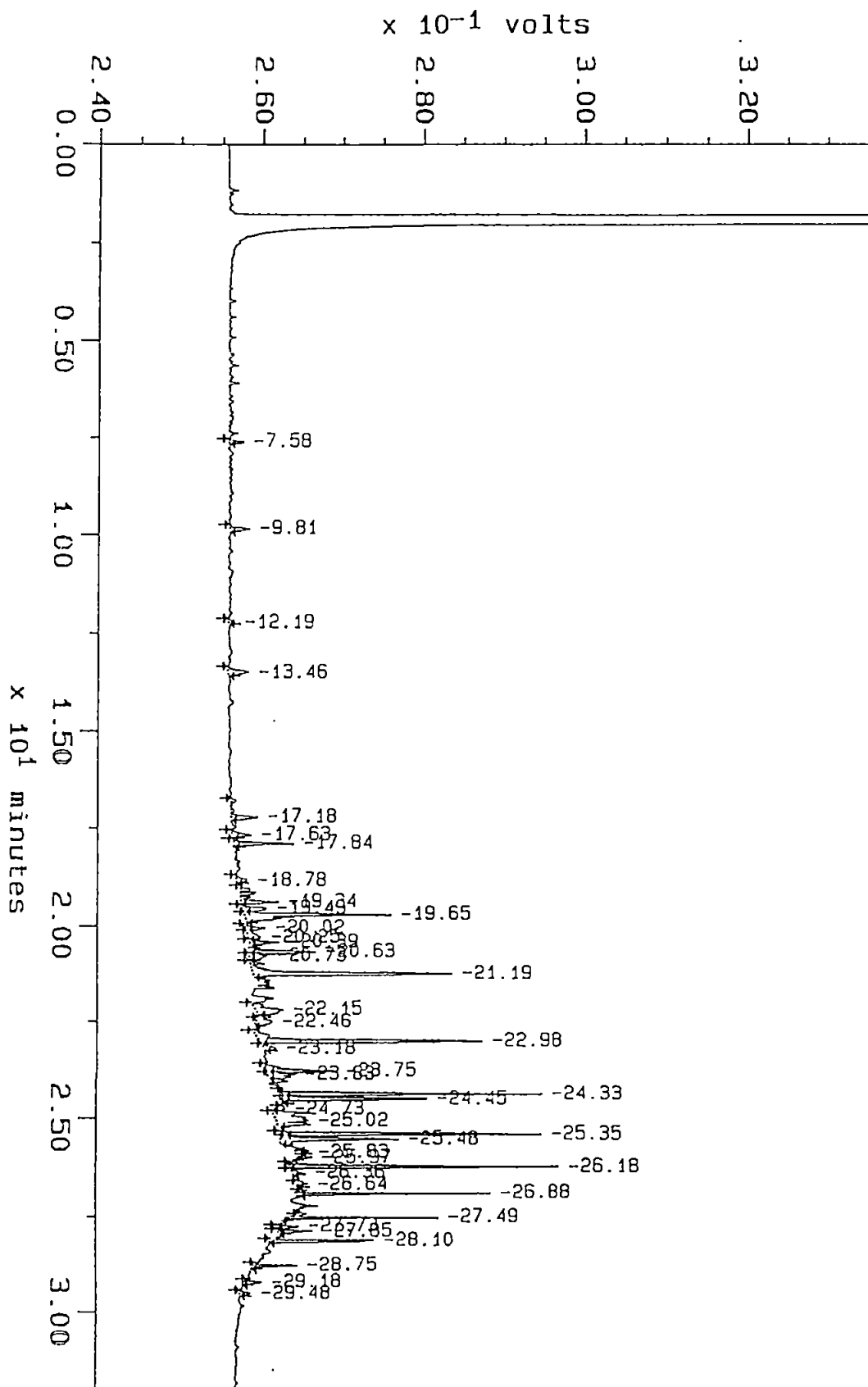
  
C. LARRY ZUBAW

Sample: 1000GAS  
Acquired: 29-SEP-90 4:38

Channel: detector 1  
Method: C:\MAX\DATA4\8015

Filename: 1000G2  
Operator:

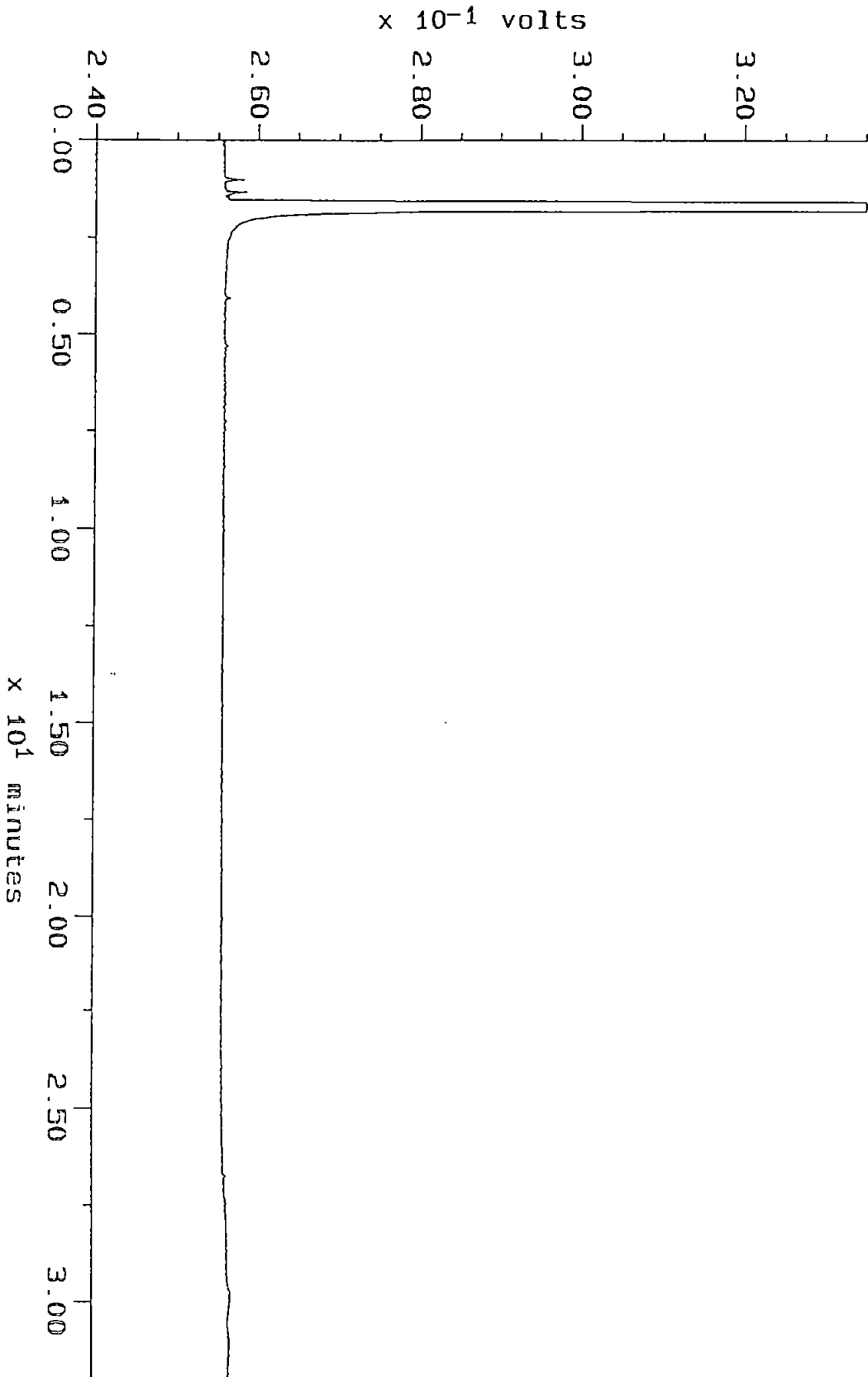




Sample: 13799-1  
Acquired: 09-OCT-90 19:28  
Dilution: 1 : 10.000

Channel: detector 1  
Method: C:\MAX\DATA4\8015  
Amount: 9.663

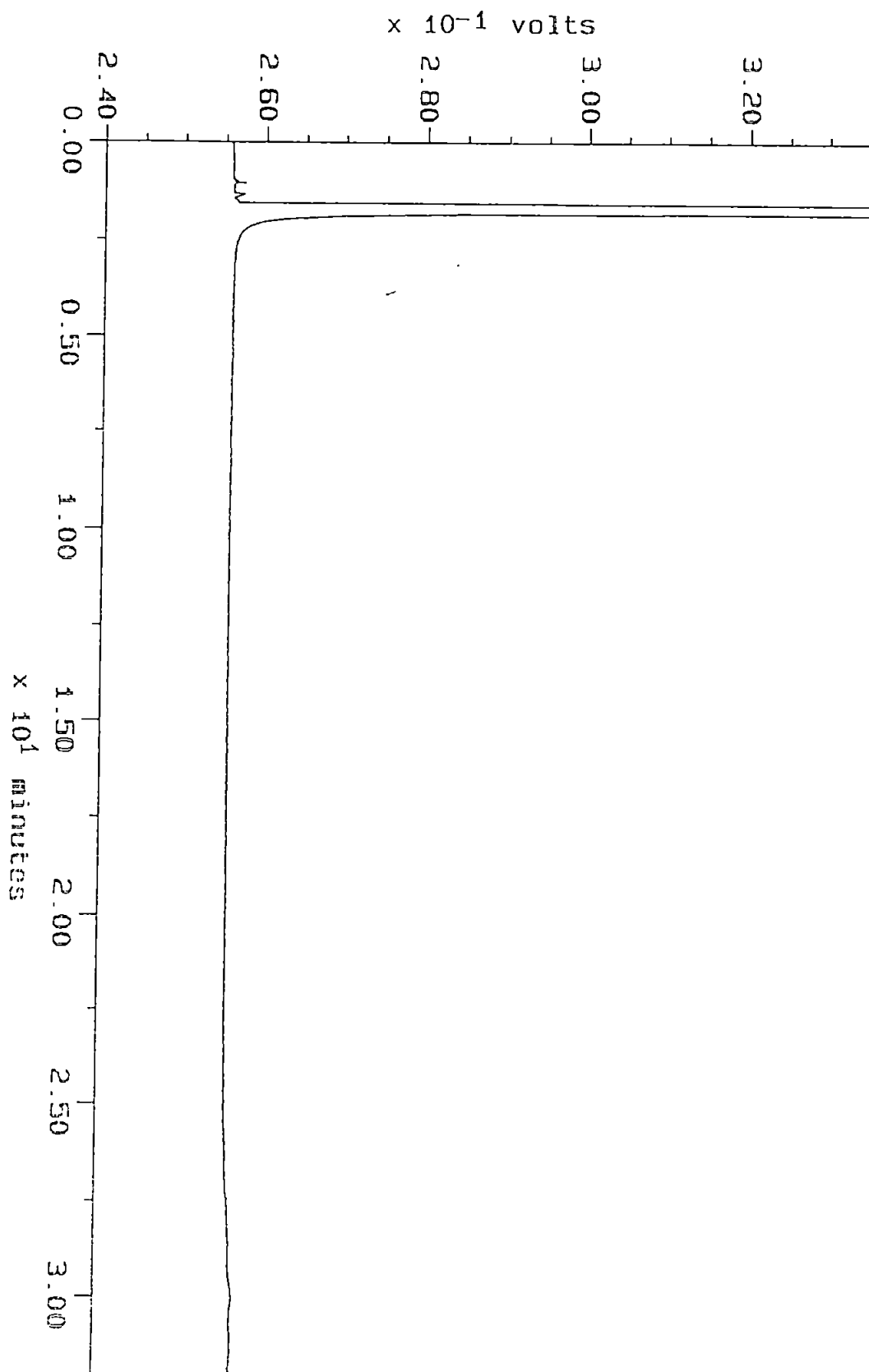
Filename: 13799-1  
Operator:



Sample: 13799-2  
Acquired: 09-OCT-90 20:12  
Dilution: 1 : 10.000

Channel: detector 1  
Method: C:\MAX\DATA4\8015  
Amount: 9.893

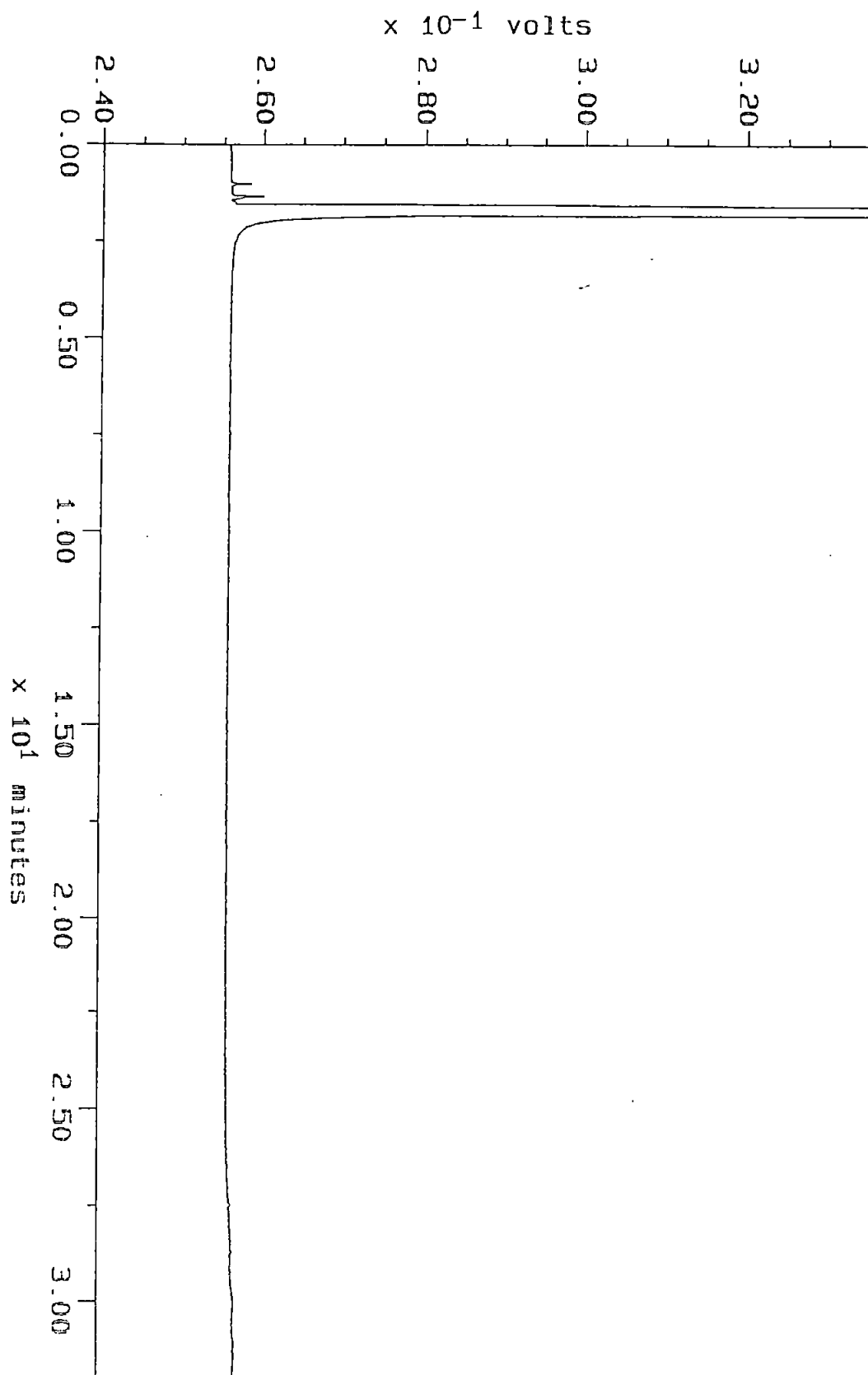
Filename: 13799-2  
Operator:



Sample: 13799-20  
Acquired: 09-OCT-90 20:55  
Dilution: 1 : 10.000

Channel: detector 1  
Method: C:\MAX\DATA4\8015  
Amount: 9.575

Filename: 13799-20  
Operator:





# SOUND ANALYTICAL SERVICES, INC.

SPECIALIZING IN INDUSTRIAL & TOXIC WASTE ANALYSIS

4630 PACIFIC HIGHWAY EAST, SUITE B-14, TACOMA, WASHINGTON 98424 - TELEPHONE (206)922-2310 - FAX (206)922-5047

Report To: GeoEngineers

Date: October 12, 1990

Report On: Analysis of Soil

Lab No.: 13845

IDENTIFICATION:

Samples Received on 10-11-90

Project: 186-125-B69 Renton PSPL

ANALYSIS:

Lab Sample No.	RUSH 1	RUSH 2	RUSH 3
Client Identification	901010- 20	901010- 21	901010- 22
Matrix/Units	Soil ppm	Soil ppm	Soil ppm
Benzene	< 0.05	< 0.05	< 0.05
Toluene	< 0.05	< 0.05	< 0.05
Ethyl Benzene	< 0.05	< 0.05	< 0.05
Xylenes	< 0.05	< 0.05	< 0.05
BTEX by EPA SW-846 Method 8020			
Total Petroleum Fuel Hydrocarbons by EPA SW-846 Modified Method 8015	< 10	< 10	< 10

SOUND ANALYTICAL SERVICES

  
LARRY ZURAW

# SOUND ANALYTICAL SERVICES, INC.

SPECIALIZING IN INDUSTRIAL & TOXIC WASTE ANALYSIS

4630 PACIFIC HIGHWAY EAST, SUITE B-14, TACOMA, WASHINGTON 98424 - TELEPHONE (206)922-2310 - FAX (206)922-5047

## QUALITY CONTROL REPORT

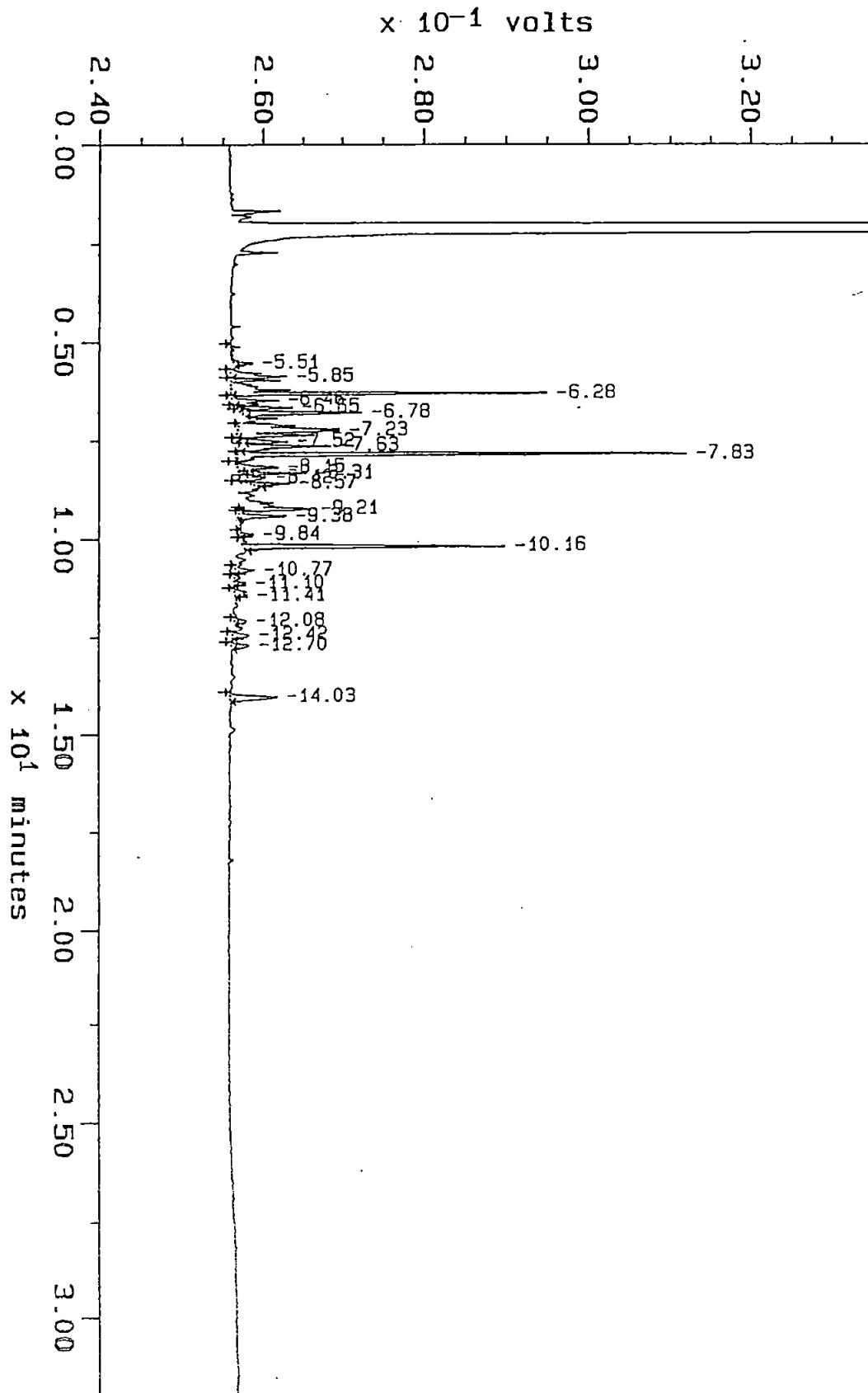
### DUPLICATES

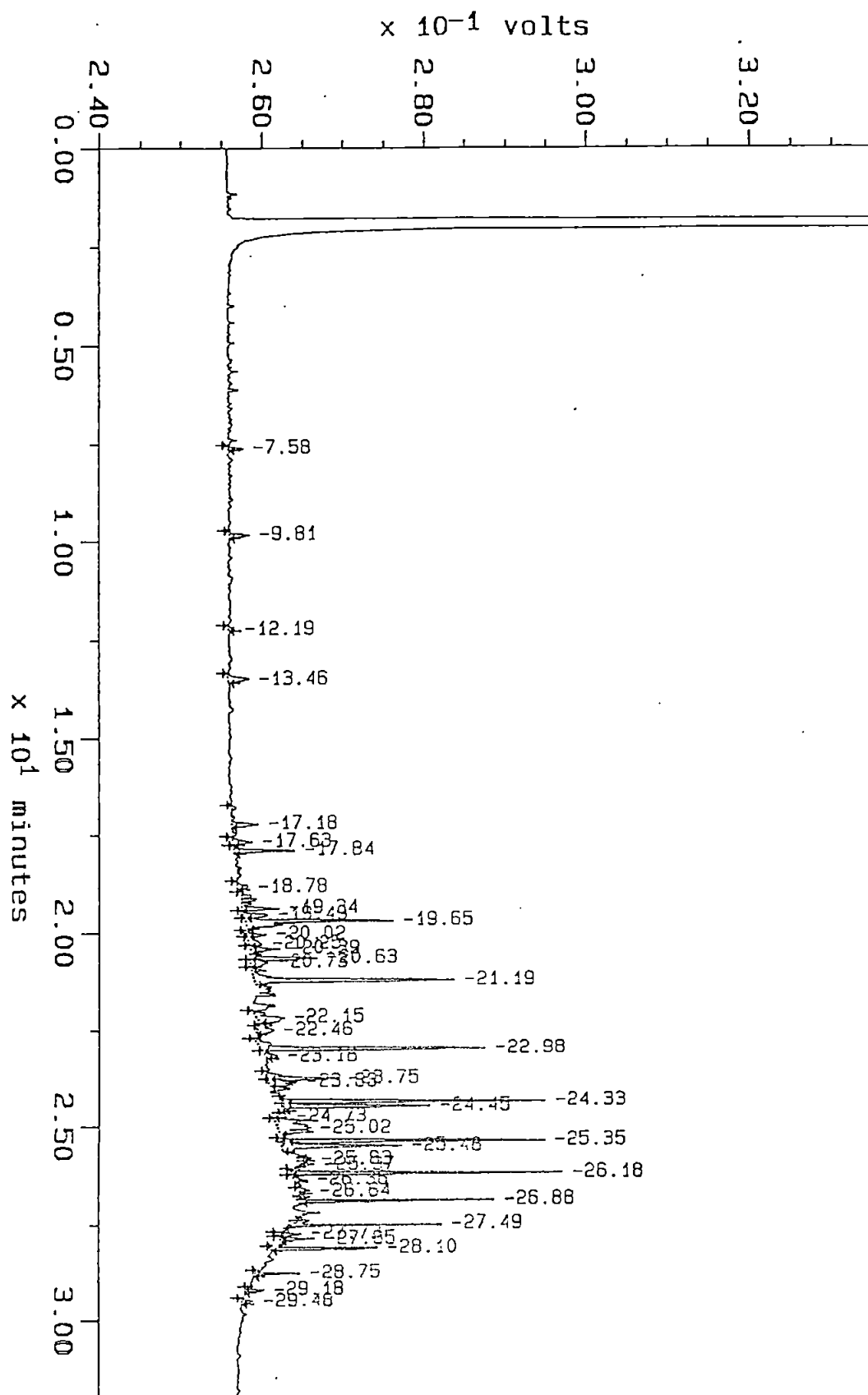
Lab No: 13845  
Date: October 12, 1990  
Client: GeoEngineers, Inc.

Client ID: 901010-20  
Matrix: Soil  
Units: ppm

Compound	Sample(S)	Duplicate(D)	RPD*	
Benzene	< 0.05	< 0.05	---	
Toluene	< 0.05	< 0.05	---	
Ethyl Benzene	< 0.05	< 0.05	---	
Xylenes	< 0.05	< 0.05	---	

\*RPD = relative percent difference  
=  $[(S - D) / ((S + D) / 2)] \times 100$

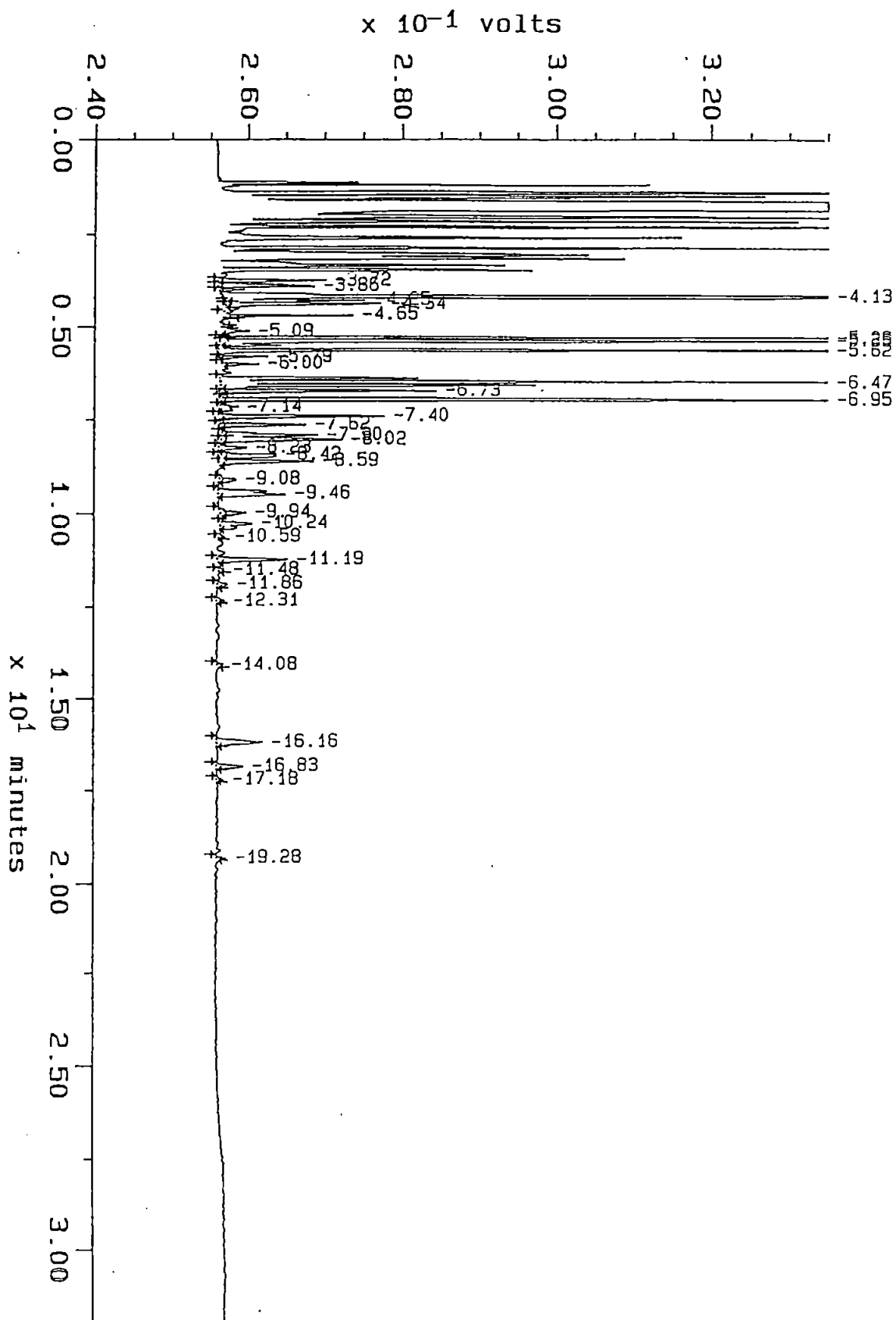




Sample: 1000GAS  
Acquired: 10-OCT-90 18:52  
Dilution: 1 : 10.000

Channel: detector 1  
Method: C:\MAX\DATA4\8015  
Amount: 9.794

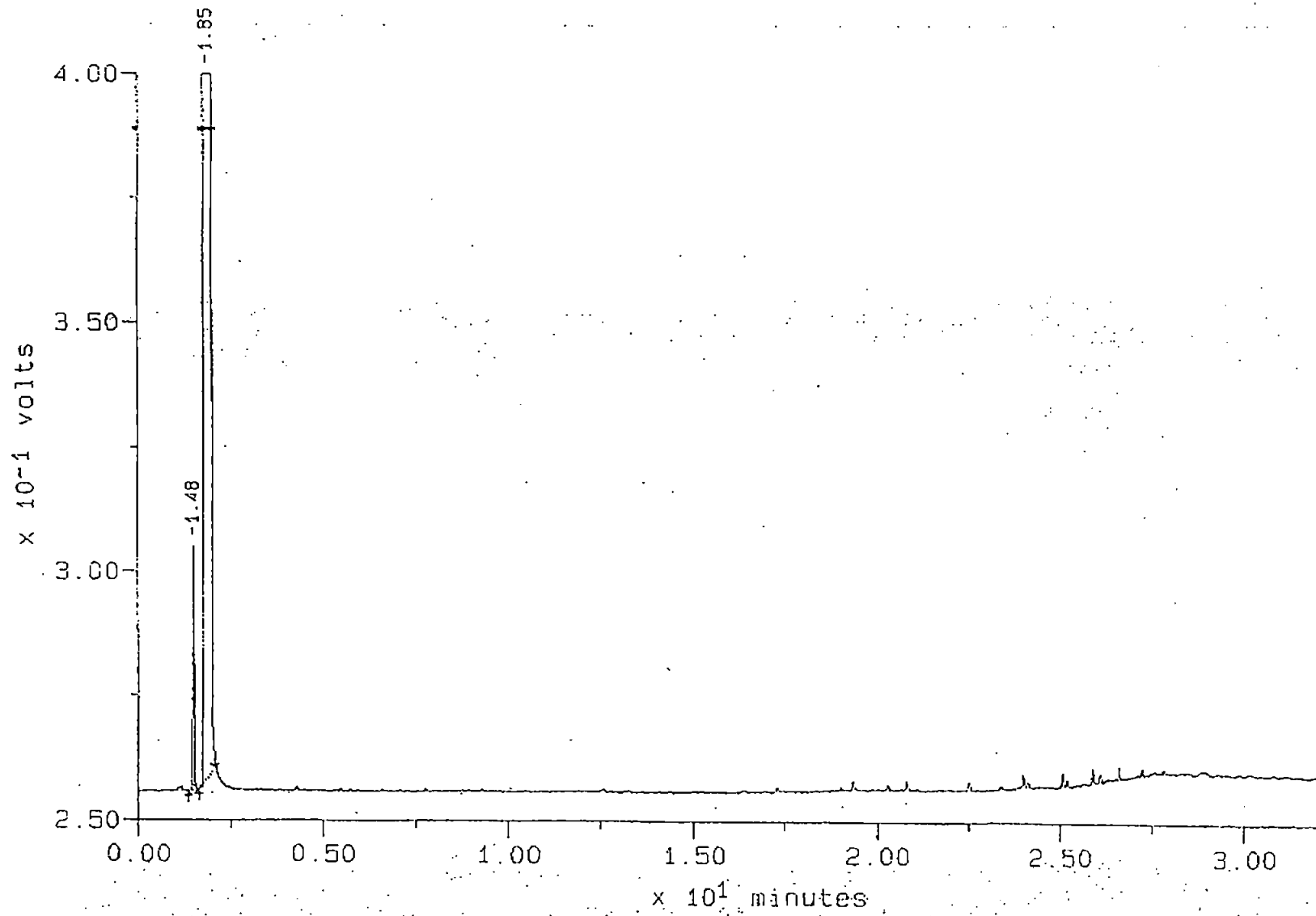
Filename: 1000G1  
Operator:



Sample: 13845-1  
Acquired: 11-OCT-90 18:06

Channel: detector 1  
Method: C:\MAX\DATA\8015

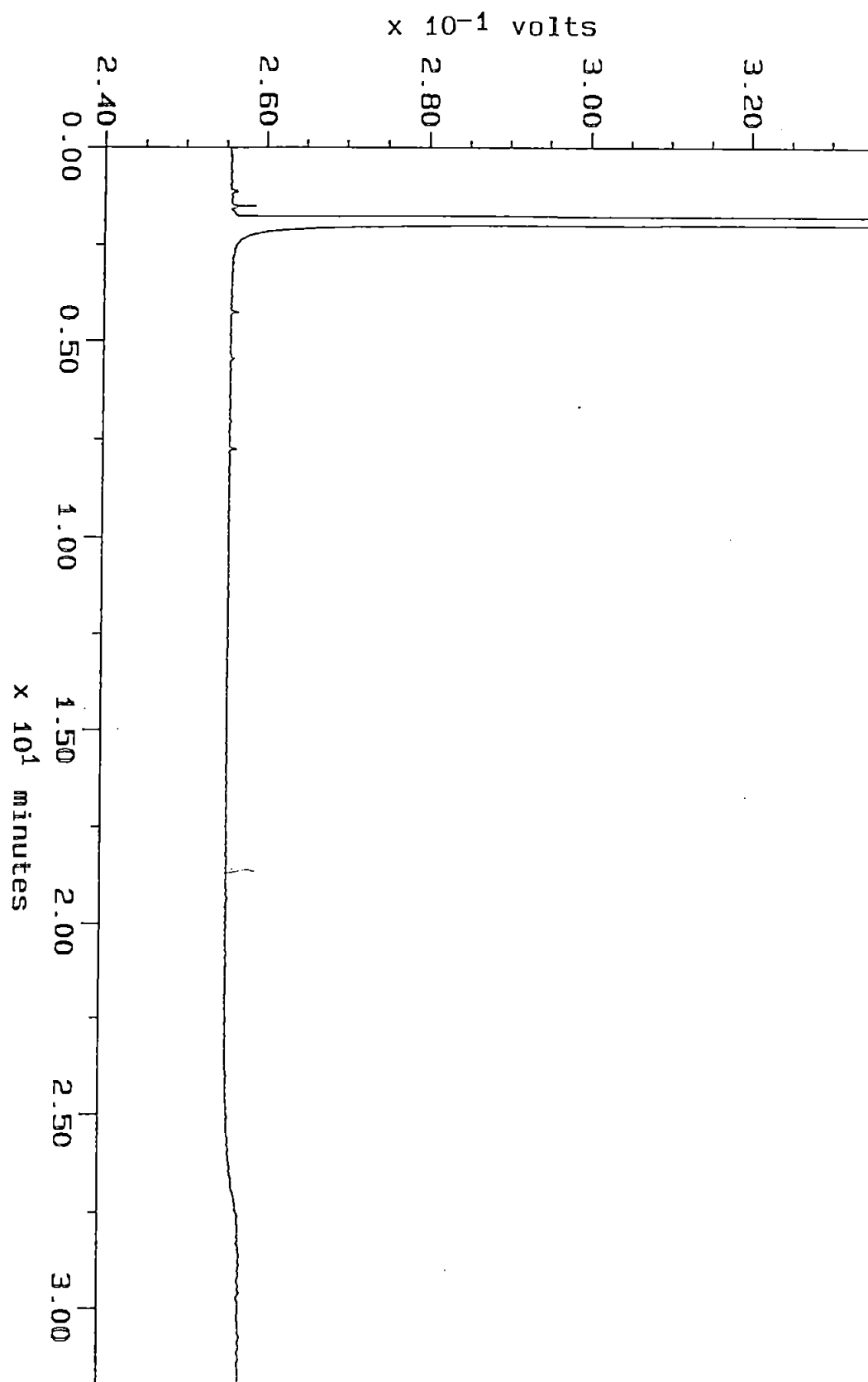
Filename: 13845-1  
Operator:



Sample: 13845-2  
Acquired: 11-OCT-90 19:34  
Dilution: 1 : 10.000

Channel: detector 1  
Method: C:\MAX\DATA4\8015  
Amount: 10.007

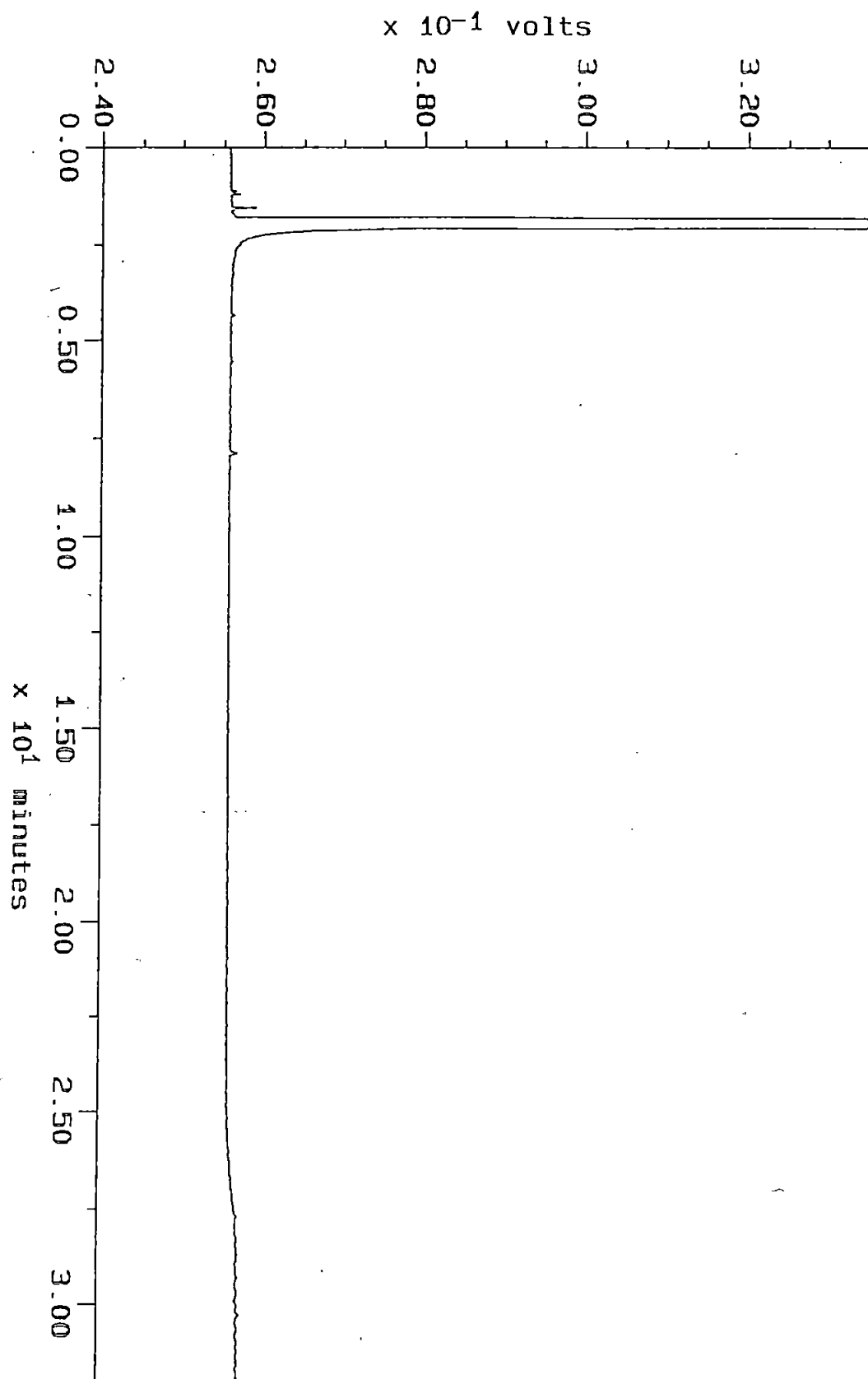
Filename: 13845-2  
Operator:



Sample: 13845-3  
Acquired: 11-OCT-90 20:18  
Dilution: 1 : 10.000

Channel: detector 1  
Method: C:\MAX\DATA4\8015  
Amount: 9.814

Filename: 13845-3  
Operator:





# SOUND ANALYTICAL SERVICES, INC.

SPECIALIZING IN INDUSTRIAL & TOXIC WASTE ANALYSIS

4630 PACIFIC HIGHWAY EAST, SUITE B-14, TACOMA, WASHINGTON 98424 - TELEPHONE (206)922-2310 - FAX (206)922-5047

Report To: GeoEngineers, Inc.

Date: October 12, 1990

Report On: Analysis of Soil

Lab No.: 13849

IDENTIFICATION:

Samples Received on 10-11-90

Project: 0186-125B69 Renton PSPL

ANALYSIS:

Lab Sample No.	RUSH 1	RUSH 2	RUSH 3
Client Identification	901011- 23	901011- 24	901011- 25
Matrix/Units	Soil ppm	Soil ppm	Soil ppm
Benzene	< 0.05	< 0.05	< 0.05
Toluene	< 0.05	< 0.05	< 0.05
Ethyl Benzene	< 0.05	< 0.05	< 0.05
Xylenes	< 0.05	< 0.05	< 0.05
BTEX by EPA SW-846 Method 8020			
Total Petroleum Fuel Hydrocarbons by EPA SW-846 Modified Method 8015	< 10	< 10	< 10

SOUND ANALYTICAL SERVICES

  
C. LARRY ZUBAW

# SOUND ANALYTICAL SERVICES, INC.

SPECIALIZING IN INDUSTRIAL & TOXIC WASTE ANALYSIS

4630 PACIFIC HIGHWAY EAST, SUITE B-14, TACOMA, WASHINGTON 98424 - TELEPHONE (206)922-2310 - FAX (206)922-5047

## QUALITY CONTROL REPORT

### DUPLICATES

Lab No: 13849  
Date: October 12, 1990  
Client: GeoEngineers, Inc.

Client ID: 901011-23  
Matrix: Soil  
Units: ppm

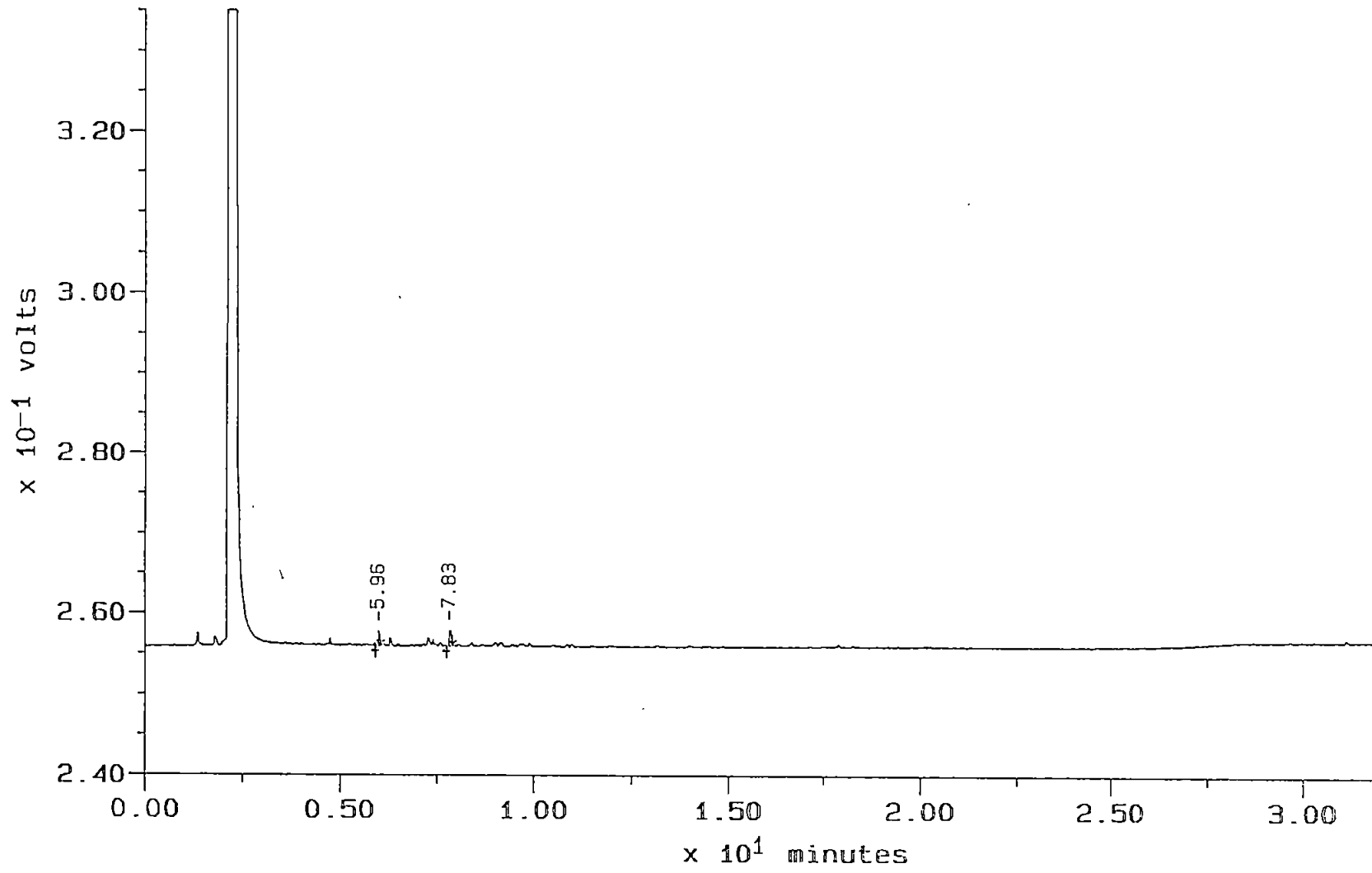
Compound	Sample(S)	Duplicate(D)	RPD*	
Benzene	< 0.05	< 0.05	---	
Toluene	< 0.05	< 0.05	---	
Ethyl Benzene	< 0.05	< 0.05	---	
Xylenes	< 0.05	< 0.05	---	
Total Petroleum Fuel Hydrocarbons	< 10	< 10	---	

\*RPD = relative percent difference  
=  $[(S - D) / ((S + D) / 2)] \times 100$

Sample: 13849-1  
Acquired: 12-OCT-90 7:57  
Dilution: 1 : 10.000

Channel: detector 1  
Method: C:\MAX\DATA4\8015  
Amount: 9.485

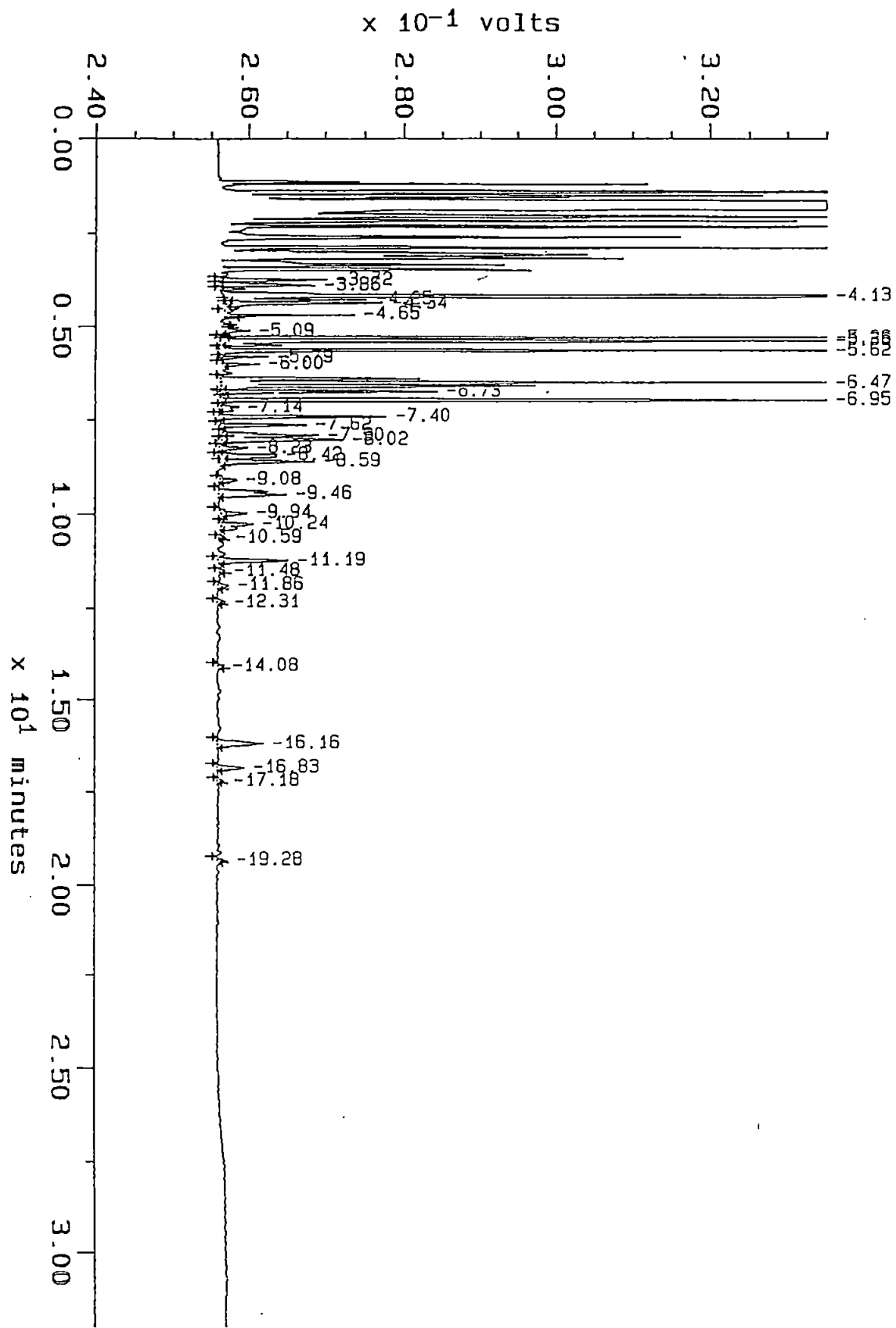
File name: 13849-1  
Operator:

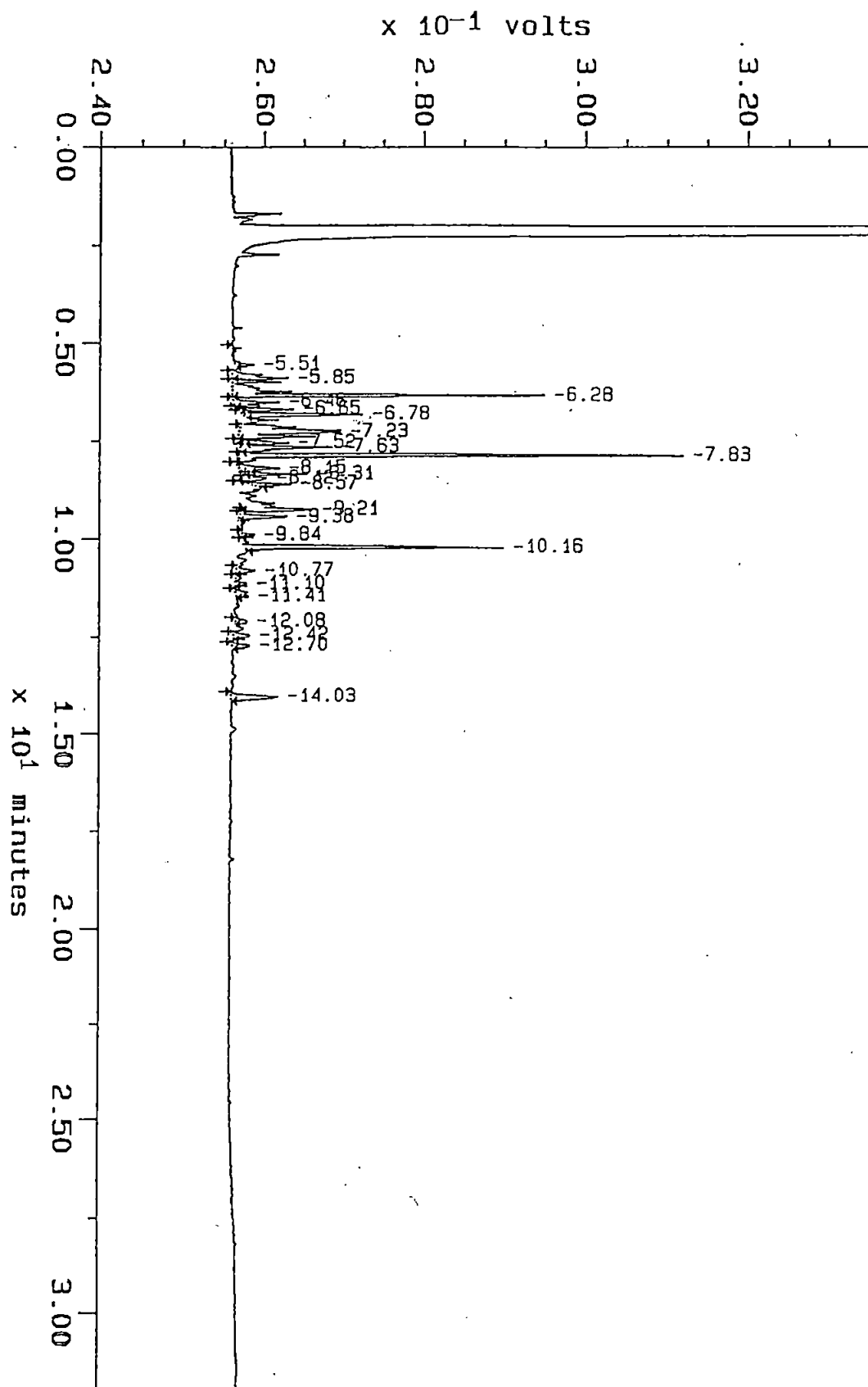


Sample: 1000GAS  
Acquired: 10-OCT-90 18:52  
Dilution: 1 : 10.000

Channel: detector 1  
Method: C:\MAX\DATA4\8015  
Amount: 9.794

Filename: 1000G1  
Operator:

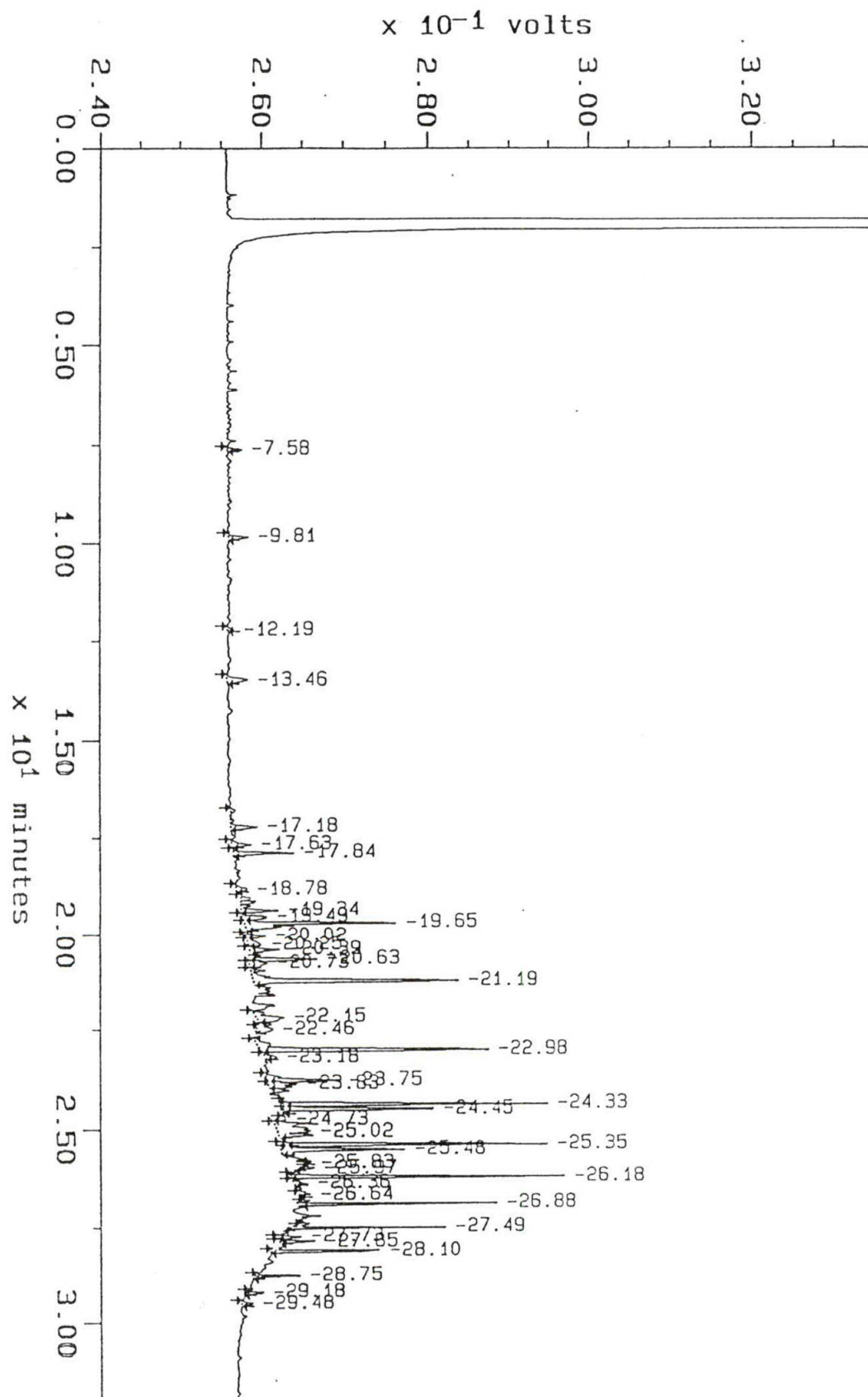




Sample: 1000DIESEL  
Acquired: 09-OCT-90 9:23

Channel: detector 1  
Method: C:\MAX\DATA4\8015

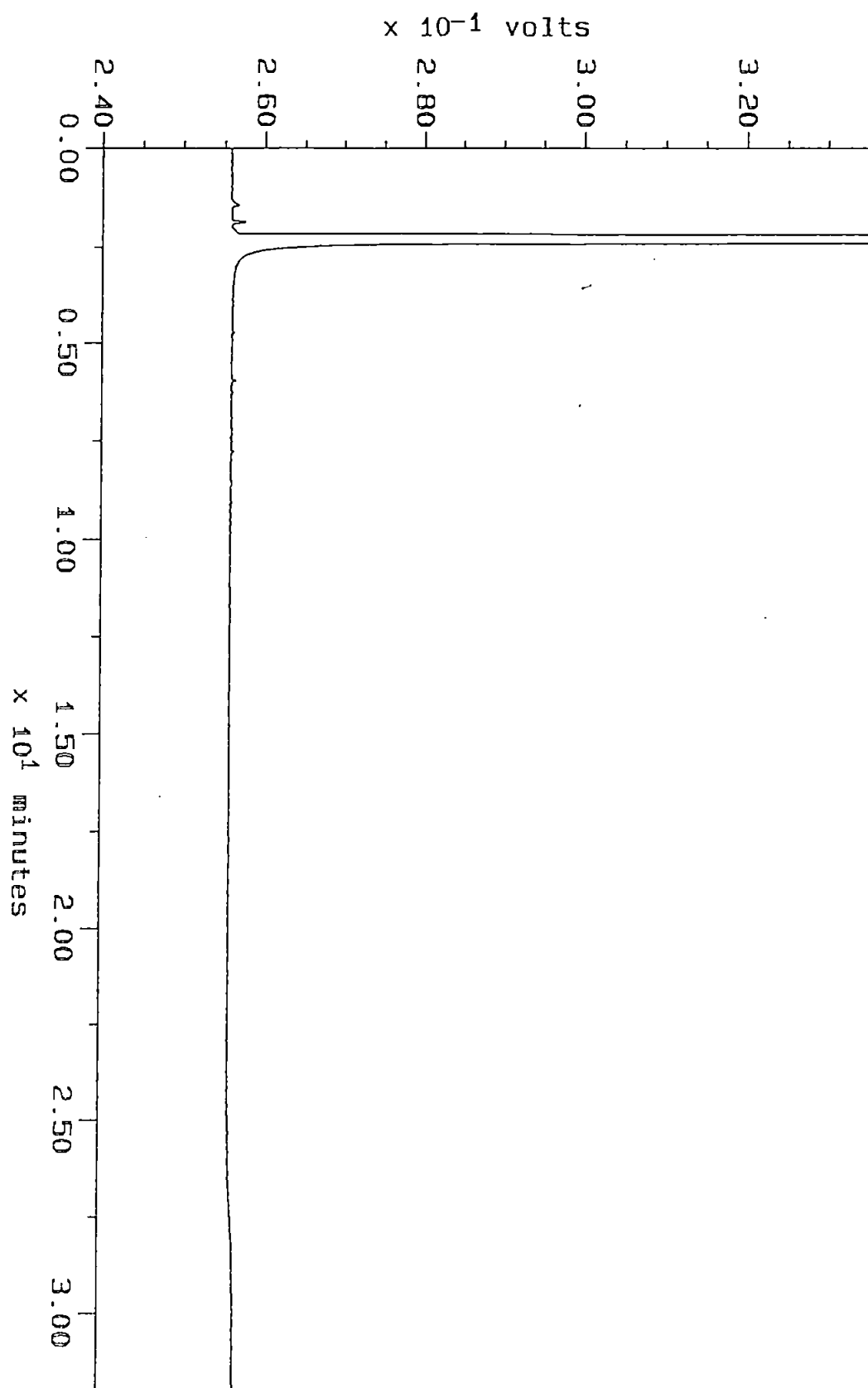
Filename: 1000D3  
Operator:



Sample: 13849-1D  
Acquired: 12-OCT-90 8:40  
Dilution: 1 : 10.000

Channel: detector 1  
Method: C:\MAX\DATA4\8015  
Amount: 9.819

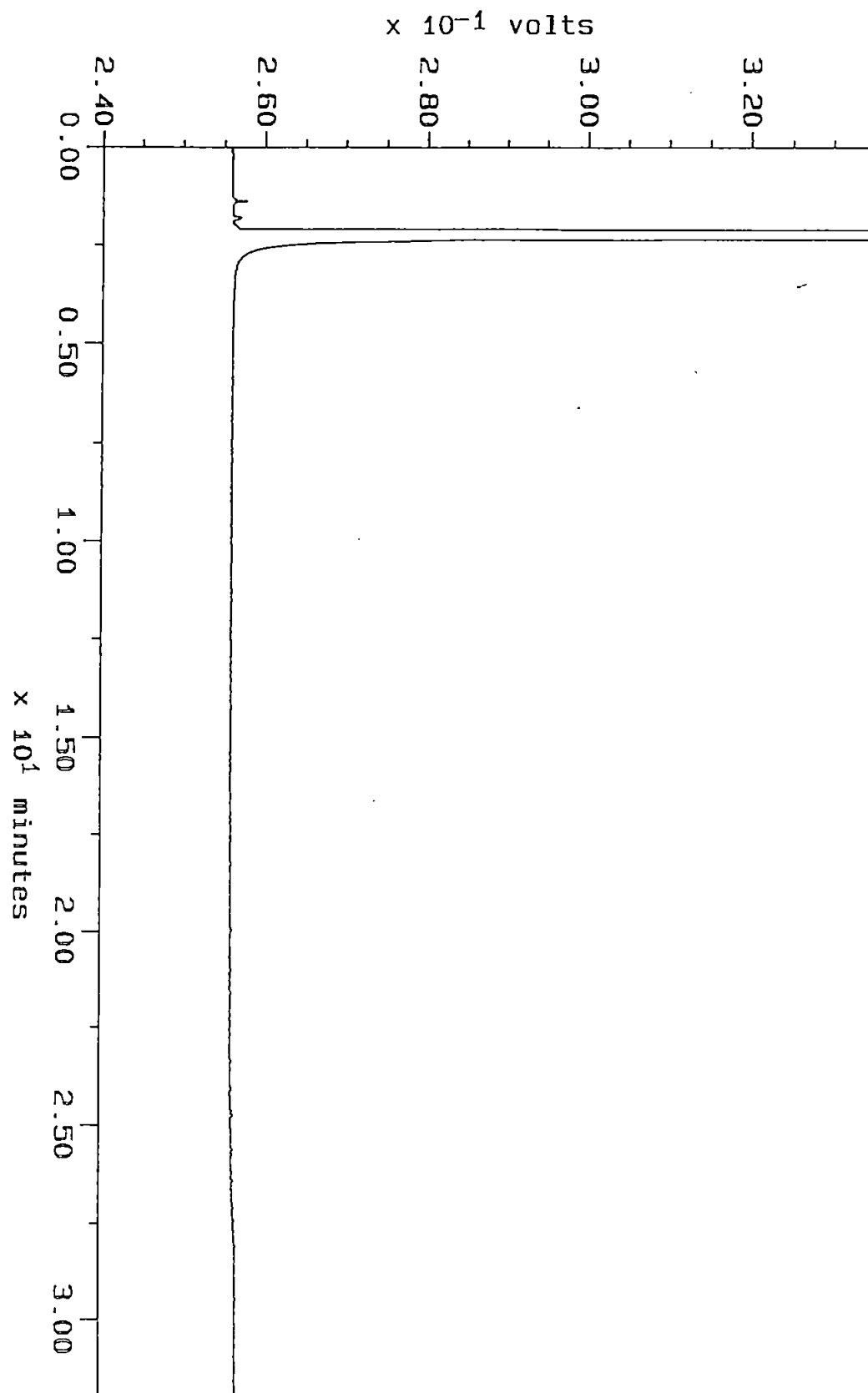
Filename: 13849-1D  
Operator:



Sample: 13849-2  
Acquired: 12-OCT-90 9:24  
Dilution: 1 : 10.000

Channel: detector 1  
Method: C:\MAX\DATA4\8015  
Amount: 9.785

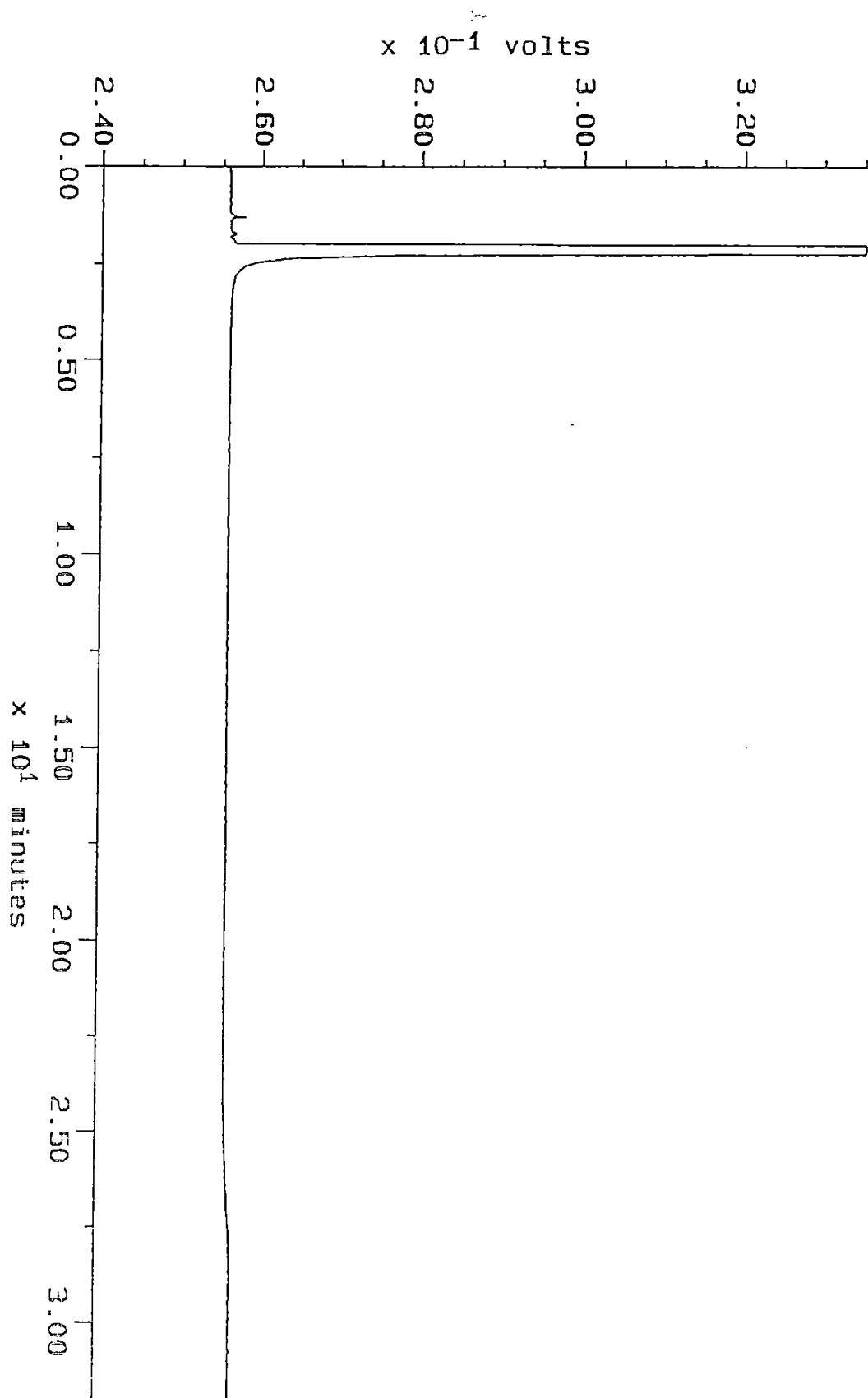
Filename: 13849-2  
Operator:



Sample: 13849-3  
Acquired: 12-OCT-90 10:08  
Dilution: 1 : 10.000

Channel: detector 1  
Method: C:\MAX\DATA4\8015  
Amount: 10.005

Filename: 13849-3  
Operator:



★ PLEASE RUSH ★

CHAIN OF CUSTODY RECORD

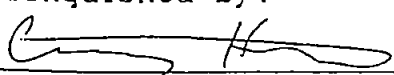
Page 1 of 1

CUSTOMER: GEI

PROJECT: RENTON PSDL P.O./JOB NO.: 0186-125-869

SAMPLER: CAH

Lab No.	Sample No.	Date	Time	Cont.	Analysis Required
	901011 - 23	10/11/90	1200	Soil	8015, BETX
	- 24	"	"	"	" , "
	- 25	"	"	"	" , "
					Please Rush
					24 HRS OR
					BETTER PLEASE
					FAX RESULTS TO
					KATHY KILLMAN @
					GEOENGINEERS
					THANK YOU!
					CRAIG HART

Relinquished by:	Date	Time	Received by:	Date	Time
	10/11/90	1230			

Relinquished by:	Date	Time	Received by:	Date	Time
<u>R. Rene/SAS</u>	10-11	1:50			

Dispatched by:	Date	Time	Received at lab by:	Date	Time

SOUND ANALYTICAL SERVICES, INC.  
 4630 Pacific Hwy East Suite B-14  
 Tacoma, WA 98424 (206) 922-2310  
 FAX (206) 922-5047



ATI I.D. # 9010-053

October 16, 1990

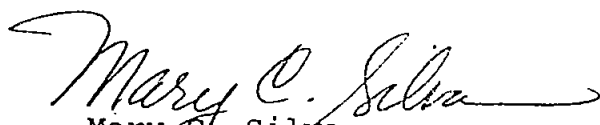
GeoEngineers, Inc.  
2405 140th Avenue N.E.  
Suite 105  
Bellevue, WA 98005

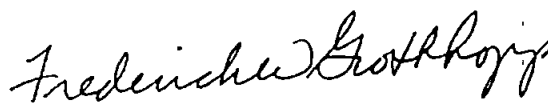
Attention : Kathy Killman

Project Number : 186-125-B69

Project Name : Renton PSPL

On October 4, 1990, Analytical Technologies, Inc. received one water sample for analysis. The sample was analyzed with EPA methodology or equivalent methods as specified in the attached analytical schedule. The results, sample cross reference, and the quality control data are enclosed.

  
Mary C. Silva  
Senior Project Manager  
FWG/tc

  
Frederick W. Grothkopp  
Technical Manager



## SAMPLE CROSS REFERENCE SHEET

CLIENT : GEOENGINEERS, INC.  
PROJECT # : 186-125-B69  
PROJECT NAME : RENTON PSPL

ATI #	CLIENT DESCRIPTION	DATE SAMPLED	MATRIX
9010-053-1	901001-13	10/04/90	WATER

## ----- TOTALS -----

MATRIX	# SAMPLES
WATER	1

## ATI STANDARD DISPOSAL PRACTICE

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



ANALYTICAL SCHEDULE

CLIENT : GEOENGINEERS, INC.  
PROJECT # : 186-125-B69  
PROJECT NAME : RENTON PSPL

ANALYSIS	TECHNIQUE	REFERENCE	LAB
PETROLEUM HYDROCARBONS	IR	EPA 418.1	R

R = ATI - Renton  
SD = ATI - San Diego  
T = ATI - Tempe  
PNR = ATI - Pensacola  
FC = ATI - Fort Collins  
SUB = Subcontract



GENERAL CHEMISTRY RESULTS

CLIENT	: GEOENGINEERS, INC.	SAMPLE MATRIX	: WATER
PROJECT #	: 186-125-B69		
PROJECT NAME	: RENTON PSPL	UNITS	: mg/L

ATI I.D. #	CLIENT I.D.	PETROLEUM HYDROCARBONS
9010-053-1	901001-13	<1

## GENERAL CHEMISTRY QUALITY CONTROL

CLIENT : GEOENGINEERS, INC.  
 PROJECT # : 186-125-B69  
 PROJECT NAME : RENTON PSPL

SAMPLE MATRIX : WATER

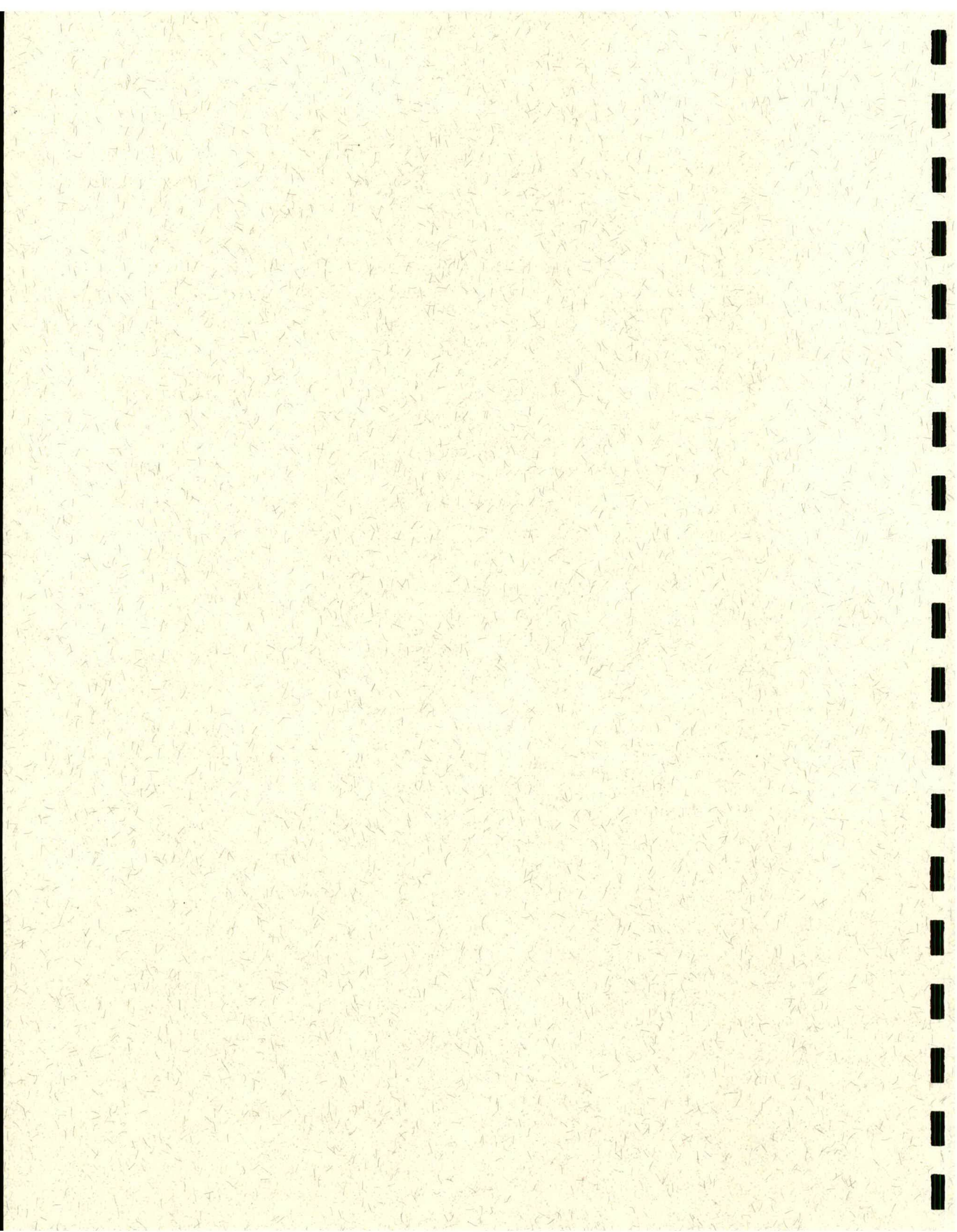
PARAMETER	UNITS	ATI I.D.	SAMPLE RESULT	DUP RESULT	RPD	SPIKED RESULT	SPIKE ADDED	% REC
PETROLEUM HYDROCARBONS	mg/L	9010-053-1	<1	<1	0	7.0	10	70

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

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



APPENDIX C



METRO DISCHARGE AUTHORIZATION  
FOR  
SPECIAL/MINOR DISCHARGER  
NUMBER 253

FOR

Puget Power c/o Chemical Processors, Inc.  
3400 E. Marginal Way South  
620 S. Grady Wy., Renton  
Seattle, WA 98134

CONTACT: Peter Vandervelde

PHONE: 682-4898

TYPE: General Maintenance & Repair Facility

SIC: 4911

EPA I.D.:

DISCHARGE TO: METRO SEWER

\*NOTE: This authorization is valid only for the  
specific process and dates shown below:

DISCHARGE PROCESS: Groundwater Remediation

MAXIMUM VOLUME: 9000 GPD ✓

DOCUMENT EFFECTIVE DATE: 10/25/90  
EXPIRATION DATE: 10/25/91

For information concerning this Metro Discharge Authorization  
please contact Jim Sifford, Industrial Waste Investigator at  
684-2335.

24-HOUR  
EMERGENCY NOTIFICATION

RENTON TREATMENT PLANT: 684-2400

DEPARTMENT OF ECOLOGY: 867-7000

-----  
(For Your Use)

LOCAL FIRE DEPARTMENT: \_\_\_\_\_

24-HR. CORPORATE CONTACTS: \_\_\_\_\_

METRO DISCHARGE AUTHORIZATION  
 NUMBER 253  
 PAGE 2

GENERAL DISCHARGE LIMITATIONS

Corrosive Substances

The lower pH limit is 5.5; the discharge of any substance which can cause corrosive damage to the metro sewerage system either by itself or through interaction with other substances, is not allowed. *pH meter (GEI)*

High Temperature

The industrial user shall not discharge material with a temperature in excess of 65 C (150 F).

Fats, Oils and Greases

The industrial user shall not discharge wastes that contain in excess of 100 milligrams per liter (mg/l) of polar fats, oils and greases (FOG) or 100 mg/l of non-polar FOG. *Replace with 4181*

Flammable or Explosive Materials

Materials which can cause two successive readings on an explosion hazard meter, at the point of discharge into the system (or at any point in the system), be more than five percent (5%) nor any single reading over ten percent (10%) of the Lower Explosive Limit (LEL) on the meter are not allowed. Prohibited materials include, but are not limited to, gasoline, kerosene, naphtha, benzene, toluene, xylene, ethers, alcohols, ketones, aldehydes, peroxides, chlorates, perchlorates, bromates, carbides, hydrides and sulfides and any other substances which the City and the State or EPA have notified the user are a fire hazard or a hazard to the system.

Restricted Substances

*TLV ?*

The industrial user shall not discharge wastes which exceed the following limitations:\*

Arsenic	1.0	Mercury	0.1
Cadmium	1.2	Nickel	6.0
Chromium	6.0	Silver	1.0
Copper	3.0	Zinc	5.0
Lead	3.0	Cyanide	2.0

*ONLY*

\* Expressed as milligrams per liter

GENERAL CONDITIONS

1. All requirements and ordinances of Metro Resolution No. 3374 pertaining to the discharge of wastes into the municipal sewer system are hereby made a condition of this Discharge Authorization.
2. Any facility changes which will result in a change in the character or volume of the pollutants discharged to the municipal sewer system must be reported to your Metro representative. Any facility changes that will cause the violation of the effluent limitations specified herein will not be allowed.
3. In the event the industrial user is unable to comply with any of the conditions of this Discharge Authorization because of a breakdown of equipment or facilities, an accident caused by human error, negligence, or any other cause, such as an act of nature, the company shall:
  - (a) take immediate action to stop, contain and clean up the unauthorized discharges and correct the problem.
  - (b) immediately notify the Municipality of Metropolitan Seattle so steps can be taken to prevent damage to the sewerage system.
  - (c) submit a written report describing the breakdown, the actual quantity and quality of resulting waste discharged, corrective action taken, and the steps taken to prevent a recurrence.

Compliance with these requirements does not relieve the industrial user from responsibility to maintain continuous compliance with the conditions of the Discharge Authorization or the resulting liability for failure to comply.

4. The industrial user shall, at all reasonable times, allow authorized representatives of the Municipality of Metropolitan Seattle to enter that portion of the premises where an effluent source or disposal system is located or in which any records are required to be kept under the terms and conditions of this Discharge Authorization.

METRO DISCHARGE AUTHORIZATION  
NUMBER 253  
PAGE 4

5. Nothing in the Discharge Authorization shall be construed as excusing the industrial user from compliance with any applicable federal, state, or local statutes, ordinances, or regulations.
6. This Discharge Authorization does not constitute authority for discharge into waters of the state. Any such discharge is subject to regulation and enforcement action by the Department of Ecology.
7. All requirements and ordinances of the Environmental Protection Agency and Department of Ecology pertaining to hazardous and toxic wastes, disposal facilities, and discharge of wastes into the municipal sewer system, are hereby made a condition of this Discharge Authorization.

THE SPECIAL CONDITIONS FOR THIS DISCHARGE AUTHORIZATION ARE ON THE FOLLOWING PAGE. FOR THIS DISCHARGE AUTHORIZATION TO BE VALID, THESE SPECIAL CONDITIONS MUST BE MET.

Investigator:

Date:

*Jim Jefford*  
10-25-1990

METRO DISCHARGE AUTHORIZATION  
NUMBER 253  
PAGE 5

SPECIAL CONDITIONS

Discharge Limitations

<u>Constituent</u>	<u>Maximum Concentration, ppm</u>
Benzene	0.13
Toluene	1.5
Ethylbenzene	1.4
Non-polar Fats, Oil & Grease (non-polar FOG) - T.P.M.	100

The concentrations for benzene, toluene and ethylbenzene are the proposed Metro local limits for these parameters (limits are subject to public review and comment and SEPA review, with a tentative adoption date of August 6, 1990). For the purposes of this discharge authorization, the proposed limits are your discharge limits.

Operating Procedures

Common Sense Criteria

- a) There shall be no pronounced odor of solvent or gasoline.
- b) There shall be no pronounced oil sheen or unusual color.
- c) There shall be no pronounced hydrogen sulfide (rotten egg) odor.
- d) There shall be no visibly pronounced turbidity, the discharge must remain translucent.

Metro will expect operators on site to pay close attention to these common sense criteria whenever discharge to the sanitary sewer is occurring. If any of the discharge limits or common sense criteria are exceeded, you must stop discharging and notify the Metro Industrial Waste Section at 684-2325.

METRO DISCHARGE AUTHORIZATION  
NUMBER 253  
PAGE 6

Monitoring Requirements

The following monitoring requirements shall be met for this discharge authorization:

<u>Parameter</u>	<u>Frequency</u>	<u>Sample Type/Method</u>
Flow	Monthly Average (expressed as gallons/day)	Meter or pump rate (gallons/day)
Explosivity	Weekly for first month; monthly thereafter	Meter
Common Sense Criteria	Continuous	Observation
Hydrogen Sulfide	Only if common sense criteria are exceeded	Meter
Settleable Solids	Only if common sense criteria are exceeded	Grab/Imhoff Cone or Turbidity Meter
Metals (lead)	Weekly for first month of discharge; monthly thereafter	Grab
Benzene, toluene, ethylbenzene	Weekly for first month; monthly / thereafter	Grab/EPA Method 602
Non-polar FOG T.P.H.	Weekly for first month; monthly thereafter	Grab/Standard Method 5520F

A monthly self monitoring report shall be filed with Metro by the 15th day of the month following sample collection. This report must include the total monthly volume of water discharged to the sewer as well as the analytical results.

The suggested analytical method for the contaminant indicators benzene, ethylbenzene and toluene is EPA Method 602 in Methods for Organic Chemical Analysis of Municipal and Industrial Wastewater (EPA-600/4-82-057, July 1982). The required analytical method for the contaminant indicator of non-polar FOG is Method 5520F (with a partition-gravimetric extraction procedure) in the 1989 Standard Methods for the Examination of Water and Wastes (17th edition).

City of Renton Requirements

The following conditions are a requirement of City of Renton Public Works Department and are hereby incorporated as special conditions to this authorization.

1. Upon receipt of the Discharge Authorization, the applicant shall make application for a side sewer permit to insure proper connection to the City system.
2. A meter shall be installed on the discharge connection for the purpose of determining City of Renton sewer billing charges.
3. Applicant shall sign an "Authorization for Special Billing" form for billing purposes.
4. All analytical test reports required by Metro shall be copied to City of Renton Public Works Department, Attention: David M. Christensen.

SEE HAND  
EW METER AS OF  
10/24/90



W/P  
 Accy # 0301

APPLICATION ONLY - UNTIL VALIDATED

PERMIT NUMBER 724

Name <u>PUGET POWER</u>		Location of Work <u>6020 S. GRADY WAY</u>	
Address <u>6020 S. GRADY WAY</u> <u>RENTON WA. 98055</u>			
INSPECTIONS	CONSTRUCTION PERMIT (Public Right-of-Way)	FEES	
		Sanitary Sewer/Storm Water Permits <u>10000</u>	
		Right-of-Way Construction Right-of-Way Inspection Fees	
		Water Inspection/Approval Fee Special Utility Connection Fee, Water Water Latecomer Fee Special Assessment District, Water	
		Sewer Inspection/Approval Fees Special Utility Connection Fee, Sewer Sewer Latecomer Fee Special Assessment District, Sewer	
License Data		Special Deposit, Private Latecomer Special Deposit, Cash Bond	
		TOTAL FEE <u>10000</u>	

Description of Work INSTALLATION OF METER READING 55010.8  
 Number of Feet TEMPORARY SEWER

FROM TEMPORARY STORAGE TANKS TO EXIST. CURB  
WHOLE PER APPROVED SKETCH ATTACHED

Contractor <u>CHEMERD</u>	Business License <u>8639</u>
Address <u>3400 EAST MARSHALL WAY S.W.</u> <u>SEATTLE, WA. 98134</u>	Bond <u>Not Paid</u>
	Telephone <u>622-4678</u> <u>291-1320</u>

IT IS UNDERSTOOD THAT THE CITY OF RENTON SHALL BE HELD HARMLESS OF ANY AND ALL LIABILITY, DAMAGE OR INJURY ARISING FROM THE PERFORMANCE OF SAID WORK.

ANY WORK PERFORMED WITHIN THE RIGHT-OF-WAY OR ON SEWER MAIN MUST BE DONE BY A LICENSED, BONDED CONTRACTOR. LOCATE UTILITIES BEFORE EXCAVATING.

1 235-2631 FOR INSPECTION.  
 1 between 8 AM and 9 AM for  
 1 on in afternoon; call  
 1 e 12 Noon the day before  
 1 inspection in morning.  
 1 CITY TIME FOR INSPECTION.

APPLICANT [Signature]  
 PUBLIC WORKS DIRECTOR

1 235-2620 for street signs

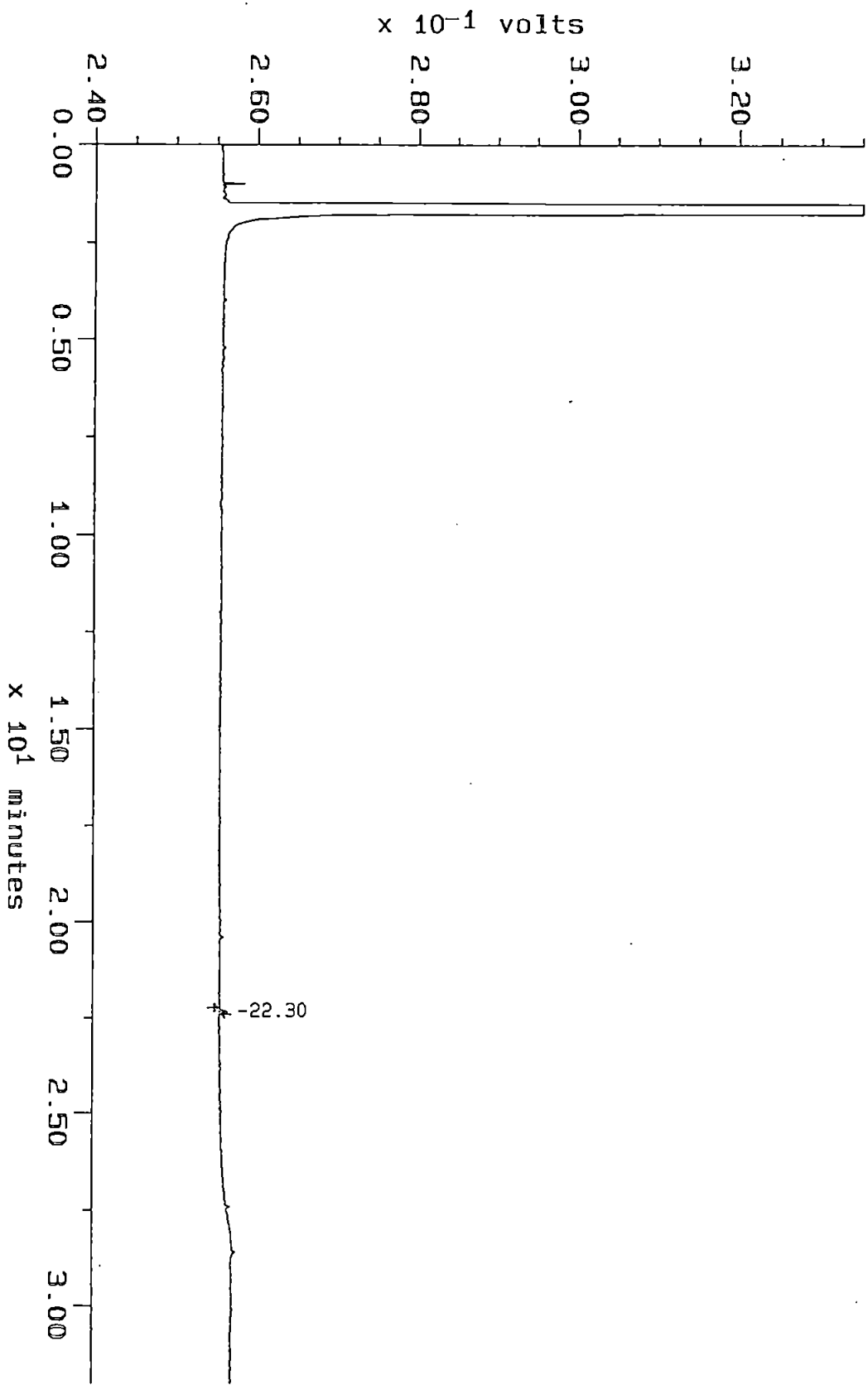
C - 9  
 CALL BEFORE YOU DIG  
 48-HOUR LOCATORS

BY [Signature]

Sample: 13588-1  
Acquired: 29-SEP-90 5:25  
Dilution: 1 : 10.000

Channel: detector 1  
Method: C:\MAX\DATA4\8015  
Amount: 9.872

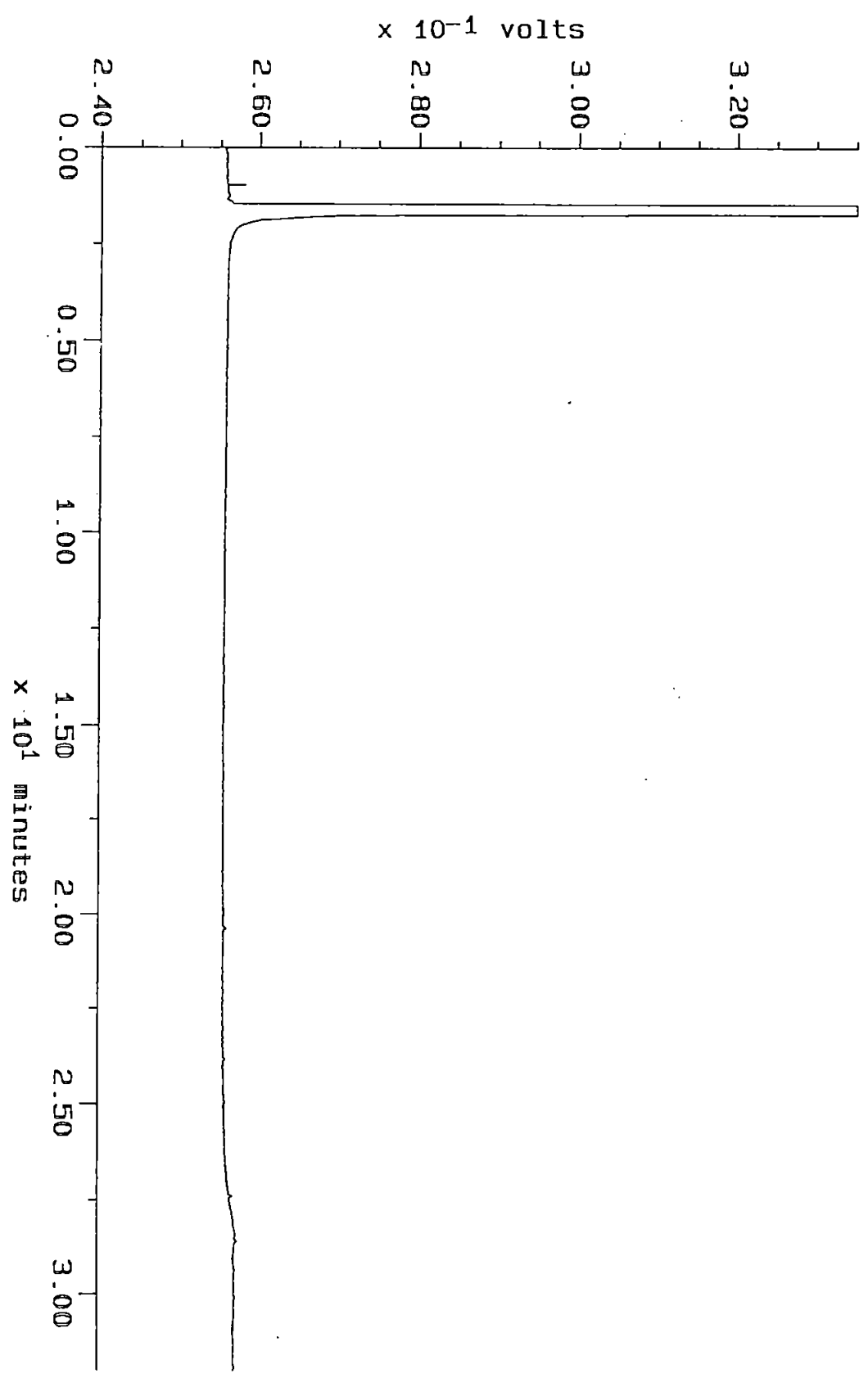
Filename: 13588-1  
Operator:



Sample: 13588-2  
Acquired: 29-SEP-90 6:11  
Dilution: 1 : 10.000

Channel: detector 1  
Method: C:\MAX\DATA4\8015  
Amount: 9.676

Filename: 13588-2  
Operator:



Filename: 13588-3

Operator:

Channel: detector 1

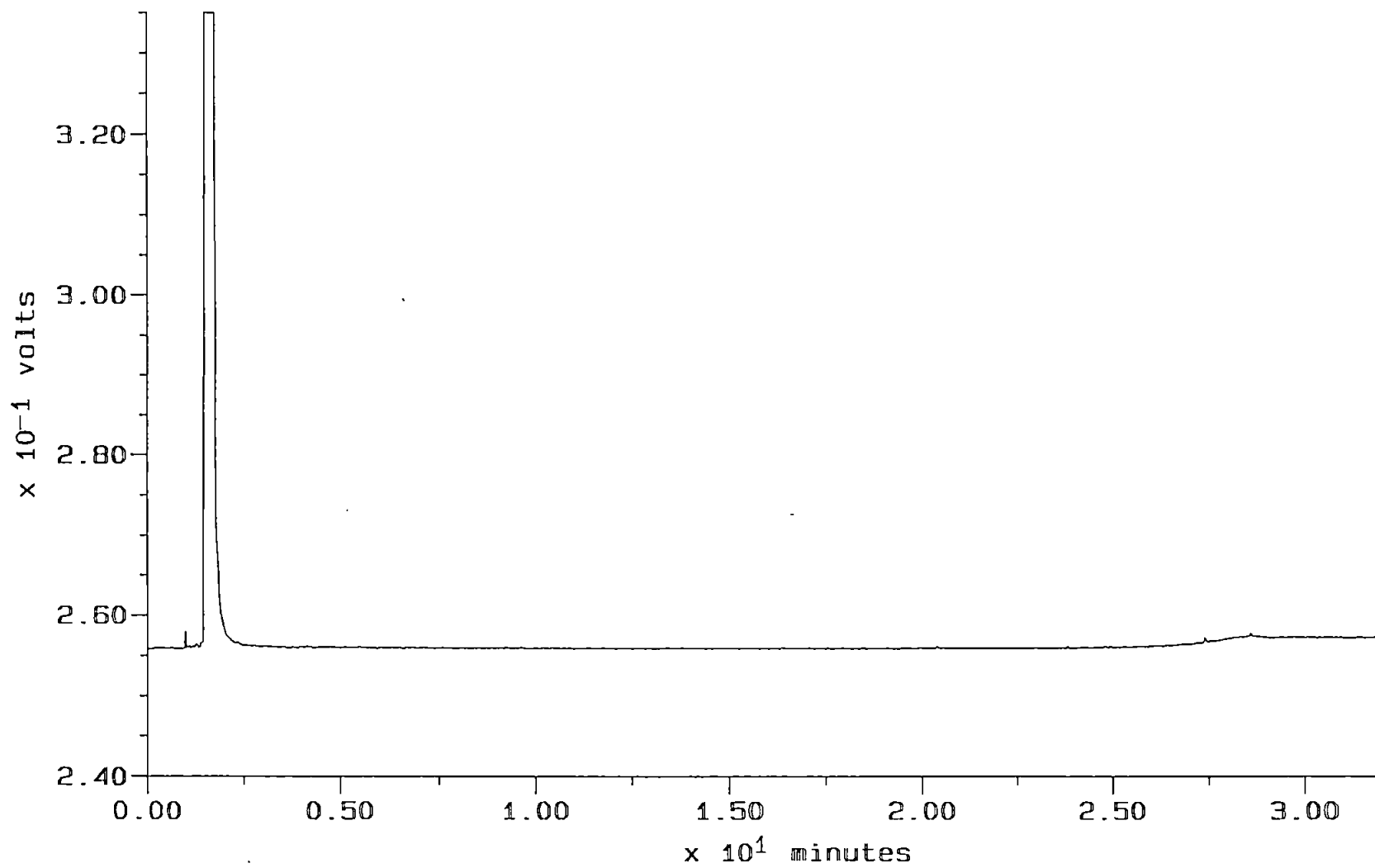
Method: C:\MAX\DATA4\8015

Amount: 9.219

Sample: 13588-3

Acquired: 29-SEP-90 6:57

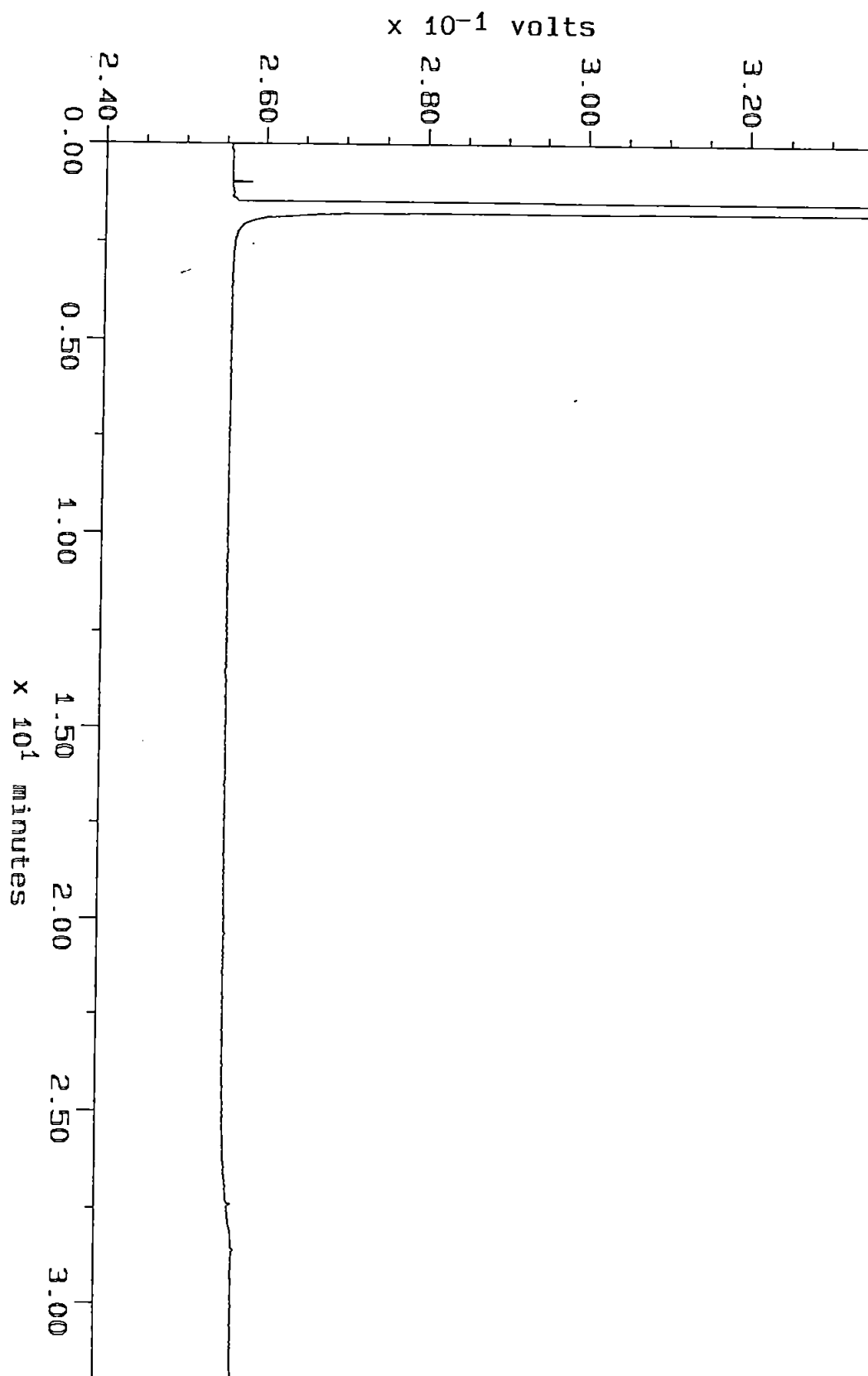
Dilution: 1 : 10.000



Sample: 13588-4  
Acquired: 29-SEP-90 7:44  
Dilution: 1 : 10.000

Channel: detector 1  
Method: C:\MAX\DATA4\8015  
Amount: 9.698

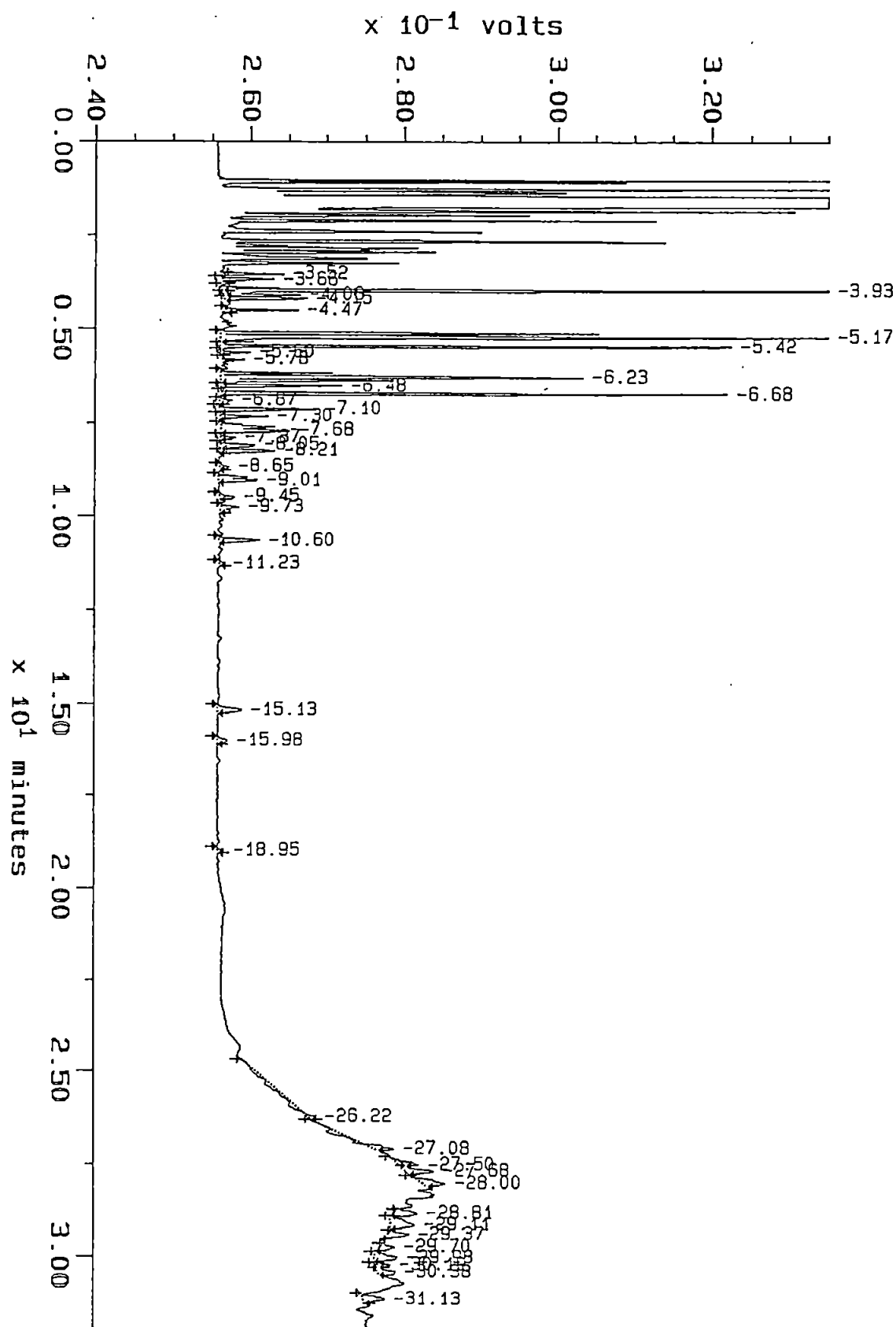
Filename: 13588-4  
Operator:



Sample: 500GAS  
Acquired: 29-SEP-90 13:56

Channel: detector 1  
Method: C:\MAX\DATA4\8015

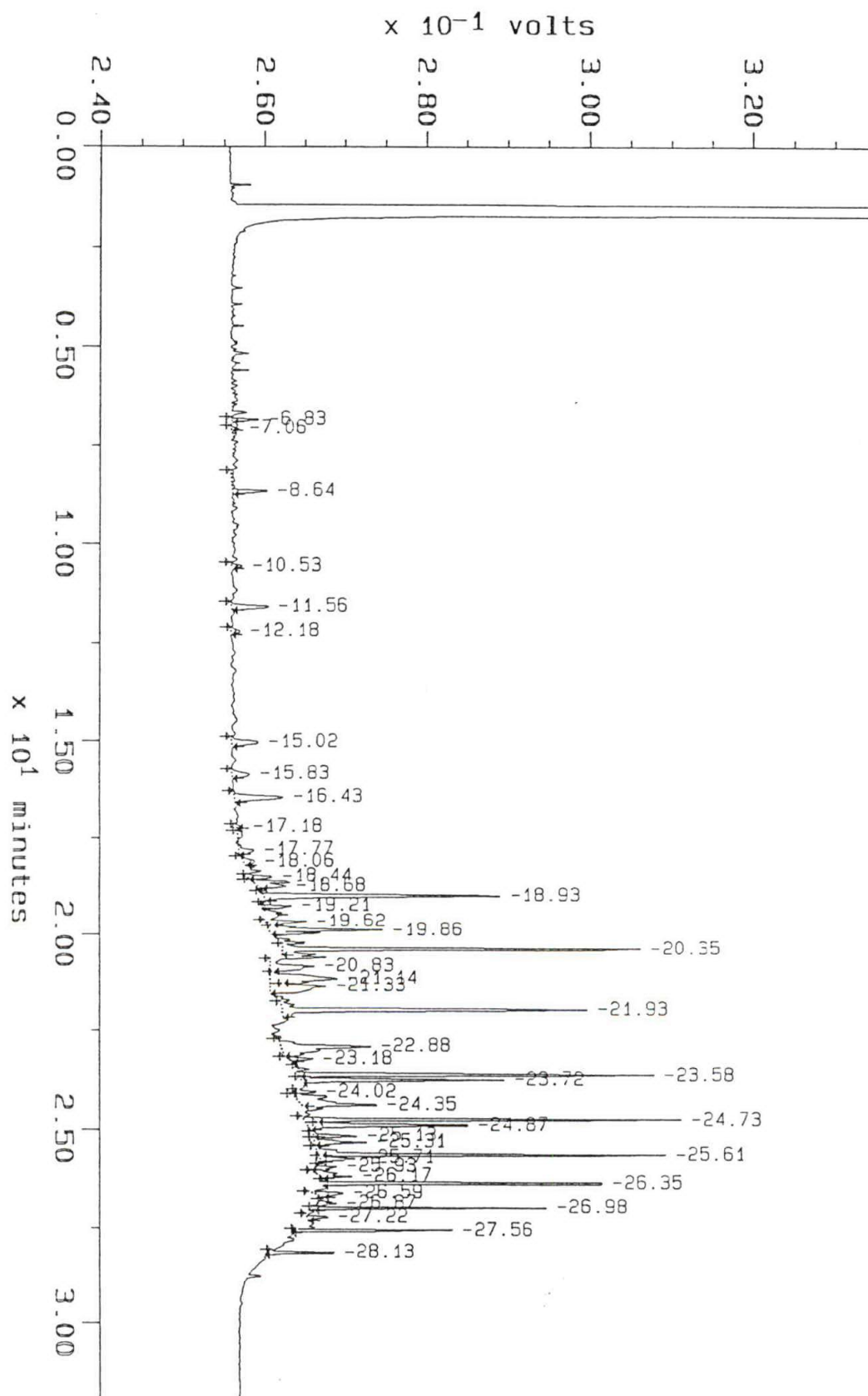
Filename: 500G2  
Operator:



Sample: 1000DIE S  
Acquired: 28-SEP-90 2:56

Channel: detector 1  
Method: C:\MAX\DATA4\8015CHRO

Filename: 1000D1  
Operator:



# SOUND ANALYTICAL SERVICES, INC.

SPECIALIZING IN INDUSTRIAL & TOXIC WASTE ANALYSIS

4630 PACIFIC HIGHWAY EAST, SUITE B-14, TACOMA, WASHINGTON 98424 - TELEPHONE (206)922-2310 - FAX (206)922-5047

Report To: GeoEngineers, Inc.

Date: October 1, 1990

Report On: Analysis of Soil

Lab No.: 13588

IDENTIFICATION:

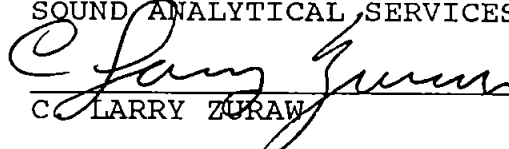
Samples Received on 09-28-90

Project: 0189-125-R369 Puget Power

ANALYSIS:

Lab Sample No.	RUSH 1	RUSH 2	RUSH 3	RUSH 4	RUSH 5
Client ID	900927 -1	900927 -2	900927 -3	900927 -4	900927 -5
Matrix/Units	Soil ppm	Soil ppm	Soil ppm	Soil ppm	Soil ppm
Benzene	< 0.05	< 0.05	0.11	< 0.05	0.15
Toluene	< 0.05	< 0.05	0.32	< 0.05	0.50
Ethyl Benzene	< 0.05	< 0.05	0.20	< 0.05	0.41
Xylenes	0.17	< 0.05	1.29	< 0.05	5.96
BTEX by EPA SW-846 Method 8020					
Total Petroleum Fuel Hydro- carbons by EPA SW-846 Modified Method 8015	< 10	< 10	< 10	< 10	< 10

SOUND ANALYTICAL SERVICES



LARRY ZURAW

# SOUND ANALYTICAL SERVICES, INC.

SPECIALIZING IN INDUSTRIAL & TOXIC WASTE ANALYSIS

4630 PACIFIC HIGHWAY EAST, SUITE B-14, TACOMA, WASHINGTON 98424 - TELEPHONE (206)922-2310 - FAX (206)922-5047

## QUALITY CONTROL REPORT

### DUPLICATES

Lab No: 13588  
Date: October 1, 1990  
Client: GeoEngineers, Inc.

Client ID: 900927-5  
Matrix: Soil  
Units: ppm

Compound	Sample(S)	Duplicate(D)	RPD*	
Benzene	0.15	0.13	14.3	
Toluene	0.50	0.53	5.8	
Ethyl Benzene	0.41	0.43	4.8	
Xylenes	5.96	5.77	3.2	
Total Petroleum Fuel Hydrocarbons	< 10	< 10	---	

\*RPD = relative percent difference  
=  $[(S - D) / ((S + D) / 2)] \times 100$