ENVIRONMENTAL SITE ASSESSMENT
FORMER CHEVRON SERVICE STATION #9-8944
1323 LEE BOULEVARD
RICHLAND, WASHINGTON

Prepared for

Mr. Rene White
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25 October 1994

12-01203-00

AGRA
Earth & Environmental

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FORMER CHEVRON SERVICE STATION #9-8944
1323 Lee Boulevard
Richland, Washington

12-1203-00

1.0 SUMMARY

The following report presents the results of our Environmental Site Assessment for the former Chevron Service Station No. 9-8944. The purpose of this investigation was to evaluate the subsurface soil and groundwater conditions with respect to potential hydrocarbon impact and to evaluate the lateral extent of the impacted soils and groundwater. The following summary presents the significant findings detailed in this report:

- The subsurface exploration program involved advancing three soil borings to depths of approximately 15 feet below grade and installing 2-inch diameter monitoring wells in each of the borings;

- Subsurface soil conditions encountered during the exploration program generally consisted of, in descending order, a thin layer of gravel fill, over fine sandy silt (loess), over a dense sandy gravel;

- At the time of our explorations, groundwater was encountered at depths of approximately 6 to 8 feet below grade. Once groundwater monitoring wells were installed, the depth to groundwater was measured between 6.10 and 7.63 feet below the top of the well casings. Shallow groundwater is interpreted to generally flow towards the east-northeast at an approximate gradient of 0.0027 ft/ft;

- Petroleum hydrocarbon concentrations exhibited by representative soil samples analyzed for this assessment are below method detection limits or below the Washington State Department of Ecology MTCA Method A action levels. Detectable concentrations of petroleum hydrocarbons typically were found in the sandy gravel below 12.0 feet;

- Dissolved phase hydrocarbons in groundwater beneath the subject site indicate purgeable hydrocarbon and aromatic hydrocarbon concentrations above Method A cleanup standards set forth in MTCA. Apparent extractable hydrocarbon concentrations above cleanup standards were also detected in groundwater samples in the three site monitoring wells;

- Interpretation of laboratory chromatograms by Chevron Research and Technology Center have determined the quantitative result within Method WTPH-D is representative of aged weathered gasoline.

2.0 SITE AND PROJECT DESCRIPTION

AGRA Earth & Environmental, Inc. performed an Environmental Site Assessment at former Chevron station No. 9-8944 located at 1323 Lee Boulevard in Richland, Washington (Figure 1). This work was authorized by Mr. Rene White of Chevron U.S.A. Products Co. in release number 1700890 and was performed to assess the subsurface at the property for the presence of petroleum hydrocarbons. Three exploratory wells were completed to a depth of approximately 15 feet and groundwater was encountered at depths 6.1 to 7.6 feet below the existing site grade.

In general accordance with the technical specifications provided by Chevron U.S.A. Products Company, the scope of work for the project consisted of the following:

1) Drilling and soil sampling three air rotary borings (MW-1 through MW-3) to a maximum depth of approximately 15 feet below the existing ground surface or five feet into the shallowest encountered groundwater above that depth. Install 2-inch I.D. monitoring wells in each of the explorations. Approximate boring/monitoring well locations are shown on the site plan, (Figure 2);

2 Collecting soil samples at depth intervals of approximately every five (5) feet and taking head space measurements using an OVM and presenting these measurements on the boring logs;

3) Performing quantitative chemical analyses of selected soil samples. Samples from the borings were analyzed for selected volatile aromatic hydrocarbons (benzene, toluene, ethylbenzene, and xylenes (BTEX)), and total petroleum hydrocarbons as gasoline (WTPH-G) and diesel (WTPH-D);

4) Preparing this summary report of our findings following receipt of the laboratory test results.

This report has been prepared for the exclusive use of Chevron U.S.A. Products Co. and their agents, for specific application to this site in accordance with generally accepted environmental assessment practices.

3.0 BACKGROUND

3.1 Facility Description

The subject site is an irregular shaped parcel of land which encompasses approximately one-half acre (24,500 square feet) located at 1323 Lee Boulevard in Richland, Washington (Figure 1). The property margins and the locations of the previous and existing structures, including the underground storage tanks (UST), were obtained from a site plan provided to AGRA by Chevron U.S.A., Inc. The approximate site plan is presented in Figure 2.

3.2 Local Land Use

The area to the south and southeast of the site is primarily residential. The area towards the east, north and west of the property is primarily commercial with intermittent residential areas. The site is bordered on the north by Lee Boulevard, on the west and south by Gillespie Avenue, and on the east by the Law Offices of Houger, Miller and Stein. East of the law offices is an Exxon gas station and west of the subject site, across Gillespie Avenue, is a former gas station which still contains pump islands and underground storage tanks.

3.3 Regional Geology/Hydrogeology

The study area lies in the east-central part of the Pasco Basin, which was formed by a slight structural downward in the otherwise relatively flat-lying sequence of basalt flows of the Columbia River Group. The basalt was laid down during Miocene time (26 million years before present) as widespread flows that were generated from numerous fissures located across southeastern Washington and southern Idaho. During the basalt extrusions, the Columbia and Snake Rivers periodically were pushed into new courses; evidence for ancient channels of these rivers is indicated by the presence of some river gravels interbedded with the basalt flows.

Several times during the Pleistocene "Ice Age", vast glaciers originating in Canada advanced into the northern part of the Columbia Plateau, northern Idaho, and Montana. Glacial meltwater streams from northern Washington, along with gigantic floods caused by sudden breakage of ice-damned lakes in the Selkirk and Rocky Mountains to the northeast of the Columbia Plateau (Glacial Lake Missoula) cut deep channels (coulees) across the Colombia Plateau. Occasionally, the water was partially impounded by both ice blocks and landslide debris in the lower Columbia River Valley, and by the restricted outlet from the Pasco Basin at Wallula Gap. Temporary large lakes formed in the vicinity of the study area, depositing silt and clay sediments within the river valleys. As the natural dams periodically broke, draining the lakes, the fine-grained lacustrine deposits were eroded by the flood waters. During the latter stages of the glacial period, thick accumulations of wind eroded fine-grained soil (loess) were deposited across the landscape of the plateau.

The geology of the subject site is characterized by these glaciofluvial and glaciolacustrine sediments deposited over basalt bedrock of the Columbia River Group. These sediments were originally deposited during the last major glacial advance which ended approximately 12,000 years ago. During this time, the thick intervals of flood sediments (chiefly cobbles, gravels, and sands) were deposited. After the glacial flood period ended, glacial deposits in the low lying areas of the drainage basin were reworked by local streams and rivers, chiefly the Columbia River at the subject site.

The soils located beneath the subject site consist of 7 to 8 feet of dry brown, fine sandy silts (Loess) over gravel with some cobbles in a sandy matrix. These gravelly soils were probably initially derived from the large floods which occurred approximately 12,000 years ago. Gravel at the site primarily consists of rounded basalt fragments and are clast supported in places. Since initial deposition of the coarse material, the sediments have been reworked by the Columbia River; the river's present

day coarse is located approximately 1/2 mile east of the subject site. Wind blown silt, (loess) was later deposited over the glaciofluvial deposits. The Columbia River is presently dammed by the McNary Dam, which forms Lake Wallula east of the site. Shallow groundwater beneath the site appears connected with the current lake water table and fluctuates seasonally with river and lake levels.

The Columbia River Basalt Group hosts the area's regional aquifer system. These basalt flows compose a multilayered aquifer system with major aquifers located within the basalt interbeds (which typically average 5 to 30 percent of the total flow thickness). General regional groundwater flow is to the south. Some aquifers are connected hydraulically through vertical fractures or columnar jointing within the thinner basalt flows. These deep aquifers are the predominant water source for most municipal, industrial, domestic, and agricultural needs. Locally, shallow perched aquifers may exist. The shallow aquifer beneath the site occurs at a depth of approximately 8 feet below grade and appears to be part of the Lake Wallula water system. Drinking and industrial water for the City of Richland is primarily derived directly from the Columbia River. The City also maintains 18 deep wells (approximately 120 to 150 feet deep) placed in five separate well field locations around the city which supply drinking water. These wells are founded within the unconsolidated sediments except for one well which is located south of Richland and is founded within a basalt interflow at a depth of approximately 1,200 feet. The closest well field to the subject site is the Wellsian Way well field located approximately 1,500 feet southwest of the subject site. This well field is currently not in use due to the presence of chlorinated solvents detected within the ground water.

3.4 Previous Site Environmental investigations

A Phase I and Limited Phase II Environmental Site Assessment was conducted at the subject site by Technico Environmental Services of Kennewick, Washington in July 1994. This assessment was completed by the current owner of the property for Sam Volpentest of Prudential NOW Reality. The assessment encompassed a typical Phase I site investigation and included the collection and analytical testing of on-site soils and of groundwater samples beneath the subject site.

4.0 METHODS

4.1 Subsurface Exploration

The field exploration program conducted for this study consisted of advancing a series of three borings, to depths of approximately 15 feet below the existing site grade. Prior to drilling, exploration locations were cleared by meeting with the various utility companies at the site and locating the respective utilities. The approximate locations of the explorations are illustrated on the Site and Exploration Plan, Figure 2. The borings were drilled on 10 and 11 September 1994 by Ruen Drilling of Clarkfork, Idaho under subcontract to our firm. Each boring was advanced using a truck mounted Schramm drill rig. Six-inch inside diameter (I.D.) threaded steel casing was used on all borings completed. Prior to drilling, all downhole equipment was decontaminated by steam cleaning methods. During the drilling process, samples were generally obtained at 5 foot depth intervals. The borings were continuously observed and logged by a geologist from our firm.

4.2 Characterization of Soils

Soil samples were obtained using the Standard Penetration Test Procedure as described in ASTM: D-1586. This testing and sampling method consists of driving a standard 2-inch outside diameter steel split barrel sampler a distance of 18-inches into the soil below the auger bit with a 140 pound hammer free-falling a distance of 30 inches. The number of blows for each 6-inch interval is recorded and the number of blows required to drive the sampler the final 12 inches is considered the Standard Penetration Resistance ("N") or blow count which is represented on the boring logs presented in Appendix A. If a total of 50 counts is recorded within a 6-inch interval, the blow count is recorded as 50 blows for the number of inches of penetration. The blow count, or "N" value, provides a measure of the relative density of granular soils or the relative consistency of cohesive soils. The high gravel, cobble and boulder content of some fluvial and glacial soils often times prevent consistent or satisfactory standard penetration testing. The soil samples were retrieved from a split-spoon sampler fitted with a plastic catcher, classified in the field and a representative portion placed in laboratory prepared air tight glass containers.

The boring logs presented in Appendix A are based on the drilling action, visual inspection of the samples secured, laboratory results, and field logs. The various types of soils are indicated, as well as the depths where soils or characteristics of the soils changed. It should be noted that these changes may have been gradual, and if the changes occurred between sample intervals, contacts between units are interpreted. Subsurface water conditions are evaluated by observing the moisture condition of the samples, the free water on the sample rods, and in well measurements. Groundwater was encountered at the time of drilling at depths ranging from six to eight feet below the existing site grade.

4.3 Decontamination Procedures

The soil samples were recovered at each interval using procedures designed to minimize the risk of cross contamination. Prior to each boring, the drilling equipment and sampling tools were washed using a high pressure steam cleaner. Between each sampling attempt, the sampling tools were scrubbed with a stiff brush and a detergent solution consisting of Liquinox and warm water, and then rinsed with potable water and liberal quantities of deionized water. The samples were classified in the field and immediately transferred to laboratory-treated glass jars, and tightly sealed with a teflon-lined threaded cap. Samples were screened in the field with a portable Organic Vapor Meter (OVM) and representative samples were selected for laboratory analysis. Samples were stored and transported in a chilled ice chest throughout the field program. Selected soil samples were subsequently transferred to Analytical Technologies Inc. of Renton, Washington in accordance with AGRA Earth and Environmental, Inc. chain of custody procedures.

4.4 Field Headspace Measurement Procedures

Each soil sample was screened for the presence of volatile organic compounds to facilitate selecting an appropriate soil sample to submit for chemical analysis, except when the sample recovery was too small, in our opinion, to provide reliable data. This involved placing approximately 3.5 ounces

of sampled soil directly into one pint sandwich bags with ziplock seals. The sample was then shaken vigorously for approximately 15 seconds and a head space measurement was taken after inserting the OVM detector probe into an opening in the ziplock seal. Field head space analysis was performed on each sample utilizing a Model 580A OVM. The highest digital readout value displayed by the instrument was recorded for each sample. This value indicates the total concentration of volatilized organic compounds. These compounds include numerous constituents of petroleum hydrocarbons. However, the OVM is not capable of determining the species of these compounds or their concentrations in the soil samples. Consequently, it should be considered merely a rough screening tool that aids in detecting the presence of volatile organic compounds in soil. For the purpose of this study, field organic vapor measurements greater than 0.0 parts per million (ppm) are consisted to be above the natural, ambient background concentration. Results of field analysis are presented in Table 1 and on the boring logs in Appendix A. Samples were selected for laboratory analysis based on depth and field screening measurements.

4.5 Monitoring Well Installation and Development

Three borings were completed for the purpose of installing site monitoring wells. The casing was advanced into the subsurface until the desired depth of approximately seven feet beneath the groundwater interface. Ten feet of 2-inch inside diameter Schedule-40 PVC well screen (with 0.020 slots) attached to blank Schedule 40 PVC pipe was installed inside the casing. The casing annulus was then filled periodically with a select sand filter pack and slowly withdrawn to allow the sand to surround the well screen and fill the annulus of the boring to approximately two to three feet above the well screen. A seal consisting of bentonite was then placed in the hole to a depth approximately 2 feet below the ground surface. Grout was then placed above the bentonite seal to a depth of approximately 1 foot below the ground surface. Each well was completed by installing a locking cap in the top of the blank PVC pipe and cementing in a flush mounted steel well monument.

5.0 RESULTS OF THE ASSESSMENT

5.1 Groundwater Conditions

Groundwater was encountered at depths ranging from 6 to 8 feet below the existing site grade. Following well development, the monitoring wells were allowed to equilibrate for approximately 24 hours before obtaining groundwater elevation measurements. Based upon water level measurements collected on 11 August 1994, the depth to water from the top of casing ranged from 6.10 to 7.63 feet. A representative from AGRA also visited the site on 25 August and 23 September 1994 to collect water level measurements. Groundwater depths during the most recent site visit ranged from 6.11 to 7.59 feet below the top of casing. No free phase liquid hydrocarbon (LHC) was measured in any of the wells installed for this study.

The top of casing and ground surface elevations were measured by a representative of AGRA E & E on 11 August 1994 using optical differential leveling techniques. All elevations were referenced to a site relative datum. Based on the survey data and the measurements of 11 August 1994, an approximate groundwater gradient of 0.0027 ft/ft (0.27 foot vertical fall in 100 feet horizontal) was calculated, with groundwater flow trending towards the east-northeast. Measurements of water levels collected on 25 August 1994 determined that groundwater was migrating towards the east-northeast under an approximate hydraulic gradient of 0.002 ft/ft. Groundwater depths and elevations are presented in Table 2 for both monitoring events.

5.2 Soil Analyses

The subsurface beneath the site was evaluated for the presence of fugitive petroleum hydrocarbons using obvious indications such as sheen, discoloration, field organic vapor head space measurements and quantitative analytical testing of selected soil samples. Soil samples analyzed were selected based on field observations, PID screening measurements and depth.

5.2.1 Soil Field Screening and Analytical Results

OVM headspace measurements are presented in Table 1 and on the boring logs in Appendix A. All headspace measurements collected exhibited readings greater than 0.0 ppm, except for soil sample MW-1 S-1, MW-2 S-1 and MW-3 S-2 which exhibited field headspace measurements of 0.0 ppm. Table 1 presents a summary of field headspace measurements collected from soil samples obtained during the drilling phase of this project.

5.2.2 Analytical Methods and Results

The analytical testing procedures used for this assessment are in general accordance with those recommended by the Washington State Department of Ecology (Ecology) for assessment of underground storage tanks. Total petroleum hydrocarbons in the gasoline and diesel range (C_6 to C_{30}) were identified using WTPH-G/BTEX and WTPH-D, respectively. The results of the analyses are presented on the laboratory test certificates presented in Appendix B. All soil results are presented in milligrams per kilogram (mg/kg) concentrations (ppm). A total of six soil samples were submitted for chemical analysis on 11 September 1994 following the drilling event. Table 3 presents a summary of analytical testing of soil samples submitted during this phase of the project.

Detectable concentrations of purgeable hydrocarbons as determined by Ecology Method WTPH-G were found in soil samples MW-1 S-3 and MW-2 S-3. However, these concentrations are below the Model Toxics Control Act (MTCA) clean up criteria of 100 ppm. No detectable concentrations of purgeable hydrocarbons were found in the remaining soil samples submitted.

No detectable concentrations of benzene were found in any of the six soil samples submitted for analytical testing. The laboratory detection limit for benzene is 0.033 ppm. Detectable concentrations of toluene were found in one sample submitted from well MW-2 (sample S-3). However, this sample did not contain toluene concentrations in excess of the cleanup standard of 40 ppm set forth in Method A of MTCA. Detectable concentrations of ethylbenzene and xylenes were found in two soil samples collected from MW-1 and MW-2. None of the samples contained ethylbenzene or xylene concentrations in excess of the cleanup standard of 20 ppm set forth in Method A of MTCA.

Detectable concentrations of extractable hydrocarbons were found in soil samples collected from MW-2 and MW-3. However, none of the soil samples exhibited detectable concentrations of the diesel range hydrocarbons in excess of the cleanup standard of 200 ppm set forth in Method A of MTCA. The highest concentration of suspect diesel range hydrocarbons was 54.0 ppm collected at a depth of 4.5 to 6.0 feet in boring MW-3. Chromatogram interpretation and analysis of dissolved phase hydrocarbons in groundwater by Chevron Research and Technology Company (CRTC) have determined that the diesel range hydrocarbons quantified by the analytical laboratory (Analytical Technologies, Inc. of Renton, Washington) may be representative of an aged weathered gasoline. Chevron records have indicated that no diesel has been sold or used as a fuel at the subject site, therefore, the detection of diesel range hydrocarbons is likely a phenomena

of the weathered gasoline. Discussion of the CRTC interpretation in the groundwater sample submitted is presented in section 5.3.1 of this report.

5.3 Groundwater Analysis

One groundwater sample was collected from each of the three monitoring wells and was submitted to Analytical Technologies Inc. laboratory in Renton, Washington. Each sample was analyzed for purgeable petroleum hydrocarbons by Ecology Method WTPH-G, extractable petroleum hydrocarbons by Ecology Method WTPH-D and aromatic hydrocarbons (BTEX) by EPA Method 8020. Table 4 presents a summary of analytical test results of groundwater samples collected on 11 August 1994.

Detectable levels of purgeable hydrocarbons were found in monitoring wells MW-1, MW-2 and MW-3. All results were in excess of the cleanup standard of 1,000 ppb set forth in Method A of MTCA. Monitoring well MW-3 exhibited the highest concentration of the three wells at 27,000 ppb. Benzene concentrations in these wells also exceed the cleanup standard of 5 ppb set forth in Method A of MTCA. Ethylbenzene and xylene concentrations in the three wells also exceed the cleanup standards. Toluene concentrations in MW-2 and MW-3 exceed the cleanup standard. However, the detectable toluene concentration in MW-1 was below the cleanup standard of 40.0 ppb set forth in Method A of MTCA.

Extractable hydrocarbon concentrations were also reported in all three samples submitted for analytical testing. All samples exhibited diesel concentrations in excess of the cleanup standard of 1.0 ppm set forth in Method A of MTCA. Monitoring well MW-2 contained the highest concentration of 5.8 ppm.

Results of the laboratory QA/QC duplicate and spike samples were within the quality assurance/quality control allowable limits. A summary of the laboratory analysis performed for the submitted groundwater samples is presented in Table 4. Analytical test certificates are presented in Appendix B.

5.3.1 Chromatogram Interpretation

Chevron records indicated that no diesel hydrocarbons were sold or utilized at the former service station. Therefore, diesel concentrations detected by the analytical laboratory were suspect. On 23 September 1994, a representative from our firm visited the subject site to collect a second groundwater sample from monitoring well MW-2. The purpose of this second sampling event was to determine if the diesel identification in the groundwater was represented of an aged gasoline. Approximately 3 well volumes were removed from MW-2 prior to sampling. The groundwater sample was sent to Chevron Research and Technology Company (CRTC) to determine if dissolved phase hydrocarbons originally quantified within the diesel range were actually aged/weathered gasoline. CRTC determined that the dissolved phase hydrocarbons located beneath the subject site are aged gasoline and no diesel was present. Sample MW-2 contained 7.6 mg/L of gasoline (C_5 to C_{14}). No isoprenoid hydrocarbons, which would indicate diesel (even in the absence of normal paraffins) are present. A copy of Chevron's report is included in Appendix C.

6.0 CLOSURE

Information contained within this report is based upon the site characterization, field observations, and the laboratory analyses accomplished for this study. Conclusions presented are professional opinions based upon our interpretation of the analytical laboratory test results, as well as our experience and observations during the

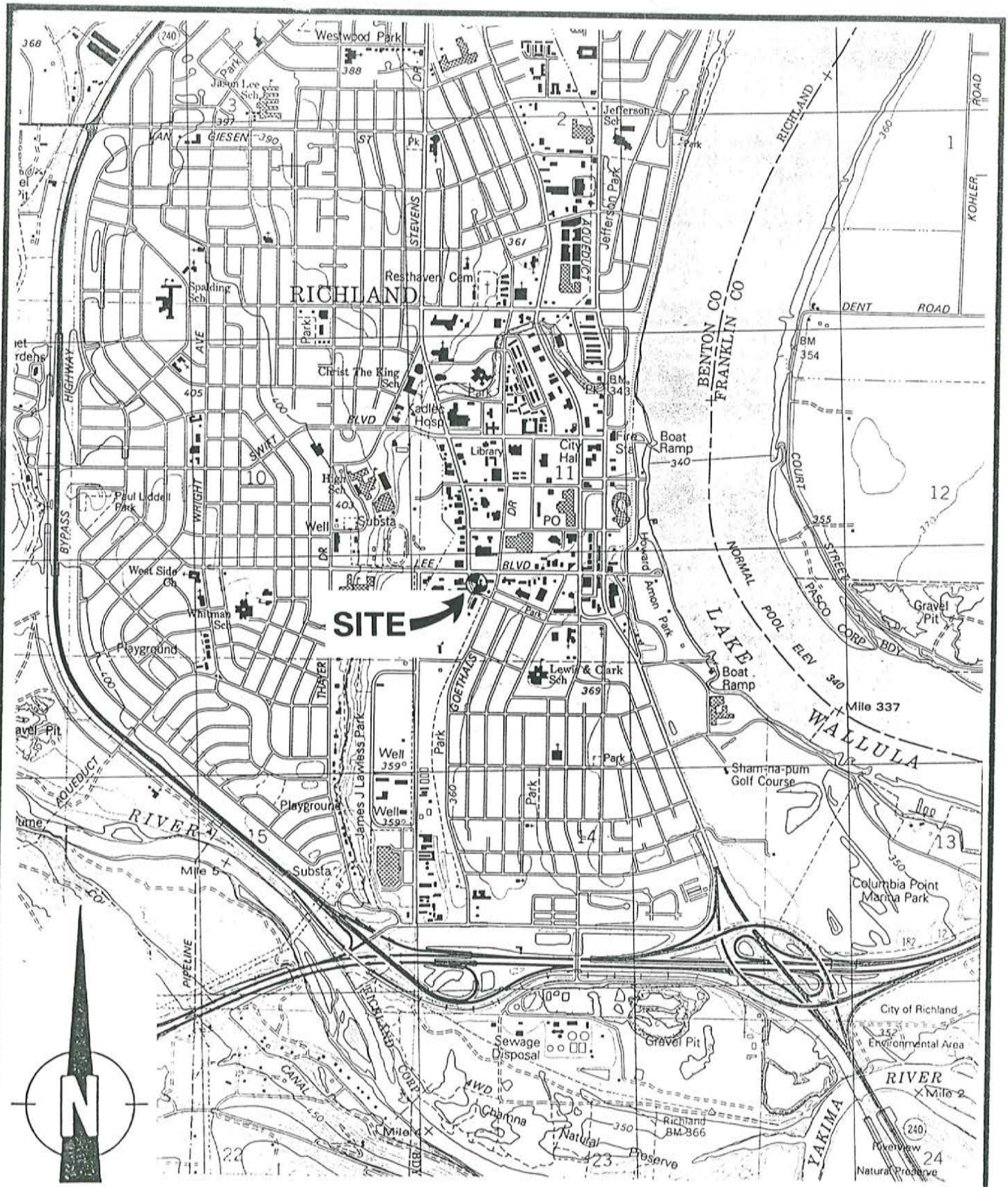
project field characterizations. The number, locations, and depth of explorations during the characterization program, including the analytical testing scope, were completed within the site and proposal constraints so as to yield the information utilized to formulate our conclusions.

We appreciate the opportunity to be of continuing service to Chevron U.S.A. Products Company. Should you have any questions regarding this project, please call us at your earliest convenience.

Respectfully submitted,
AGRA Earth & Environmental, Inc.

Eugene N.J. St.Godard, P.G.
Project Hydrogeologist

Jon N. Sondergaard, P.G., R.E.A.
Associate



RZA AGRA, INC.
Engineering & Environmental Services

Georgetown Office Building
539 West Sharp
Suite D
Spokane, WA 99201

W.O.	S-1203-0
DESIGN	ENJS
DRAWN	ENJS
DATE	SEPT 1994
SCALE	1" = 2,000'

FIGURE 1
SITE VICINITY MAP
FORMER CHEVRON STATION NO. 9-8944
RICHLAND, WASHINGTON

GENDRON'S

LEE BLVD.

MW-3 94.57 / 86.98

(FORMER PUMP ISLAND)

(FORMER PUMP ISLAND)

FORMER SERVICE STATION

MW-1 93.98 / 86.98

APPROXIMATE PROPERTY BOUNDARY

SIDEWALK

FORMER TANK PIT

(FORMER PUMP ISLAND)

MW-2 93.21 / 87.10

GILLISPIE ST.

LEGEND

MW-1 — APPROXIMATE MONITORING WELL LOCATION AND NUMBER

93.88 / 86.98 — TOP OF CASING ELEVATION / GROUNDWATER ELEVATION AS MEASURED 8/25/94

INFERRED GROUNDWATER MIGRATION DIRECTION

N

0 10 20

SCALE IN FEET

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Georgetown Office Building
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Suite D
Spokane, WA 99201

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DESIGN	ENJS
DRAWN	ENJS
DATE	SEPT 1994
SCALE	NOTED

FIGURE 2

SITE PLAN

FORMER CHEVRON STATION NO. 9-8944

RICHLAND, WASHINGTON

152284

GENDRON'S

12-1203-00

ENVIRONMENTAL SITE ASSESSMENT

FORMER CHEVRON SERVICE STATION NO. 9-8944

RICHLAND, WASHINGTON

TABLE 1: SUMMARY OF FIELD HEADSPACE MEASUREMENTS

WELL NO.	SAMPLE NO.	DEPTH (FT)	OVM (PPM)
MW-1	S-1	4.5 - 6.0	0.0
MW-1	S-2	9.5 - 11.0	3.9
MW-1	S-3	13.5 - 15.0	368.0
MW-2	S-1	4.0 - 5.5	0.0
MW-2	S-2	9.0 - 10.5	27.6
MW-2	S-3	14.5 - 16.0	40.7
MW-3	S-1	4.5 - 6.0	1.3
MW-3	S-2	8.5 - 10.0	0.0
MW-3	S-2	14.0 - 15.5	365.0

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ENVIRONEMNTAL SITE ASSESSMENT

FORMER CHEVRON SERVICE STATION NO. 9-8944

RICHLAND, WASHINGTON

TABLE 2: SUMMARY OF FLUID LEVEL MEASUREMENTS

WELL NO.	DATE	CASING ELEVATION	DEPTH TO WATER (FT)	GROUNDWATER ELEVATION (FT)
MW-1	8/11/94	93.98	7.03	86.95
MW-1	8/25/94	93.98	7.00	86.98
MW-1	9/23/94	93.98	7.00	86.98
MW-2	8/11/94	93.21	6.10	87.11
MW-2	8/25/94	93.21	6.11	87.10
MW-2	9/23/94	93.21	6.11	87.10
MW-3	8/11/94	94.57	7.63	86.94
MW-3	8/25/94	94.57	7.59	86.98
MW-3	9/23/94	94.57	7.59	86.98

12-1203-00
ENVOIRONEMNTAL SITE ASSESSMENT
FORMER CHEVRON SERVICE STATION NO. 9-8944
RICHLAND, WASHINGTON

TABLE 3: SUMMARY OF ANALYTICAL TESTING OF SOILS

SAMPLE NO.	DATE	DEPTH (FT)	BENZENE (PPM)	TOLUENE (PPM)	ETHYLBENZENE (PPM)	XYLENES (PPM)	WTPH-G (PPM)	*WTPH-D (PPM)
MW-1 S-1	8/10/94	4.5-6.0	ND	ND	ND	ND	ND	ND
MW-1 S-3	8/10/94	13.5 - 15.0	ND	ND	0.067	0.12	35.0	ND
MW-2 S-1	8/11/94	4.0 - 5.5	ND	ND	ND	ND	ND	ND
MW-2 S-3	8/11/94	14.5 - 16.0	ND	0.07	0.14	0.37	77.0	13.0
MW-3 S-1	8/10/94	4.5 - 6.0	ND	ND	ND	ND	ND	54.0
MW-3 S-3	8/10/94	8.5 - 10.0	ND	ND	ND	ND	ND	**ND**
MTCA METHOD A CCL'S			**0.5**	**40.0**	**20.0**	**20.0**	**100.0**	**200.0**

WTPH-D quantitative results are indicative of an aged/weathered gasoline and are not diesel range hydrocarbons

TABLE 4: SUMMARY OF ANALYTICAL TESTING OF GROUNDWATER

SAMPLE NO.	DATE	BENZENE (ug/l)	TOLUENE (ug/l)	ETHYLBENZENE (ug/l)	XYLENES (ug/l)	WTPH-G (ug/l)	*WTPH-D (mg/l)
MW-1	8/11/94	7.2	6.3	50.0	250.0	5800	2.4
MW-2	8/11/94	110.0	69.0	290.0	970.0	20000	5.8
MW-3	8/11/94	22.0	90.0	520.0	2400.0	27000	3.0
MTCA METHOD A CCL'S		**5.0**	**40.0**	**30.0**	**20.0**	**1000**	**1.0**

*WTPH-D quantitative results are indicative of an aged/weathered gasoline and are not diesel range hydrocarbons

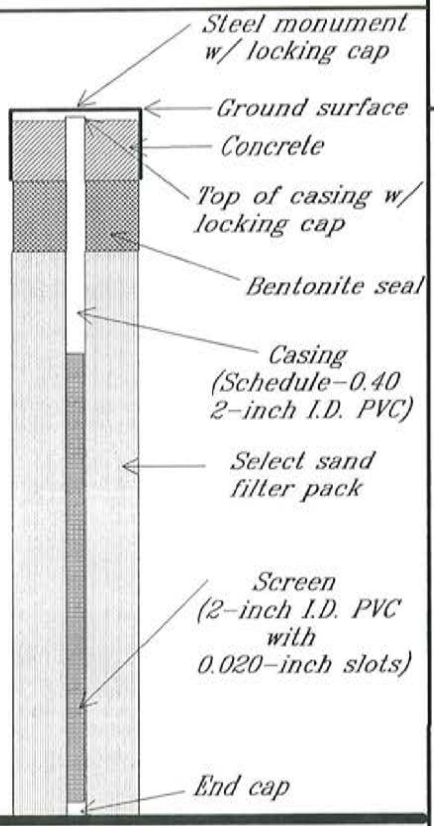
APPENDIX A
BORING LOGS

PROJECT *Former Chevron Station No. 9-8944* W.O. *12-1203-00* WELL NO. *MW-1*

Elevation reference:
Ground surface elevation: *94.60* Casing elevation: *93.98*

DEPTH (feet)	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	BLOW COUNTS	OVM READING (ppm)	GROUND WATER
0	*0-2" Asphalt* *Gravel FILL*					
5	*Medium stiff, moist, brown fine sandy SILT (LOESS)*		S-1	5	0.0	
						ATD
10	*Medium dense, saturated, brown sandy GRAVEL with slight hydrycarbon-like odor (glaciofluvial)*		S-2	32	3.9	
	--stained soil, aged gas/diesel odor					
	Very dense, saturated, brown/black medium to coarse sandy GRAVEL with hydrocarbon-like odor		S-3	74	368	
15	*Boring terminated at approximately 15 feet*					
20						
25						
30						

AS-BUILT DESIGN



TESTING

LEGEND

2-inch O.D. split-spoon sample (pushed)

Observed groundwater level (ATD = at time of drilling)

AGRA
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W. 539 Sharp, Suite D
Spokane, Washington 99201

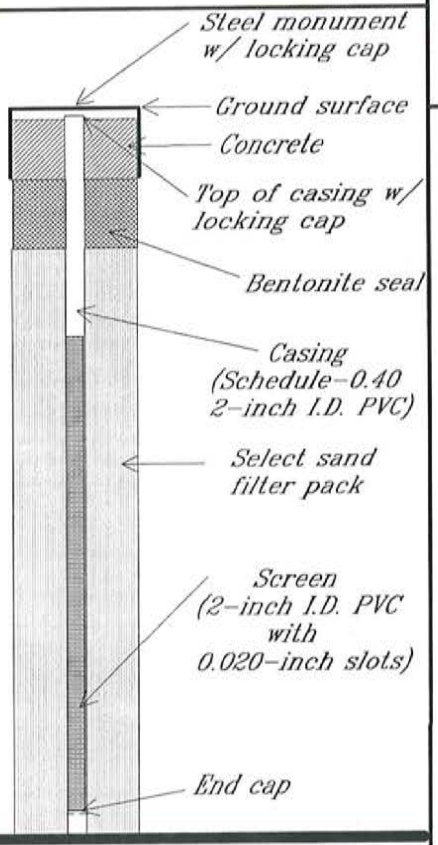
Drilling started: *10 September 1994* Drilling completed: *10 September 1994* Logged by: *ENJS*

PROJECT *Former Chevron Station No. 9-8944* W.O. *12-1203-00* WELL NO. *MW-2*

Elevation reference:
Ground surface elevation: *93.86* Casing elevation: *93.21*

DEPTH (feet)	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	BLOW COUNTS	OVM READING (ppm)	GROUND WATER
0	*0-2" Asphalt* *Gravel FILL*					
5	*Soft, moist to wet, brown fine sandy SILT (LOESS)*		S-1	2	1.3	ATD
10	*Dense, saturated, brownish black sandy GRAVEL (glaciofluvial)* *-- aged gas/diesel odor*		S-2	34	0.0	
15	*Medium dense, saturated, brownish black sandy GRAVEL*		S-3	21	365	
20	*Boring terminated at approximately 15.5 feet*					
25						
30						

AS-BUILT DESIGN



TESTING

LEGEND

I 2-inch O.D. split-spoon sample (pushed)

▽ ATD Observed groundwater level (ATD = at time of drilling)

AGRA
Earth & Environmental
W. 539 Sharp, Suite D
Spokane, Washington 99201

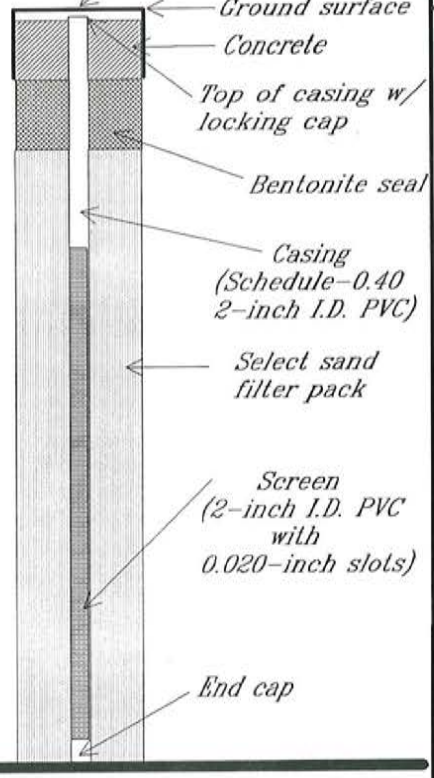
Drilling started: *11 September 1994* Drilling completed: *11 September 1994* Logged by: *ENJS*

PROJECT *Former Chevron Station No. 9-8944* W.O. *12-12[illegible]-00* WELL NO. *MW-3*

Elevation reference:
Ground surface elevation: *95.13* Casing elevation: *94.57*

DEPTH (feet)	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	BLOW COUNTS	OVM READING (ppm)	GROUND WATER
0	*Silt with debris (FILL)*					
	Brown fine to medium SAND with some gravel and silt (FILL)					
5	*Medium stiff, dry, brown to tan fine sandy SILT (Loess)*		S-1	7	0.0	
						ATD
10	*Dense, saturated, grayish brown, sandy GRAVEL with slight hydrocarbon-like odor*		S-2	47	27.6	
	--Stained soil, sandy GRAVEL with hydrocarbon-like odor, possible aged gasoline/diesel					
15	*Dense, saturated, brown sandy GRAVEL with some cobbles and hydrocarbon-like odor*		S-3	21	40.7	
	Boring terminated at approximately 16 feet					
20						
25						
30						

AS-BUILT DESIGN



TESTING

LEGEND

2-inch O.D. split-spoon sample (pushed)

ATD Observed groundwater level (ATD = at time of drilling)

AGRA
Earth & Environmental
W. 539 Sharp, Suite D
Spokane, Washington 99201

Drilling started: *10 September 1994* Drilling completed: *10 September 1994* Logged by: *ENJS*

APPENDIX B
ANALYTICAL TEST CERTIFICATES

Analytical Technologies, Inc.
560 Naches Avenue, S.W., Suite 101, Renton, WA 98055 (206) 228-8335
Karen L. Mixon, Laboratory Manager

ATI I.D. # 408126

August 26, 1994

AGRA Earth & Environmental
539 W. Sharp
Suite D
Spokane WA 99201

Attention : Gene St. Godard

Project Number : 12-01203

Project Name : Chevron-1323 Lee Blvd./Richland

Dear Mr. St. Godard:

On August 12, 1994, Analytical Technologies, Inc. (ATI), received 12 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.

Please note that this report has a summary report for the fuels analyses. If you have any questions, please call.

Sincerely,

Elaine M. Walker

Elaine M. Walker
Project Manager

EMW/hal/ff

Enclosure

Analytical Technologies, Inc.

ATI I.D. # 408126

SAMPLE CROSS REFERENCE SHEET

CLIENT : AGRA EARTH & ENVIRONMENTAL
PROJECT # : 12-01203
PROJECT NAME : CHEVRON-1323 LEE BLVD./RICHLAND

ATI #	CLIENT DESCRIPTION	DATE SAMPLED	MATRIX
408126-1	MW-1 S-1	08/10/94	SOIL
408126-2	MW-1 S-3	08/10/94	SOIL
408126-3	MW-2 S-1	08/11/94	SOIL
408126-4	MW-2 S-2	08/11/94	SOIL
408126-5	MW-2 S-3	08/11/94	SOIL
408126-6	MW-3 S-1	08/10/94	SOIL
408126-7	MW-3 S-2	08/10/94	SOIL
408126-8	MW-3 S-3	08/10/94	SOIL
408126-9	MW-1	08/11/94	WATER
408126-10	MW-2	08/11/94	WATER
408126-11	MW-3	08/11/94	WATER
408126-12	TRIP BLANK	N/A	WATER

----- TOTALS -----

MATRIX	# SAMPLES
SOIL	8
WATER	4

ATI STANDARD DISPOSAL PRACTICE

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

Analytical Technologies, Inc.

ATI I.D. # 408126

ANALYTICAL SCHEDULE

CLIENT : AGRA EARTH & ENVIRONMENTAL
PROJECT # : 12-01203
PROJECT NAME : CHEVRON-1323 LEE BLVD./RICHLAND

ANALYSIS	TECHNIQUE	REFERENCE	LAB
BETX/MTBE	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 ILM01.0	R

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

Analytical Technologies, Inc.

ATI I.D. # 408126

GENERAL CHEMISTRY ANALYSIS

CLIENT : AGRA EARTH & ENVIRONMENTAL MATRIX : SOIL
PROJECT # : 12-01203
PROJECT NAME : CHEVRON-1323 LEE BLVD./RICHLAND

PARAMETER	DATE ANALYZED
MOISTURE	08/15/94

Analytical Technologies, Inc.

ATI I.D. # 408126

GENERAL CHEMISTRY ANALYSIS
DATA SUMMARY

CLIENT : AGRA EARTH & ENVIRONMENTAL MATRIX : SOIL
PROJECT # : 12-01203
PROJECT NAME : CHEVRON-1323 LEE BLVD./RICHLAND UNITS : %

ATI I.D. #	CLIENT I.D.	MOISTURE
408126-1	MW-1 S-1	15
408126-2	MW-1 S-3	11
408126-3	MW-2 S-1	24
408126-5	MW-2 S-3	14
408126-6	MW-3 S-1	17
408126-7	MW-3 S-2	12

Analytical Technologies, Inc.

ATI I.D. # 408126

GENERAL CHEMISTRY ANALYSIS
QUALITY CONTROL DATA

CLIENT : AGRA EARTH & ENVIRONMENTAL MATRIX : SOIL
PROJECT # : 12-01203
PROJECT NAME : CHEVRON-1323 LEE BLVD./RICHLAND UNITS : %

PARAMETER	ATI I.D.	SAMPLE RESULT	DUP RESULT	RPD	SPIKED RESULT	SPIKE ADDED	% REC
MOISTURE	408132-4	9.5	9.4	1	N/A	N/A	N/A

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

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

Analytical Technologies, Inc. ATI Reference: 408126

Analytical Summary Report

Client: AGRA Earth and Environmental

Project: Chevron-1323 Lee Blvd./Richland (12-01203)

Analysis: WA DOE WTPH-G/8020(BETX)/MTBE **Matrix: WATER** **Units: ug/L**

ATI Sample #:	0	0	0	9		10		11	
Client ID:	Method Blank	Method Blank	Method Blank	MW-1		MW-2		MW-3	
Date Sampled:	N/A	N/A	N/A	08/11/94		08/11/94		08/11/94	
Date Extracted:	N/A	N/A	N/A	N/A		N/A		N/A	
Date Analyzed:	08/15/94	08/16/94	08/17/94	08/18/94		08/16/94		08/16/94	
Benzene	<0.5	<0.5	<0.5	7.2	D3	110	D6	22	D4
Ethylbenzene	<0.5	<0.5	<0.5	50	D3	290	D6	520	D4
Toluene	<0.5	<0.5	<0.5	6.3	D3	69	D6	90	D4
Total Xylenes	<0.5	<0.5	<0.5	250	D3	970	D6	2400	D5
MTBE	<5.0	<5.0	<5.0	<25	D3	<250	D6	<50	D4
Gasoline (Toluene to Dodecane)	<100	<100	<100	5800	D3	20000	D6	27000	D4
Surrogate Recoveries (%)									
Bromofluorobenzene	88	87	87	107	D3	105	D6	107	D4
Trifluorotoluene	95	94	96	93	D3	97	D6	102	D4

ATI Sample #:	12
Client ID:	TRIP BLANK
Date Sampled:	N/A
Date Extracted:	N/A
Date Analyzed:	08/16/94
Benzene	<0.5
Ethylbenzene	<0.5
Toluene	<0.5
Total Xylenes	<0.5
MTBE	<5.0
Gasoline (Toluene to Dodecane)	<100
Surrogate Recoveries (%)	
Bromofluorobenzene	88
Trifluorotoluene	95

Surrogate Limits: (BFB: 76-120, TFT:50-150)

D3 Value from a five fold diluted analysis.
D4 Value from a ten fold diluted analysis.
D5 Value from a twenty fold diluted analysis.
D6 Value from a 50 fold diluted analysis.

Analytical Technologies, Inc. ATI Reference: 408126

Quality Control Summary Report

Client: AGRA Earth and Environmental

Project: Chevron-1323 Lee Blvd./Richland (12-01203)

Analysis: WA DOE WTPH-G/8020(BETX)/MTBE **Matrix: WATER** **Units: ug/L** **Blank Spike/Blank Spike Duplicate**

Extracted: N/A **Analyzed: 08/15/94** **Sample ID: Blank**

Compound	Sample Result	Duplicate Result	RPD	Spike Added	Spike Result	Spike %Rec	Spike Dup. Result	Spike Dup. %Rec	RPD	Limits %Rec	Limits RPD
BENZENE	<0.500	N/A	N/A	20.0	19.4	97	N/A	N/A	N/A	89-110	10
TOLUENE	<0.500	N/A	N/A	20.0	20.1	101	N/A	N/A	N/A	89-113	10
TOTAL XYLENES	<0.500	N/A	N/A	40.0	39.4	99	N/A	N/A	N/A	89-111	10
GASOLINE	<100	N/A	N/A	1000	891	89	N/A	N/A	N/A	78-116	20

ality Control Surrogate Recoveries (%)

Compound	Sample	Spike	Spike Dup.	Limits
BROMOFLUOROBENZENE	88	93	N/A	76-120
TRIFLUOROTOLUENE	95	95	N/A	50-150

Analysis: WA DOE WTPH-G/8020(BETX)/MTBE **Matrix: WATER** **Units: ug/L** **Blank Spike/Blank Spike Duplicate**

Extracted: N/A **Analyzed: 08/16/94** **Sample ID: Blank**

Compound	Sample Result	Duplicate Result	RPD	Spike Added	Spike Result	Spike %Rec	Spike Dup. Result	Spike Dup. %Rec	RPD	Limits %Rec	Limits RPD
BENZENE	<0.500	N/A	N/A	20.0	19.4	97	N/A	N/A	N/A	89-110	10
TOLUENE	<0.500	N/A	N/A	20.0	20.2	101	N/A	N/A	N/A	89-113	10
TOTAL XYLENES	<0.500	N/A	N/A	40.0	39.6	99	N/A	N/A	N/A	89-111	10
GASOLINE	<100	N/A	N/A	1000	975	98	N/A	N/A	N/A	78-116	20

Quality Control Surrogate Recoveries (%)

.npound	Sample	Spike	Spike Dup.	Limits
BROMOFLUOROBENZENE	87	93	N/A	76-120
TRIFLUOROTOLUENE	94	98	N/A	50-150

Analytical Technologies, Inc. ATI Reference: 408126

Quality Control Summary Report

Client: AGRA Earth and Environmental

Project: Chevron-1323 Lee Blvd./Richland (12-01203)

Analysis: WA DOE WTPH-G/8020(BETX)/MTBE **Matrix: WATER** **Units: ug/L** **Blank Spike/Blank Spike Duplicate**

Extracted: N/A **Analyzed: 08/17/94** **Sample ID: Blank**

Compound	Sample Result	Duplicate Result	RPD	Spike Added	Spike Result	Spike %Rec	Spike Dup. Result	Spike Dup. %Rec	RPD	Limits %Rec	Limits RPD
BENZENE	<0.500	N/A	N/A	20.0	19.2	96	N/A	N/A	N/A	89-110	10
TOLUENE	<0.500	N/A	N/A	20.0	19.8	99	N/A	N/A	N/A	89-113	10
TOTAL XYLENES	<0.500	N/A	N/A	40.0	38.6	97	N/A	N/A	N/A	89-111	10
GASOLINE	<100	N/A	N/A	1000	985	99	N/A	N/A	N/A	78-116	20

Quality Control Surrogate Recoveries (%)

Compound	Sample	Spike	Spike Dup.	Limits
BROMOFLUOROBENZENE	87	92	N/A	76-120
TRIFLUOROTOLUENE	96	97	N/A	50-150

Analysis: WA DOE WTPH-G/8020(BETX)/MTBE **Matrix: WATER** **Units: ug/L** **Matrix Spike/Matrix Spike Duplicate**

Extracted: N/A **Analyzed: 08/16/94** **Sample ID: 408130-2**

Compound	Sample Result	Duplicate Result	RPD	Spike Added	Spike Result	Spike %Rec	Spike Dup. Result	Spike Dup. %Rec	RPD	Limits %Rec	Limits RPD
GASOLINE	<100	<100	NC	N/A	N/A	N/A	N/A	N/A	N/A	N/A	20

Quality Control Surrogate Recoveries (%)

Compound	Sample	Sample Dup.	Spike Dup.	Limits
TRIFLUOROTOLUENE	97	97	N/A	50-150

Analysis: WA DOE WTPH-G/8020(BETX)/MTBE **Matrix: WATER** **Units: ug/L** **Matrix Spike/Matrix Spike Duplicate**

Extracted: N/A **Analyzed: 08/16/94** **Sample ID: 408106-3**

Compound	Sample Result	Duplicate Result	RPD	Spike Added	Spike Result	Spike %Rec	Spike Dup. Result	Spike Dup. %Rec	RPD	Limits %Rec	Limits RPD
BENZENE	<0.500	N/A	N/A	20.0	19.3	97	19.7	99	2	86-113	10
TOLUENE	<0.500	N/A	N/A	20.0	20.3	102	20.1	101	1	87-114	10
TOTAL XYLENES	<0.500	N/A	N/A	40.0	40.3	101	40.5	101	0	85-113	10
GASOLINE	<100	<100	NC	1000	935	94	901	90	4	80-113	20

Quality Control Surrogate Recoveries (%)

Compound	Sample	Spike	Spike Dup.	Limits
BROMOFLUOROBENZENE	93	98	103	76-120
TRIFLUOROTOLUENE	94	95	98	50-150

Analytical Technologies, Inc. ATI Reference: 408126

Analytical Summary Report

Client: AGRA Earth and Environmental

Project: Chevron-1323 Lee Blvd./Richland (12-01203)

Analysis: WA DOE WTPH-G/8020(BETX)/MTBE **Matrix: SOIL** **Units: mg/Kg (Dry Weight Basis)**

ATI Sample #:	0	1	2	3	5	6
Client ID:	Method Blank	MW-1 S-1	MW-1 S-3	MW-2 S-1	MW-2 S-3	MW-3 S-1
Date Sampled:	N/A	08/10/94	08/10/94	08/11/94	08/11/94	08/10/94
Date Extracted:	08/15/94	08/15/94	08/15/94	08/15/94	08/15/94	08/15/94
Date Analyzed:	08/15/94	08/16/94	08/16/94	08/16/94	08/16/94	08/17/94
Benzene	<0.025	<0.029	<0.028	<0.033	<0.029	<0.030
Ethylbenzene	<0.025	<0.029	0.067	<0.033	0.14	<0.030
Toluene	<0.025	<0.029	<0.028	<0.033	0.070	<0.030
Total Xylenes	<0.025	<0.029	0.12	<0.033	0.37	<0.030
MTBE	<0.25	<0.29	<0.28	<0.33	<0.29	<0.30
Gasoline (Toluene to Dodecane)	<5	<6	35	<7	77	<6
Surrogate Recoveries (%)						
Bromofluorobenzene	92	76	84	78	81	75
Trifluorotoluene	100	83	87	84	84	80

ATI Sample #:	7
Client ID:	MW-3 S-2
Date Sampled:	08/10/94
Date Extracted:	08/15/94
Date Analyzed:	08/16/94
Benzene	<0.028
Ethylbenzene	<0.028
Toluene	<0.028
Total Xylenes	<0.028
MTBE	<0.28
Gasoline (Toluene to Dodecane)	<6
Surrogate Recoveries (%)	
Bromofluorobenzene	78
Trifluorotoluene	79

Surrogate Limits: (BFB:52-116 TFT:50-150)

Analytical Technologies, Inc. ATI Reference: 408126

Quality Control Summary Report

Client: AGRA Earth and Environmental

Project: Chevron-1323 Lee Blvd./Richland (12-01203)

Analysis: WA DOE WTPH-G/8020(BETX)/MTBE **Matrix: SOIL** **Units: mg/Kg** **Blank Spike/Blank Spike Duplicate**

Extracted: 08/15/94 **Analyzed: 08/15/94** **Sample ID: Blank**

Compound	Sample Result	Duplicate Result	RPD	Spike Added	Spike Result	Spike %Rec	Spike Dup. Result	Spike Dup. %Rec	RPD	Limits %Rec	Limits RPD
BENZENE	<0.0250	N/A	N/A	1.00	0.972	97	N/A	N/A	N/A	82-109	20
TOLUENE	<0.0250	N/A	N/A	1.00	0.997	100	N/A	N/A	N/A	86-116	20
TOTAL XYLENES	<0.0250	N/A	N/A	2.00	1.97	99	N/A	N/A	N/A	83-119	20
GASOLINE	<5.00	N/A	N/A	50.0	51.7	103	N/A	N/A	N/A	78-115	20

Quality Control Surrogate Recoveries (%)

Compound	Sample	Spike	Spike Dup.	Limits
BROMOFLUOROBENZENE	92	85	N/A	52-116
TRIFLUOROTOLUENE	100	98	N/A	50-150

Analysis: WA DOE WTPH-G/8020(BETX)/MTBE **Matrix: SOIL** **Units: mg/Kg** **Matrix Spike/Matrix Spike Duplicate**

Extracted: 08/15/94 **Analyzed: 08/16/94** **Sample ID: 408132-1**

Compound	Sample Result	Duplicate Result	RPD	Spike Added	Spike Result	Spike %Rec	Spike Dup. Result	Spike Dup. %Rec	RPD	Limits %Rec	Limits RPD
GASOLINE	<5.00	<5.00	NC	N/A	N/A	N/A	N/A	N/A	N/A	N/A	20

Quality Control Surrogate Recoveries (%)

Compound	Sample	Sample Dup.	Spike Dup.	Limits
TRIFLUOROTOLUENE	87	88	N/A	50-150

Analysis: WA DOE WTPH-G/8020(BETX)/MTBE **Matrix: SOIL** **Units: mg/Kg** **Matrix Spike/Matrix Spike Duplicate**

Extracted: 08/15/94 **Analyzed: 08/15/94** **Sample ID: 408132-2**

Compound	Sample Result	Duplicate Result	RPD	Spike Added	Spike Result	Spike %Rec	Spike Dup. Result	Spike Dup. %Rec	RPD	Limits %Rec	Limits RPD
BENZENE	<0.0250	N/A	N/A	1.00	0.905	91	0.911	91	1	62-104	20
TOLUENE	<0.0250	N/A	N/A	1.00	0.956	96	0.963	96	1	63-115	20
TOTAL XYLENES	<0.0250	N/A	N/A	2.00	1.92	96	1.92	96	0	64-117	20
GASOLINE	<5.00	<5.00	NC	50.0	49.0	98	47.5	95	3	59-111	20

Quality Control Surrogate Recoveries (%)

Compound	Sample	Spike	Spike Dup.	Limits
BROMOFLUOROBENZENE	80	83	82	52-116
TRIFLUOROTOLUENE	85	91	90	50-150

Analytical Technologies, Inc. ATI Reference: 408126

Analytical Summary Report

Client: AGRA Earth and Environmental

Project: Chevron-1323 Lee Blvd./Richland (12-01203)

Analysis: WA DOE WTPH-D **Matrix: WATER** **Units: mg/L**

ATI Sample #:	0	9	10	11
Client ID:	Method Blank	MW-1	MW-2	MW-3
Date Sampled:	N/A	08/11/94	08/11/94	08/11/94
Date Extracted:	08/15/94	08/15/94	08/15/94	08/15/94
Date Analyzed:	08/17/94	08/17/94	08/17/94	08/17/94
Diesel (C12-C24)	<0.25	2.4	5.8	3.0
Surrogate Recoveries (%)				
o-Terphenyl	99	96	101	96

Surrogate Limits: (O-T:50-150)

Analytical Technologies, Inc. ATI Reference: 408126

Quality Control Summary Report

Client: AGRA Earth and Environmental

Project: Chevron-1323 Lee Blvd./Richland (12-01203)

Analysis: WA DOE WTPH-D | **Matrix: WATER** | **Units: mg/L** | **Blank Spike/Blank Spike Duplicate**

Extracted: 08/15/94 **Analyzed: 08/17/94** **Sample ID: Blank**

Compound	Sample Result	Duplicate Result	RPD	Spike Added	Spike Result	Spike %Rec	Spike Dup. Result	Spike Dup. %Rec	RPD	Limits %Rec	Limits RPD
DIESEL	<0.250	N/A	N/A	2.50	2.84	114	N/A	N/A	N/A	70-114	20

Quality Control Surrogate Recoveries (%)

Compound	Sample	Spike	Spike Dup.	Limits
O-TERPHENYL	99	103	N/A	50-150

Analysis: WA DOE WTPH-D | **Matrix: WATER** | **Units: mg/L** | **Matrix Spike/Matrix Spike Duplicate**

Extracted: 08/15/94 **Analyzed: 08/17/94** **Sample ID: 408115-2**

Compound	Sample Result	Duplicate Result	RPD	Spike Added	Spike Result	Spike %Rec	Spike Dup. Result	Spike Dup. %Rec	RPD	Limits %Rec	Limits RPD
DIESEL	0.473	0.512	8	2.38	3.32	120	2.89	102	14	56-135	20

Quality Control Surrogate Recoveries (%)

Compound	Sample	Spike	Spike Dup.	Limits
O-TERPHENYL	91	105	92	50-150

Analytical Technologies, Inc. ATI Reference: 408126

Analytical Summary Report

Client: AGRA Earth and Environmental

Project: Chevron-1323 Lee Blvd./Richland (12-01203)

Analysis: WA DOE WTPH-D **Matrix: SOIL** **Units: mg/Kg (Dry Weight Basis)**

ATI Sample #:	0	1	2	3	5	6
Client ID:	Method Blank	MW-1 S-1	MW-1 S-3	MW-2 S-1	MW-2 S-3	MW-3 S-1
Date Sampled:	N/A	08/10/94	08/10/94	08/11/94	08/11/94	08/10/94
Date Extracted:	08/15/94	08/15/94	08/15/94	08/15/94	08/15/94	08/15/94
Date Analyzed:	08/15/94	08/16/94	08/16/94	08/16/94	08/16/94	08/16/94
Diesel (C12-C24)	<10	<12	<11	<13	13	54
Surrogate Recoveries (%)						
O-Terphenyl	93	100	103	94	96	93

ATI Sample #:	7
Client ID:	MW-3 S-2
Date Sampled:	08/10/94
Date Extracted:	08/15/94
Date Analyzed:	08/16/94
Diesel (C12-C24)	<11
Surrogate Recoveries (%)	
O-Terphenyl	96

Surrogate Limits: (O-T:50-150)

Analytical Technologies, Inc. ATI Reference: 408126

Quality Control Summary Report

Client: AGRA Earth and Environmental

Project: Chevron-1323 Lee Blvd./Richland (12-01203)

Analysis: WA DOE WTPH-D | **Matrix: SOIL** | **Units: mg/Kg** | **Blank Spike/Blank Spike Duplicate**

Extracted: 08/15/94 **Analyzed: 08/15/94** **Sample ID: Blank**

Compound	Sample Result	Duplicate Result	RPD	Spike Added	Spike Result	Spike %Rec	Spike Dup. Result	Spike Dup. %Rec	RPD	Limits %Rec	Limits RPD
DIESEL	<10.0	N/A	N/A	200	213	107	N/A	N/A	N/A	69-115	20

Quality Control Surrogate Recoveries (%)

Compound	Sample	Spike	Spike Dup.	Limits
O-TERPHENYL	93	100	N/A	50-150

Analysis: WA DOE WTPH-D | **Matrix: SOIL** | **Units: mg/Kg** | **Matrix Spike/Matrix Spike Duplicate**

Extracted: 08/15/94 **Analyzed: 08/15/94** **Sample ID: 408126-2**

Compound	Sample Result	Duplicate Result	RPD	Spike Added	Spike Result	Spike %Rec	Spike Dup. Result	Spike Dup. %Rec	RPD	Limits %Rec	Limits RPD
DIESEL	<10.0	126	F	N/A	N/A	N/A	N/A	N/A	N/A	N/A	20

Quality Control Surrogate Recoveries (%)

Compound	Sample	Sample Dup.	Spike Dup.	Limits
O-TERPHENYL	103	94	N/A	50-150

Analysis: WA DOE WTPH-D | **Matrix: SOIL** | **Units: mg/Kg** | **Matrix Spike/Matrix Spike Duplicate**

Extracted: 08/15/94 **Analyzed: 08/15/94** **Sample ID: 408127-4**

Compound	Sample Result	Duplicate Result	RPD	Spike Added	Spike Result	Spike %Rec	Spike Dup. Result	Spike Dup. %Rec	RPD	Limits %Rec	Limits RPD
DIESEL	<10.0	<10.0	NC	200	212	106	197	99	7	61-120	20

Quality Control Surrogate Recoveries (%)

Compound	Sample	Spike	Spike Dup.	Limits
O-TERPHENYL	93	93	88	50-150

F Out of limits due to matrix interference.

RZA AGRA, Inc.
Engineering & Environmental Services
539 W. Sharp, Suite D
Spokane, WA 99201
(509) 325-0104 FAX: (509) 325-0212

Chain of Custody Record / Analysis Request

№ 00378

408126

Project Name: RICHLAND CHEV Job No.: 12-01203
Project Manager: Gene St Goddard Phone #: 509 325 0104
Sampler:

RZA-AGRA Sample ID	Lab Samp ID	Date Collected	Time Collected	Matrix (S=soil, W=water, A=air)	# Containers/Preservation: 40 ml VOA /	1L Glass /	8 oz Glass /				CHILL	Analysis Requested: WTPH-G/BTEX	WTPH-D	MTBE *	Hold for Further Analysis	RUSH (see below)
MW-1 S-1	1	8/10/94	1500	S								X	X	X		
~~MW-1 S-2~~	2	↓	15:30												X	
MW-1 S-3	3 2	↓	16:00									X	X	X		
MW-2 S-1	4 3	8/11/94	9:15									X	X	X		
MW-2 S-2	5 4	↓	9:45									~~X~~	~~X~~		X	
MW-2 S-3	6 5	↓	10:30									X	X	X	~~X~~	
MW-3 S-1	7 6	8/10/94	9:00									X	X	X		
MW-3 S-2	8 7	↓	9:30									X	X	X		
MW-3 S-3	9 8	↓	10:30												X	
MW-1	10 9	8/11/94	11:15	W								X	X	X		
MW-2	11 10	↓	BOO									X	X	X		
MW-3	12 11	↓	11:00									X	X	X		

did not receive mp 8/12/94

RELINQUISHED BY SAMPLER:	RELINQUISHED BY:	RELINQUISHED BY:
Signature: Gene St Goddard	Signature:	Signature:
Printed Name: E. St. Goddard	Printed Name:	Printed Name:
Firm: AGRA	Firm:	Firm:
Date/Time: 8/11/94	Date/Time:	Date/Time:
RECEIVED BY:	RECEIVED BY:	RECEIVED BY:
Signature:	Signature:	Signature:
Printed Name: MIKE GALLAGHER	Printed Name: M. POSTMA	Printed Name:
Firm: EKDAT	Firm: ATI	Firm:
Date/Time: 8/11/94 1700	Date/Time: 8/12/94 1030	Date/Time:

LABORATORY:
Total # Containers:
Condition of Containers?
Condition of Seals?

Special Handling
Turnaround:
- ☐ 8 hours
- ☐ 24 hours
- ☐ 5 business days
- ☒ ~~10 business days~~
- ☐ other _____ (#) business days

PURPOSE OF SAMPLING / COMMENTS:
Bill Directly To Chevron
Rene White - Chev P.M.
Release # 1758830
*Screen for MTBE first, if evidence it is there run analysis

Form 100B

DISTRIBUTION: WHITE - return to originator; YELLOW - lab; PINK - retained by originator; GOLDENROD - to lab in advance

APPENDIX C
CHEVRON CHROMATOGRAM INTERPRETATION - MW-2

APPENDIX C
CHEVRON CHROMATOGRAM INTERPRETATION - MW-2

CHEVRON RESEARCH AND TECHNOLOGY COMPANY
ANALYTICAL SCIENCES UNIT

PROJECT SUMMARY

Project No.	5898		
Date Initiated	9/27/94	Requested by	R. E. White
Date Completed	10/7/94	Location	CUSA Products Co.
CRTC Charge Code	TT16660		P. O. Box 5004
			San Ramon, CA 94583
		Phone	CTN-842-9581

Project Description: Determine whether sample MW-2 is gasoline or diesel or a combination of both. The sample is from former Chevron service station, 9-8944, 1323 Lee Blvd., Richland, WA.

Results: Sample MW-2 contains 7.6 mg/L of gasoline (C_5 to C_{14}) The hydrocarbons present in the range (C_8 to C_{14}) where gasoline and diesel overlap are principally aromatics (xylenes, ethylbenzene, naphthalene, methylnaphthalene) in a typical gasoline pattern. No isoprenoid hydrocarbons, which would indicate diesel (even in the absence of normal paraffins), are present. Thus, the sample does not contain any diesel fuel.

Analytical Approach: The sample was extracted with CS_2 and analyzed by gas chromatography using a flame ionization detector to determine the hydrocarbon composition.

Analyzed by: N. Berkowitz
Reported by: J. Kimberlin JK
Reviewed by: E. A. Harvey EAH

REWhite - 1
DCYoung - 1
AWVerstuyft - 1
EAHarvey - 1
NBerkowitz - 1
JKimberlin - 1
ACFTfile
Tech. Files 300.6110

Request for E ironmental Analysis and Chain of Custody

To: Environmental Analysis Lab, Room 50-1128,
Chevron Research & Technology Co.,
100 Chevron Way, Richmond, CA 94802
Contact: Liz Harvey 510-242-4993 or Jerry Kimberlin 510-242-2161

Date: 9/19/94

Requestor (Chevron): Rene E. White
Phone: (510) 842-9581

Company, Department, Strategic Business Unit: Chevron USA Products Company
Charge Code:

Address: 6001 Bollinger Canyon Road

Sampler: AGRA E+E (Gene St. Goddard)
Phone: 509-325-0104

Company, Address: W. 539 Sharp, Ste D Spokane WA 99201

Sampling Location (Address): Site 9-8944 (MW-2) 1323 Lee Blvd., Richland, WA

☒ Service Station ☐ Fuel Terminal ☐ Marine Terminal ☐ Pipeline ☐ Refinery ☐ Other

☐ Chevron ☐ Gulf ☐ BP ☐ Cumberland Farms ☐ Other FORMER STATION

Type of Analysis Desired

☐ Identify Product ☐ Compare Spill with Potential Sources (Send Source Samples)

☐ Compare Samples with Previous Analyses. Log Numbers and/or Dates: _____

☒ Other See below (Call 510-242-4993 for Approval)

Reason for Request (Clearly State Problem, Site History, Draw or Enclose a Map, Indicate Whether Leak or Spill)

(1 week turnaround) Please answer the following question: Is this a weathered gasoline or diesel (or a combination of both)? The sample is dissolved hydrocarbon/water. I have discussed them @ length w/ Liz Harvey.

R.E. White

Normal turn-around time is 4 weeks. Call 510-242-4993 to negotiate alternate arrangements.

Sample Number	Number of Containers Per Sample	Sample Name/Description	Date Sampled	Sampled By
MW-2	2 (1 Liters)	MW-2, from upgradient monitoring well. Hydrocarbon odor, silty	9/23/94	E. Polzin AGRA E+E

Give my St Godard - AGRA P.M.

Transporter	Date Received	Initials
UPS		
Laboratory: Chevron Research & Technology	Date Received	Initials

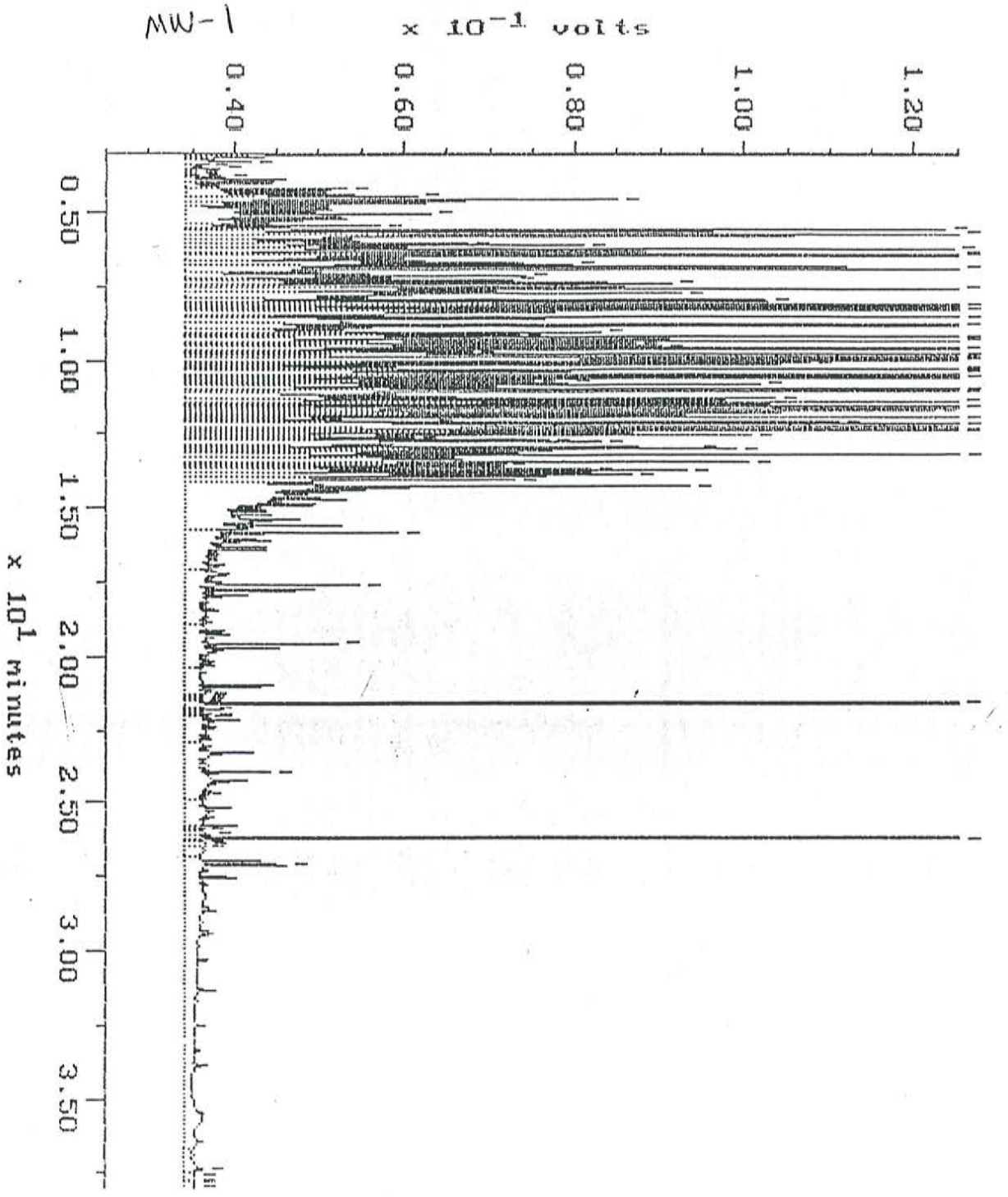
It is the shipper's responsibility to ensure Federal DOT regulations and UN performance standards are complied with. Consultation with a Chevron Regional Transport Specialist is Mandatory prior to air shipment. Contact your Chevron Representative or call the Hazmat Help Line (415-894-3481) for assistance. When in doubt, assume the sample is flammable

9/26/94

WA DOE WTPH-D

Sample: 408126-9
Acquired: 17-AUG-94 11:35
Channel: WILMA
Method: F:\BRO2\MAXDATA\WILMA\FUEL0816
Filename: R8168W22
Operator: BRO

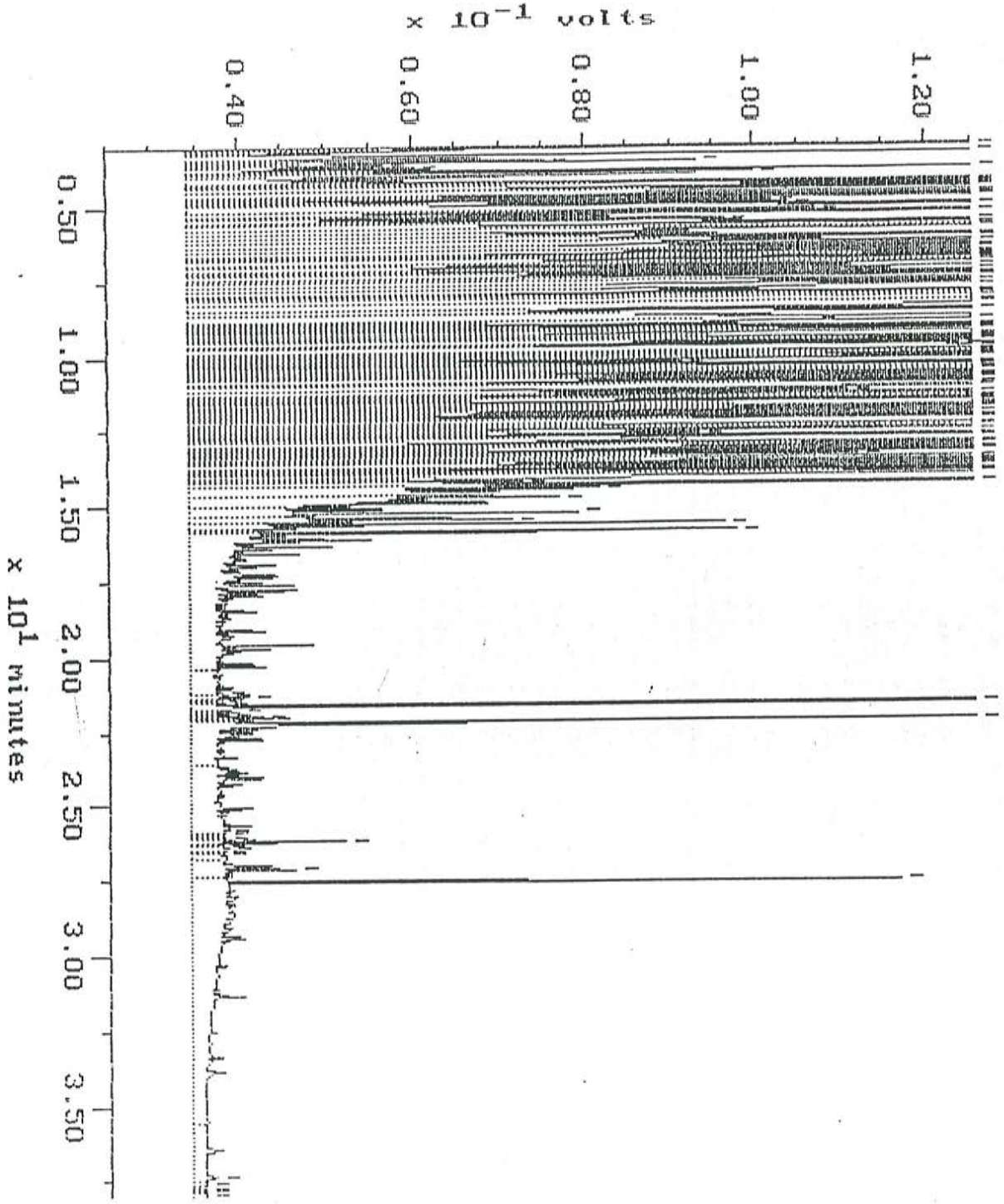
MW-1



MW-2

..A DOE-WTPH-D

Sample: 408126-10
Acquired: 17-AUG-94 12:22
Channel: WILMA
Method: F:\BRO2\MAXDATA\WILMA\FUEL0816
Filename: B8168W23
Operator: BRO



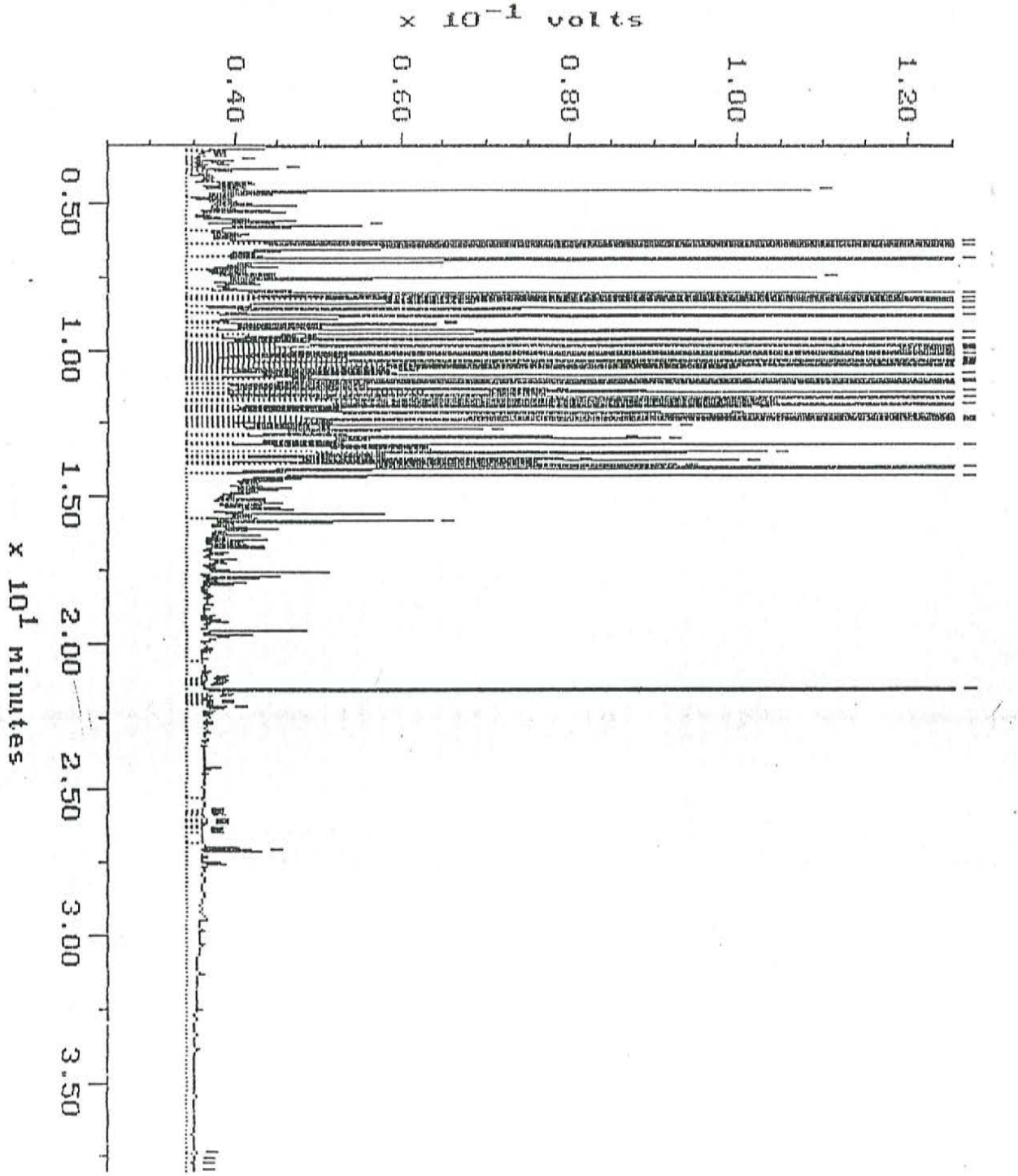
MW-3

WA DOE WTPH-D

Sample: 408126-11
Acquired: 17-AUG-94 13:08

Channel: WILMA
Method: F:\BRO2\MAXDATA\WILMA\FUEL0816

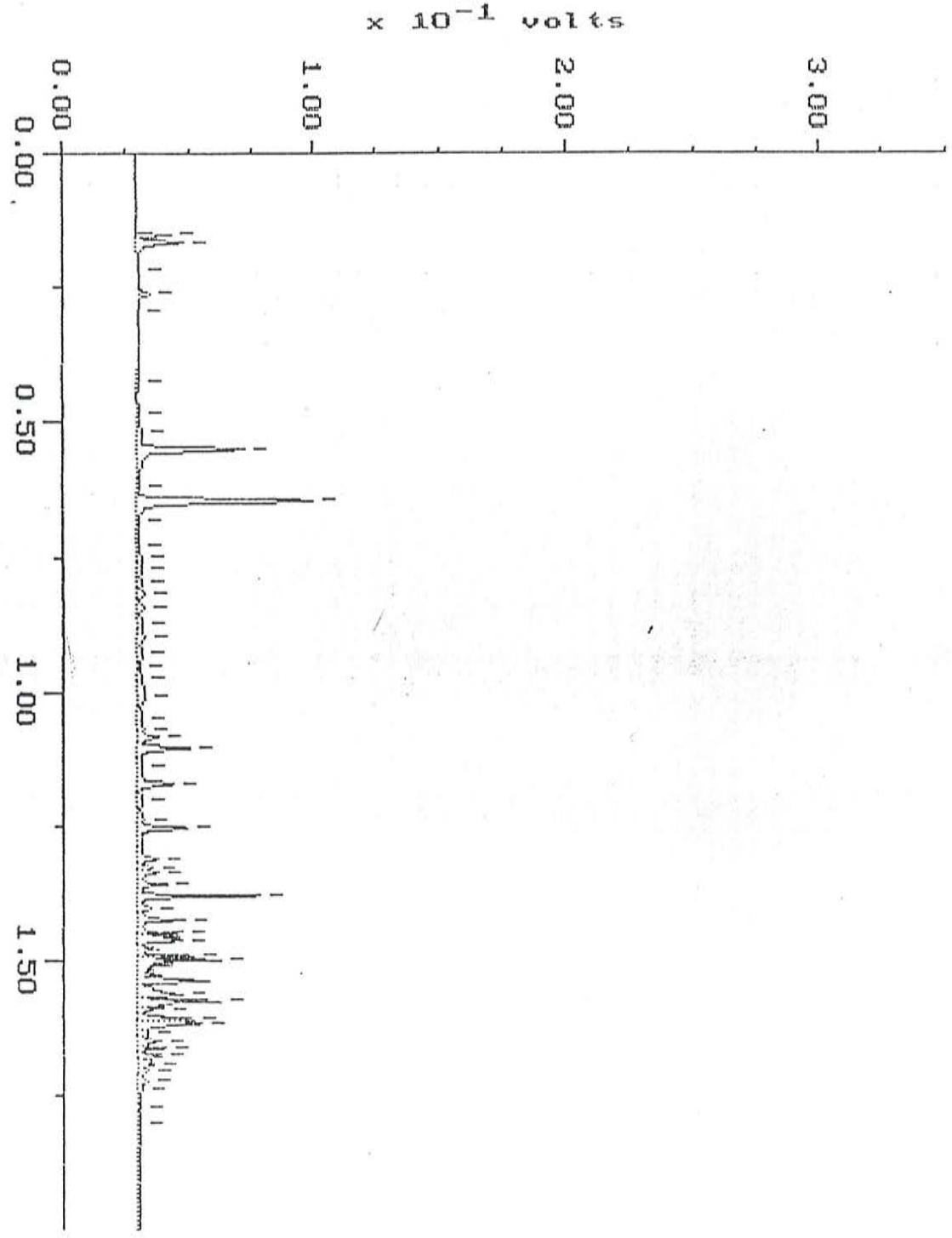
Filename: R8168W24
Operator: BRO



MW-1

WA DOE WTPH-G

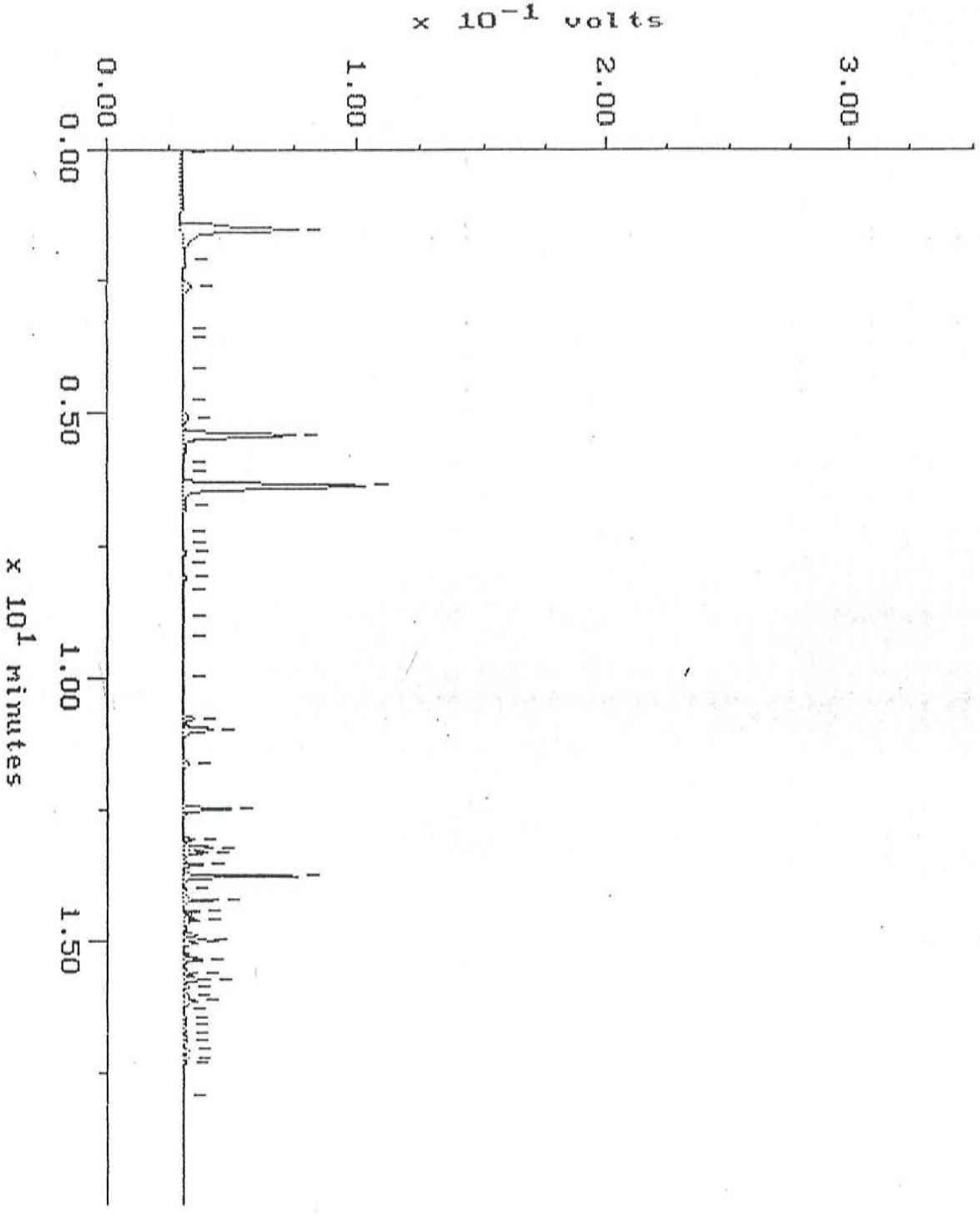
Sample: 408126-9 DIL Channel: FID Filename: R8179G29
Acquired: 18-AUG-94 2:50 Method: F:\BRO2\MAXDATA\GLAD\081794GS Operator: ATI
Dilution: 1 : 5.000
Comments: ATI : A COMMITMENT TO QUALITY



MW-2

WA DOE WTPH-G

Sample: 408126-10 DIL Channel: FID Filename: R8169G19
Acquired: 16-AUG-94 19:56 Method: F:\BRO2\MAXDATA\GLAD\081694GS Operator: ATI
Dilution: 1 : 50.000
Comments: ATI : A COMMITMENT TO QUALITY



MW-3

WA DOE WTPH-G

Sample: 408126-11 DIL
Acquired: 16-AUG-94 20:26
Dilution: 1 : 10.000
Comments: ATI : A COMMITMENT TO QUALITY

Channel: FID
Method: F:\BRO2\MAXDATA\GLAD\081694GS

Filename: R8169G20
Operator: ATI