IRAP

BROWN BEAR CAR WASH-INTERBAY KING

T-1540-03

DEPARTMENT OF ECOLOGY
NWRO/TCP TANKS UNIT

INTERIM CLEANUP REPORT	☐
SITE CHARACTERIZATION	☐
FINAL CLEANUP REPORT	☐
OTHER _____	☐
AFFECTED MEDIA: SOIL	☐
OTHER _____ GW	☐
INSPECTOR (INIT.) JB DATE 2-10-95	

IRAP Application
Brown Bear Car Wash--Interbay
Seattle, Washington

November 1994

Washington State Department of Ecology
Northwest Regional Office
3190 160th Avenue S.E.
Bellevue, Washington 98008-5452

SHANNON & WILSON, INC.
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS
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SHANNON & WILSON, INC.
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

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1954-1994 40

November 23, 1994

Washington State Department of Ecology
Northwest Regional Office
3190 160th Avenue S.E.
Bellevue, Washington 98008-5452

Attn: Ms. Elaine Atkinson

RE: IRAP APPLICATION--BROWN BEAR CAR WASH--INTERBAY

Shannon & Wilson is pleased to submit this application for review of independent cleanup action under the Washington Department of Ecology's (Ecology) Independent Remedial Action Program (IRAP). This request for review is being submitted on behalf of the site owner, Car Wash Enterprises, Inc. Also included in this package you will find the Request for Review form with a check for the $1,000 filing fee, and the Independent Remedial Action Report Summary forms, as required.

The project site is located in Seattle, south of the Ballard Bridge, in an area known as Interbay, as shown on Figure 1. The site address is 3435 15th Avenue West, Seattle, Washington 98119. The current owner is Car Wash Enterprises, Inc.

A gas station/garage was previously operated at the site by former owners. Car Wash Enterprises operates a self-serve car wash in the central portion of the site. The area where the gas station and underground tanks existed is currently a gravel covered area, which is not utilized. The land use in the area is primarily commercial, with existing businesses surrounding the car wash.

This letter presents an overview of the available site data and provides you with a reference guide to the existing site documents, which are summarized in Table 1 and included as Appendices B, C, D, and E. The documents have been cross-referenced to specific site activities presented in Table 2.

EXECUTIVE SUMMARY

An unknown number of underground storage tanks (USTs) were removed from the site in 1986. The removal of three additional USTs and the excavation of approximately 1,300

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cubic yards of petroleum-contaminated soil were performed in July and August of 1990. At the excavation limits, wall and floor samples indicated non-detectable levels of petroleum hydrocarbons as oil (WTPH-418.1) and gasoline (8015 mod.). The excavated soils were treated on site by aeration and bioremediation. Sampling of the treated soil in August 1994 indicated low levels of gasoline, at concentrations less than MTCA Method A cleanup levels.

Because of issues involving payment by the former owner to the current owner for site contamination (the tanks were installed and operated by the former owner), two monitoring wells were installed in March 1994 to check for groundwater contamination. No petroleum hydrocarbons were detected in groundwater samples collected at that time. However, oil-range (970 ppm by 418.1) and very weathered gasoline (82 ppm as gasoline, minimal BTEX) petroleum hydrocarbons were detected in subsurface soil samples from monitoring well number 2 (MW-2). The site analytical results are summarized in the attached Table 3.

In August 1994, additional exploratory excavation was performed to remove the petroleum contamination noted in the boring (MW-2). However, extensive areas of contamination could not be found during the excavation activities. Small "pockets" of potential petroleum contamination were noted, and several of these areas were sampled (Figure 2). Laboratory analysis indicated low levels of weathered gasoline in the samples (390 ppm and 40 ppm as gasoline, minimal BTEX).

A determination of MTCA Method B cleanup levels using Ecology's Petroleum-Contaminated Soils Rating Matrix was performed. The matrix and supporting documentation are contained in Appendix A. Using the matrix, cleanup levels for gasoline and oil of 600 ppm and 800 ppm were determined. Method B cleanup levels for benzene, toluene, ethylbenzene, and xylenes were also determined; however, these compounds have not been found at concentrations exceeding MTCA Method A cleanup levels and are therefore omitted from this discussion.

The maximum detected concentrations of gasoline-range and oil-range petroleum hydrocarbons remaining on site are 390 ppm and 970 ppm, respectively. The gasoline-range petroleum hydrocarbons are below the Method B cleanup level, and the oil-range concentrations are slightly above. Based on the results of the cleanup work and the additional exploratory excavation work, it does not seem practical to excavate the remaining areas of petroleum contaminated soil. Additional excavation will be difficult due to the proximity of 15th Avenue West, and in situ methods to remediate oil are not easily applied.

Neither excavation nor in situ remediation are cost-effective options, given the limited extent of the remaining contamination.

CLOSURE

Additional information regarding site activities may be found in the documents referenced in Tables 1 and 2. Copies of the documents listed in Table 1 are included with this Request for Review as Appendices B, C, D, and E. Please call me direct at (206) 633-6889 if you have any questions regarding the site.

Sincerely,

SHANNON & WILSON, INC.

Brian L. Clark
Environmental Engineer

BLC/blc

Enclosures:
Table 1 - Document Summary
Table 2 - Site Activity Summary
Table 3 - Summary of Analytical Results for Soil Samples (mg/kg)
Figure 1 - Vicinity Map
Figure 2 - Site and Exploration Plan
Appendix A - Model Toxics Control Act Method B Cleanup Level Determination
Appendix B - Final Report: Site Remediation and UST Closure, Geotech Consultants, 12/1990
Appendix C - Limited Subsurface Site Exploration at Brown Bear Car Wash--Interbay, Shannon & Wilson, Inc., T-1540-01, 6/94
Appendix D - Analytical Results From Excavation at Brown Bear Car Wash--Interbay, Shannon & Wilson, Inc., T-1540-02, 9/94
Appendix E - Analytical Results From Bioremediation Land Treatment Cell at Brown Bear Car Wash--Interbay, Shannon & Wilson, Inc., T-1540-02, 9/94
Request for Review form
Filing Fee Check for $1,000
Independent Remedial Action Report Summary forms

Items in italics are included in this package but are not part of the bound document.

cc: Jim Hansen, Car Wash Enterprises

T1540-03.LT5/T1540-lkd/eet

TABLE 1 SHANNON & WILSON, INC.

DOCUMENT SUMMARY

Date	Document Reference	Activities Reported
12/3/1990	Final Report: Site Remediation and UST Closure, Geotech Consultants	1, 2, 3, 4
6/3/1994	Limited Subsurface Site Exploration at Brown Bear Car Wash--Interbay, Shannon & Wilson, Inc., T-1540-01	5
9/28/1994	Analytical Results From Excavation At Brown Bear Car Wash--Interbay, Shannon & Wilson, Inc., T-1540-02	6, 8
9/28/1994	Analytical Results From Bioremediation Land Treatment Cell At Brown Bear Car Wash--Interbay, Shannon & Wilson, Inc., T-1540-02	7

TABLE 2

SITE ACTIVITY SUMMARY

Activity Number	Dates	Activity
1	1986	Removal of unknown number of USTs
2	7/10-11/1990	Soil excavation in area of previous USTs
3	8/6-10/1990	Borings B-1 through B-6 drilled at site to delineate extent of contamination
4	8/10-12/90	Additional soil excavation. Removal of 3 previously unknown USTs.
5	5/2/94	Installation of monitoring wells (MW) 1 and 2
6	8/29/94	Exploratory excavation around MW-2
7	8/29/94	Closure sampling of bioremediation landfarm/disposal characerization and discussion
8	8/31/94	Additional exploratory excavation around MW-2

TABLE 3

SUMMARY OF ANALYTICAL RESULTS FOR SOIL SAMPLES (mg/kg)

Sample Number	Location	Date	WTHP-418.1	WTPH-G	Benzene	Toluene	Ethylbenzene	Total Xylenes
Floor	floor	9/90	< 25	< 1	NA			
Ewall-1	east wall	9/90	< 25	< 1	NA			
Ewall-2	east wall	9/90	< 25	< 1	NA			
Wwall-1	west wall	9/90	44	< 1	NA			
Wwall-2	west wall	9/90	40	< 1	NA			
Nwall-1	north wall	9/90	40	< 1	NA			
Nwall-2	north wall	9/90	55	< 1	NA			
1540B1S2	B-1, 7.5'	5/2/94	None Detected by HCID					
1540B1S3	B-1, 12.5'	5/2/94	None Detected by HCID					
1540B1S8	B-1, 37.5'	5/2/94	None Detected by HCID					
1540B2S3	B-2, 12.5'	5/2/94	970	82	< 0.001	0.13	0.47	1.53
1540B2S5	B-2, 22.5'	5/2/94	None Detected by HCID					
1540B2S7	B-2, 32.5	5/2/94	None Detected by HCID					
1540-12-10	12' BG	8/29/94	None Detected by HCID					
1540-06-11	6' BG	8/24/94	NA	< 1.0	< 0.02	< 0.02	< 0.02	< 0.06
1540-12-19	12' BG	8/31/94	NA	ND	ND	ND	ND	ND
1540-14-20	14' BG	8/31/94	NA	390	< 0.02	0.13	1.6	2.3
1540-09-21	9' BG	8/31/94	NA	40	< 0.02	< 0.02	0.06	0.13
MTCA Method A Cleanup Levels			200	100	0.5	40	20	20
MTCA Method B Cleanup Levels			800	600	2	130	250	250

ND = Not Detected
NA = Not Analyzed
11-21-94/T1540-03.TBS-lkd/eet

NOTE

Map adapted from USGS topographic map of Seattle North, WA quadrangle, dated 1983.

Car Wash Enterprises - Interbay
Seattle, Washington

VICINITY MAP

November 1994 T-1540-03

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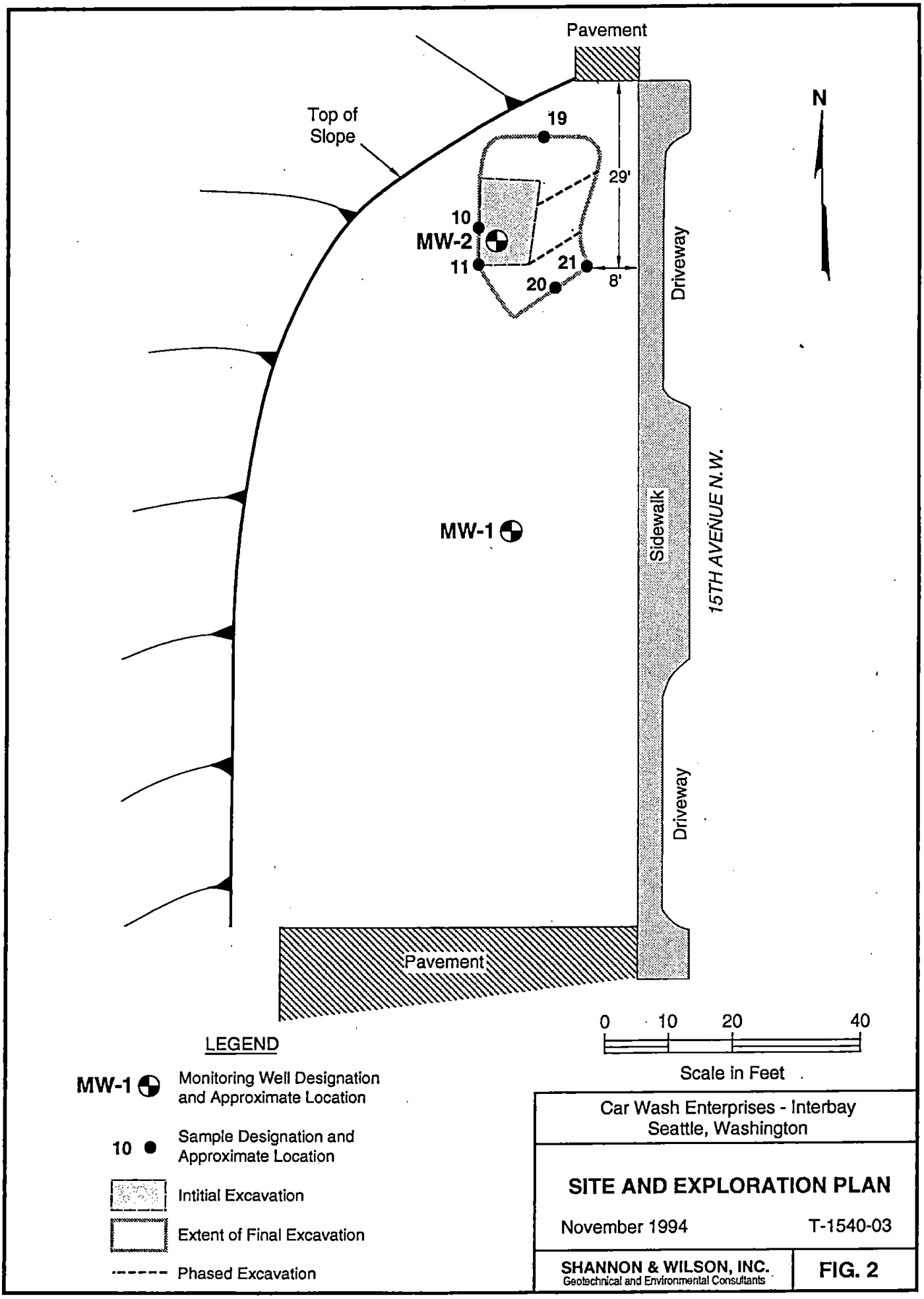
FIG. 1



Car Wash Enterprises - Interbay
Seattle, Washington

SITE AND EXPLORATION PLAN

November 1994 T-1540-03

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FIG. 2

APPENDIX A

MODEL TOXICS CONTROL ACT METHOD B CLEANUP LEVEL DETERMINATION

APPENDIX A

MODEL TOXICS CONTROL ACT METHOD B CLEANUP LEVEL DETERMINATION

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TABLE

Table No.	
A-1	Department of Ecology - Petroleum Contaminated Soils Rating Matrix

FIGURE

Figure No.	
A-1	Half Mile Radius Well Search

APPENDIX A

MODEL TOXICS CONTROL ACT METHOD B CLEANUP LEVEL DETERMINATION

A.1 PETROLEUM-CONTAMINATED SOILS RATING MATRIX

Ecology's Petroleum Contaminated Soils Rating Matrix was used to determine a Method B cleanup level for this site. The rating matrix, with a discussion of the determination of values in each category, is presented as Table A-1.

A.2 VERTICAL SEPARATION BETWEEN LOWEST ELEVATION OF CONTAMINANTS AND GROUND WATER TABLE

In May, 1994, groundwater was recorded at a depth of approximately 33-34 feet below grade. No petroleum hydrocarbons were present in groundwater samples collected from two wells at the site (Sample Numbers 154030 and 154031, Appendix A of S&W's June 1994 report [see Appendix C]).

Soil boring B-1 indicates potential petroleum hydrocarbons at a depth of 20 feet below grade (see Plate 3, Appendix B), although this was not verified by laboratory testing. A soil sample collected from the floor of the cleanup excavation detected <25 ppm oil and <1 ppm gasoline (Sample Number "Floor," Appendix B, Table 1). Soil boring MW-2 contained petroleum hydrocarbons at 12.5 feet below grade, as verified by laboratory testing (Sample Number 1540B2S3, Appendix C, Table 1). Petroleum hydrocarbons were also detected at approximately 14 feet below grade in exploratory excavations (Sample Number 1540-14-20, Appendix D, Table 1).

Based on the above information, the vertical separation between confirmed petroleum hydrocarbons and the groundwater table is greater than 20 feet. Note that no attempt has been made to separate individual BTEX components in this analysis.

A.3 MEAN ANNUAL PRECIPITATION

The mean annual precipitation value of 31.92 inches from Table 7 of the Soils Rating Matrix Guidance was used.

A.4 SOIL TYPE

The soil type at the site is variable, consisting of fill and native soils. In general, the soil is silty sand, with a layer of silt and/or clay at approximately 25 feet below grade (see boring logs and Plates 3 to 9, Appendix B; and Figures 3 and 4, Appendix C). For the purpose of the soils rating matrix, the designation coarse-grained soils with fines was selected.

A.5 RECEPTOR DISTANCE

Shannon & Wilson conducted a well search at Ecology's Northwest Region Office on 11/9/94. No drinking water wells were found to be located within a 1/2 mile radius of the site. Salmon Bay Fisherman's Terminal in Ballard is the nearest surface water body, at a distance of over 1/4 mile. The nearest receptor was therefore taken as greater than 1/4 mile, but less than 1/2 mile.

A.6 CONTAMINATED SOIL AREA

Based on the latest exploratory excavation activities at the site, it is believed that remaining contamination is limited in extent, and exists in an area less than 600 square feet.

TABLE A–1

DEPARTMENT OF ECOLOGY - PETROLEUM CONTAMINATED SOILS RATING MATRIX

INSTRUCTIONS FOR COMPLETING THE MATRIX SCORE SHEET

1. Select the most applicable condition and corresponding point values from each site category.
2. Sum each column. Index individual points sums to Table 4 to obtain benzene, toluene, ethyl benzene and xylene cleanup values.
3. Index the line 6 average to Table 5 to obtain Gasoline & Diesel Total Petroleum Hydrocarbon (TPH) cleanup values.

SITE CATEGORY	POINT VALUES			
1. Vertical Separation Between the Lowest Contaminant Elevation and First Aquifer.	B	T	E	X
a. greater than or = 10 but less than 20 ft.	10	10	10	10
b. greater than or = 20 but less than 35 ft.	(6)	(6)	(6)	(6)
c. greater than or = 35 but less than 50 ft.	4	4	4	4
d. greater than or = 50 ft.	2	2	2	2
2. Mean Annual Precipitation				
a. greater than or = 36 but less than 54 inches	10	10	14	10
b. greater than or = 13 but less than 36 inches	(5)	(5)	(7)	(5)
c. less than or = 13 inches	1	1	1	1
3. Soil Type				
a. Clean coarse-grained soils (USCS GW, GP, GM, GC or mixtures)	8	10	8	8
b. Coarse-grained soils with fines (USCS SW, SP, SM or mixtures)	(6)	(6)	(8)	(6)
c. Fine-grained soils (USCS ML,CL,OL,MH,CH,OH)	4	4	6	4
4. Receptor Distance				
a. less than 1/8 mile (660 ft.)	5	14	16	14
b. greater than or = 1/8 but less than 1/4 mi (660-1320 ft.)	3	7	8	7
c. greater than or = 1/4 but less than 1/2 mi (1320-2640 ft.)	(1)	(1)	(1)	(1)
d. greater than or = 1/2 mi (2640 ft.)	0	0	0	0
5. Contaminated Soil Area				
a. greater than or = 5,000 sq.ft.	14	14	14	14
b. greater than or = 1,200 but less than 5,000 sq.ft.	8	8	8	8
c. greater than or = 600 but less than 1,200 sq.ft.	6	6	6	6
d. less than or = 600 sq.ft.	(2)	(2)	(2)	(2)
6. Sum From Each Column =	20	20	24	20

USE THE LINE 6 & 7 VALUES TO OBTAIN BTEX AND TPH CLEANUP VALUES (SEE TABLES 4 & 5)

7. Average of Line 6 (ROUNDED TO THE NEAREST WHOLE NUMBER) =	21

LEGEND

⊕ Project Location

NOTE

Map adapted from USGS topographic map of Seattle North, WA quadrangle, dated 1983.

Car Wash Enterprises - Interbay
Seattle, Washington

HALF MILE RADIUS WELL SEARCH

November 1994 T-1540-03

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

FIG. A-1

APPENDIX B

FINAL REPORT: SITE REMEDIATION AND UST CLOSURE
GEOTECH CONSULTANTS
DECEMBER 3, 1990

GEOTECH CONSULTANTS
13256 N.E. 20th St. (Northup Way), Suite 16
Bellevue, WA 98005
(206) 747-5618
(206) 343-7959

TO: Car Wash Enterprises, Inc.
P.O. Box 70527
Seattle, Washington 98107-0527

DATE: 4 December 1990

JOB NO.: JN 0186

PROJECT: 3435 - 15th Ave. W. Facility
Seattle, Washington

ATTENTION: Mr. Vic Odermat

WE ARE SENDING YOU:

☒ Attached
☒ Via FAX To 789-9274 Transmitting 28 Pages Including This Page

☐ Field Reports ☐ Preliminary Drafts ☒ Report
☐ Reports ☐ Test Results

Copies	Date	Description
2	12/3/90	Final Report: Site Remediation & UST Closure
1 ea	Daily Field Reports	7/10,11,27/90 : 8/6,10/90 : 9/10,11,12/90 (8 pages)

THESE ARE TRANSMITTED FOR YOUR:

☒ Information ☐ Signature
☐ Files ☐ Distribution
☐ Approval ☐ _____
☐ Review and Comments ☐ _____

REMARKS: _____

CC: _____

Signed: SPO:mk

GEOTECH CONSULTANTS
13256 N.E. 20th St. (Northup Way), Suite 16
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GEOTECH
CONSULTANTS

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(206) 747-5618
(206) 343-7959

December 3, 1990

JN 0186

Car Wash Enterprises
P.O. Box 70527
Seattle, Washington 98107-0527

Attention: Mr. Victor Odermat

Subject: FINAL REPORT: SITE REMEDIATION AND UST CLOSURE
Brown Bear Car Wash
3435 15th Avenue West
Seattle, Washington.

Dear Mr. Odermat:

The Environmental Services Division of Geotech Consultants, Inc. has completed field observation, documentation, and laboratory analysis associated with site remediation and formal closure of underground storage tanks (USTs) on the subject site. This activity was initiated to satisfy regulatory requirements imposed under 40 CFR, Part 280.72, pertaining to site assessment at the time of closure.

PROJECT DESCRIPTION

Surface Conditions

At the time of our work for this project, the site was void of permanent structures. The property is located on the west side of the 3400 block of 15th Avenue West in Seattle, Washington, as illustrated in the Vicinity Map, Plate 1 appended to this report. Immediately to the south of the subject property is an operating Brown Bear Car Wash facility. The western boundary of the property is marked by a steep slope which drops 20 to 25 feet.

Project Background

The following serves as a chronology of the events leading up to the final removal of contaminated soil on the site:

- According to Mr. Arnold Jackson of Car Wash Enterprises, the property is the site of a former gasoline service station. Mr. Jackson informed us that underground storage tanks (UST) were removed from the site in approximately 1986. We were also informed that at the time of removal, residual hydrocarbon odors were noted in the tankhold excavation.

- In July 1990, Geotech Consultants, Inc. was retained to manage/document excavation and removal of contaminated soil associated with the prior removal of USTs. On July 10 and 11, 1990, excavation began on the property in an attempt to remove any contaminated soil. A track-mounted backhoe capable of reaching a depth of approximately 20 feet was employed for the excavation work. During excavation activities, field screening techniques indicated that petroleum contamination reached a depth greater than 20 feet. Rather than continue with larger equipment, the decision was made to drill a series of borings in an effort to thoroughly assess the areal and vertical extent of the contamination.

METHODOLOGY/SCOPE OF WORK

General

The scope of work for this project involved two phases of activity on the subject site:

* PHASE 1 - Drilling Exploration and Soil Sampling

On August 6 and 10, 1990, an environmental engineer from our firm drilled a series of borings on the subject property in an effort to identify the areal and vertical extent of contaminated soils. The locations of the borings are noted in the Site Exploration Plan, Plate 2.

Equipment employed for the actual drilling consisted of a mobile truck-mounted drilling unit equipped with four-inch inner-diameter hollow stem augers. Under the supervision of our staff, the drilling unit was brought into position over the selected boring locations, blocked up and leveled before drilling. Following set-up preparations, the auger was advanced to successively increasing depths until the samples collected at intervals through the auger string revealed no odors or other characteristics associated with soil contamination.

Soil Sampling

The soil sampling technique consisted of advancing the hole with the auger string to the desired depth, then lowering the sampler and connecting rods through the center of the hollow stem augers. The inner rod/sampler assembly was then driven eighteen (18) inches at each designated sampling interval using a 140-pound hammer in general accordance with procedures outlined in ASTM D-1586. The sampler was then withdrawn, opened for examination, and the sample transferred to laboratory prepared glassware.

Samples were transferred from the sampler directly to sterilized glass jars with teflon-sealed lids furnished by the project laboratory. Samples were stored in an iced chest at the site and cold-archived in our laboratory. During this preliminary assessment phase, samples were not submitted for laboratory analysis, but were field screened for hydrocarbon vapor concentrations in headspace using drager tubes.

During drilling, a field log was made for each boring. Information recorded versus corresponding depth included visually observable physical characteristics including general soil description (Unified Soil Classification System), color, texture, relative density (N-value), moisture, plasticity, dilatency, etc.

* PHASE 2 - Soils Excavation, Tank Removal, Confirmation Sample Analysis

Following the preliminary drilling exploration, excavation of contaminated soils resumed. An environmental engineer from our firm was present on the site from August 10th to August 12th to witness excavation activities. Objectives for our site visit included:

1. Identification of contaminated soils using field screening techniques including visual indications, odors, and drager tubes.

2. Confirmation sampling of soils for subsequent laboratory analysis according to EPA/WDOE protocol.

Tank Removal Activities

During the course of the excavation work, three additional unexpected USTs were uncovered at shallow depths. These included:

Tank #	Size(gal)	Contents	Location
1	1,000	gasoline	northeast
2	1,000	oil	northeast
3	1,800	gasoline	west central

Prior to commencement of closure effort, all three tanks uncovered on the site were conditioned in a manner consistent with guidelines offered for such work in API Recommended Practice 1604 (Removal and Disposal of Underground Petroleum Storage Tanks), and API Publication 2015. Before attempting to remove the tanks, the carbon dioxide concentration within the tanks was verified by the Seattle Fire Marshall's Office to assure that the potential for explosion was minimized.

With the tanks properly trucked off-site, excavation continued.

Soil Sampling

With respect to details of soil sampling, following current Washington Department of Ecology (WDOE) guidelines, we obtained a soil sample from the sides of the excavation, and from the bottom of the excavation. Samples were placed in sterilized glass jars with teflon-sealed lids furnished by the project laboratory. Samples were stored in an iced chest at the site and taken to the lab in this condition in an effort to preserve sample integrity by minimizing excessive dissipation of volatile fraction hydrocarbons. Each jar was clearly labeled as to sampling location, time of sampling, sampling person, project number, etc. EPA-recommended protocol for sample management, including maintenance of chain-of-custody documentation, was observed during the course of the project.

Laboratory Analysis

As gasoline and oil were reportedly stored in the tanks during their operating life, EPA Method 8015 modified for gasoline, and EPA Method 418.1 for total petroleum hydrocarbons (TPH) were used to analyze the selected samples. These methods provide a basis for comparison of site conditions to allowable residual hydrocarbon concentrations at UST sites offered in current WDOE guidelines.

RESULTS OF SITE REMEDIATION AND UST CLOSURE

Observations During Tank Removal

Removal of the tanks proceeded on August 10, 1990 when the atmosphere inside the tanks was pronounced safe by the Seattle Fire Marshall's representative. All three tanks were single-wall, coated steel. The 1,000-gallon tanks measured four feet in diameter and 12 feet in length. The 1,800-gallon-capacity tank measured six feet in diameter and nine feet in length. The three tanks were in very good condition with protective coatings virtually intact and only minor rusting. The rust and corrosion did not penetrate beyond the surficial skin of the tank and no holes or defects were observed in the tanks.

Soil Conditions

In general, the soils in the vicinity of the site consist of a variety of fill materials, including brick, concrete, sand, and wood chips. During our series of borings, we noted a very dense, clayey silt stratum or "floor" at a depth of approximately 25 feet which appears to underlie the entire site. No groundwater was encountered within the 36-foot depth of exploration during our boring program. Based on local surface topography, the inferred groundwater flow direction would be toward the west or northwest.

Remedial Action

Site soils were excavated on August 10 through August 12. As previously noted, contaminated soils were identified through field screening techniques including visual indications, odors and use of drager tubes.

A volume of petroleum-affected soil estimated at approximately 1,300 cubic yards was removed. This material was kept segregated on the site. It is our understanding that the affected soils will be remediated on the site through aeration.

Hydrocarbon Analysis of Soil

Composite samples were collected from the walls and floor of the excavation. Table A appended to this report provides a summary of the results of "confirmation" soil sampling on the property.

As previously noted, EPA Methods 418.1 for total petroleum hydrocarbons (TPH) and 8015 modified for gasoline were used for analysis.

CONCLUSIONS

Following excavation of contaminated soils, a comparison of the confirmation soil test results with the WDOE cleanup guidelines for UST closure, suggests that residual hydrocarbon concentrations present in the soil at the site at the time of closure were well within existing and proposed cleanup standards.

Based on the information developed as a result of this closure investigation, it appears that the contaminated soils with hydrocarbon concentrations exceeding WDOE-recommended guidelines have, to the greatest extent practical, been removed from the ground and segregated for aeration treatment and disposal. Having satisfied the site assessment requirements of 40 CFR, parts 280.71 and 280.72 in a manner consistent with the guidelines for such actions provided by the Washington Department of Ecology, and having found no residual hydrocarbon contamination exceeding limits prescribed under prevailing regulatory guidelines of this state, we conclude that no further characterization of this tank installation is required and that it has been properly closed in conformance with the intent and purpose of federal and state regulations/guidelines.

LIMITATIONS

This report has been prepared for the exclusive use of Mr. Victor Odermat, Car Wash Enterprises, Inc., and their representatives for specific application to this site. Our

work for this project was conducted in a manner consistent with that level of care and skill normally exercised by members of the environmental science profession currently practicing under similar conditions in the area. No other warranty is expressed or implied. If new information is developed in future site work which may include excavation, borings, studies, etc., Geotech Consultants, inc. should be allowed to reevaluate the conclusions of this report and to provide amendments as required.

We appreciate the opportunity to provide environmental consulting services on this project and we trust that the information provided here will be of value in your planning efforts. If there are any questions, or if we can be of further service, please contact us.

Respectfully submitted,

GEOTECH CONSULTANTS, INC.

Sean P. O'Brien
Environmental Engineer

REGISTERED ENVIRONMENTAL ASSESSOR
DON W. SPENCER
No. 876
Expires 6/91
STATE OF CALIFORNIA

Don W. Spencer, M.Sc.
Vice President
Environmental Services

Registered UST Site Assessor/
Licensed UST Supervisor
Washington Dept. of Ecology

Attachments: Plate 1, Vicinity Map
Plate 2, Site Exploration Plan
Plates 3 - 9, Boring Logs
Chain-of-Custody Forms
Laboratory Results

Attachments

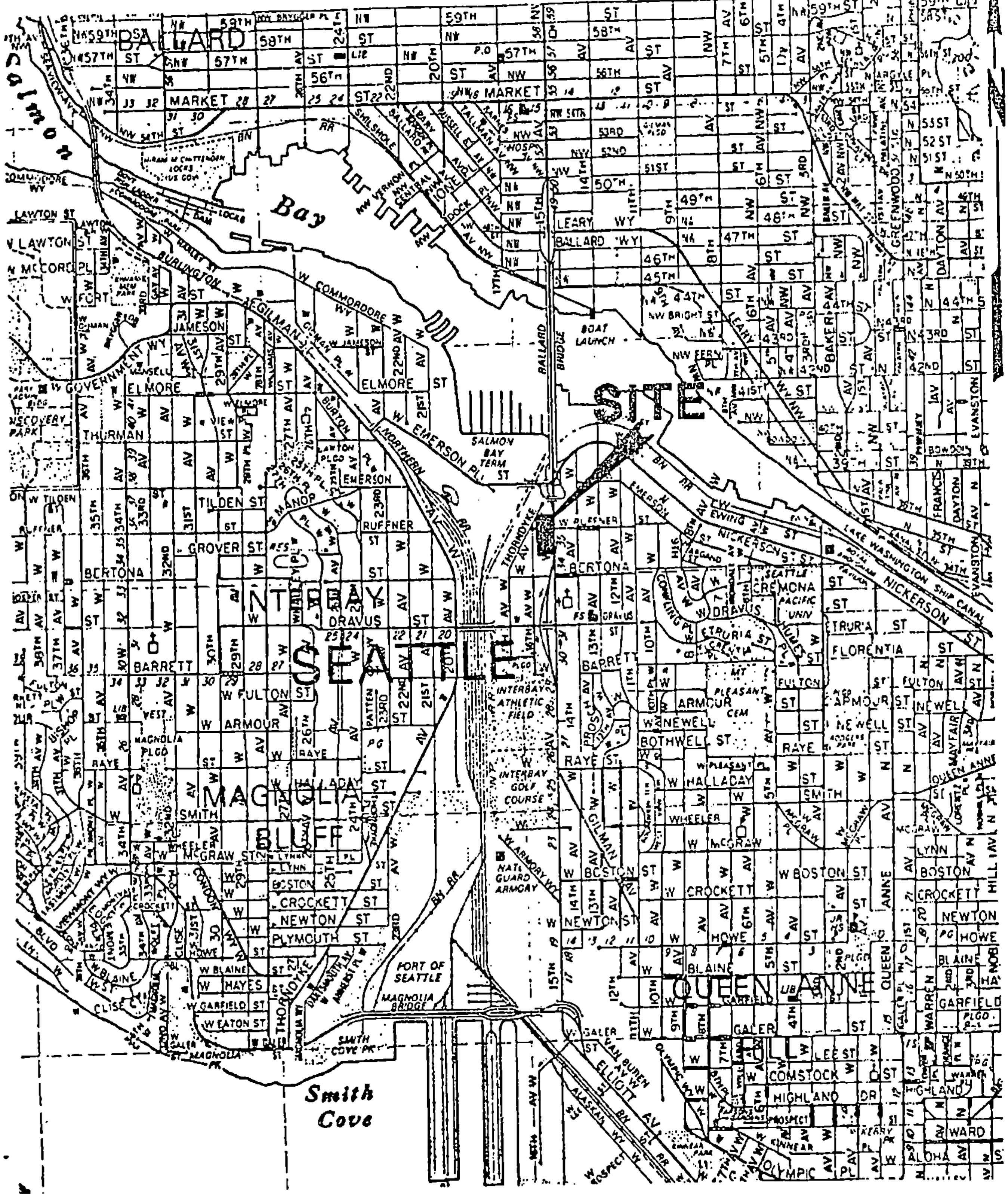
SPO/DWS:cka

TABLE 1

Summary of Laboratory Results
Confirmation Hydrocarbon Sampling

Sample #	Location	EPA Method 418.1	EPA Method MOD 8015 602	WDOE Guideline Stds. 418.1	8015
Floor	floor	<25	<1	200	100
Ewall-1	east wall	<25	<1	200	100
Ewall-2	east wall	<25	<1	200	100
Wwall-1	west wall	44	<1	200	100
Wwall-2	west wall	40	<1	200	100
Nwall-1	north wall	40	<1	200	100
Nwall-2	north wall	55	<1	200	100

Note: All numbers in table are in units of parts per million (ppm).

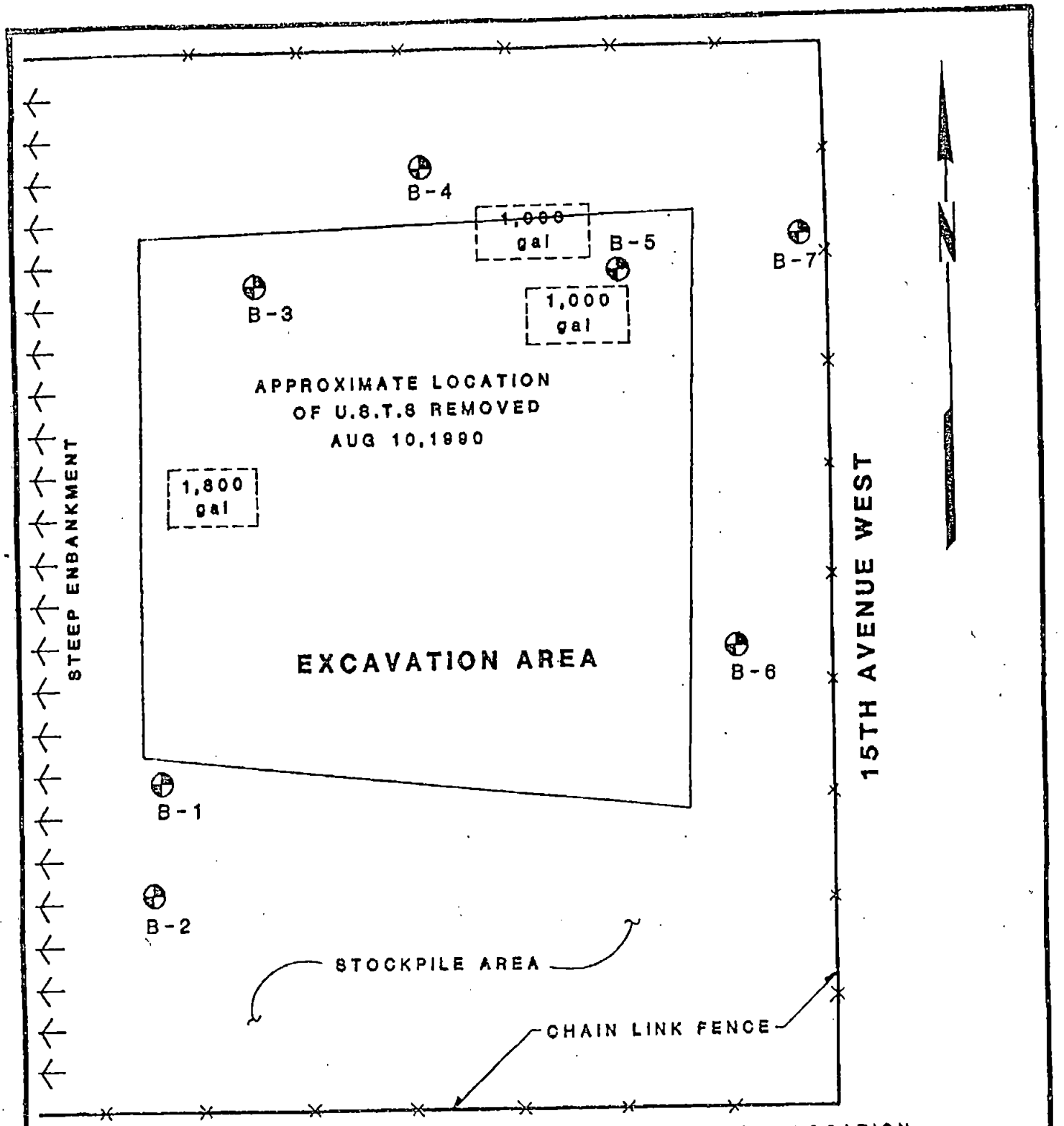


GEOTECH CONSULTANTS, INC.

VICINITY MAP

3435 - 15TH AVENUE WEST
SEATTLE, WASHINGTON

Job No: 0186	Date: OCT. 1990		Plate: 1



CAR WASH FACILITY

GEOTECH CONSULTANTS

SITE EXPLORATION PLAN
CAR WASH ENTERPRISES
3435 15TH AVE. W.
SEATTLE, WASHINGTON

Job No.:	Date:		Plate:
0188	NOV 1990		2

BORING 1

Moisture Content(%)	Sample	Blows per Foot	USCS	Description	HEAD SPACE ANALYSIS (ppm)
	1	5	SM	Brown, mottled, silty SAND, (organics noted) (Fill) moist, loose.	
	2	8	ML	Tan, sandy SILT, (concrete fragments noted) (fill) moist.	
	3	7			
	4	3			
			FILL	Moist fill (wood chips)	HC = 30ppm
	5	10		Brown, silty SAND, wet, medium dense.	HC = none detected
	6	21			
	7	63	SM		
	8	35			
	9	>50			
	10	40	ML	Tan, slightly sandy SILT, wet, very dense.	HC = none detected

Test boring completed at 36.5 feet on 8/6/90.
Groundwater encountered at 24 feet during drilling.
HC denotes hydrocarbon measurements using headspace analysis.

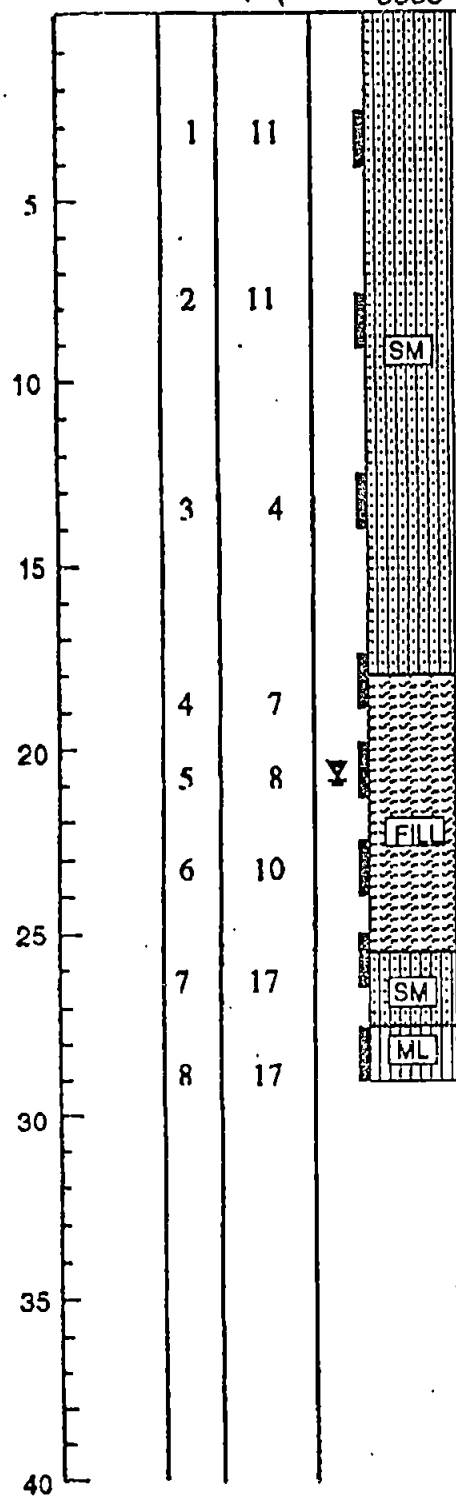
GEOTECH
CONSULTANTS, INC.

TEST BORING LOG

3435 - 15TH AVENUE WEST
SEATTLE, WASHINGTON

Job No:	Date:	Logged by:	Plate
0186	OCT. 1990	SPO	3

BORING 2



Brown-black, silty SAND with occasional gravel and fragments (fill), moist, medium dense.

Becomes rust brown.

HC = none detected

Brown/tan fill, (wood chips), (decaying odor)

HC = none detected

Gray, slightly silty SAND, wet, medium dense.

HC = none detected

Brown SILT, wet, med. dense

Test boring terminated at 23 feet on 8/6/90.
No groundwater encountered during drilling.
HC denotes hydrocarbon measurements using headspace analysis.

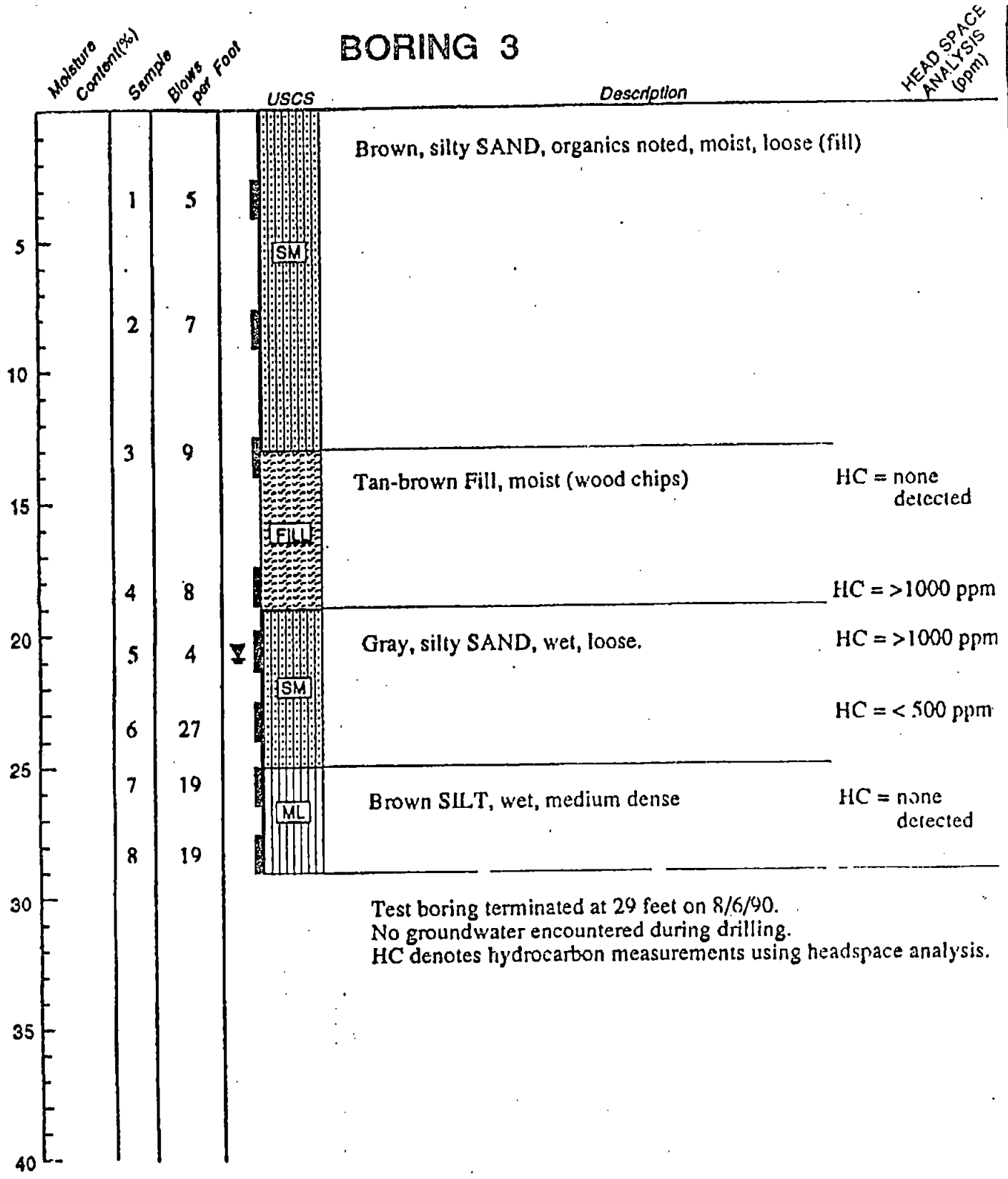
GEOTECH
CONSULTANTS, INC.

TEST BORING LOG

3435 - 15TH AVENUE WEST
SEATTLE, WASHINGTON

Job No:	Date:	Logged by:	Plate
0186	OCT. 1990	SPO	4

BORING 3



Test boring terminated at 29 feet on 8/6/90.
No groundwater encountered during drilling.
HC denotes hydrocarbon measurements using headspace analysis.

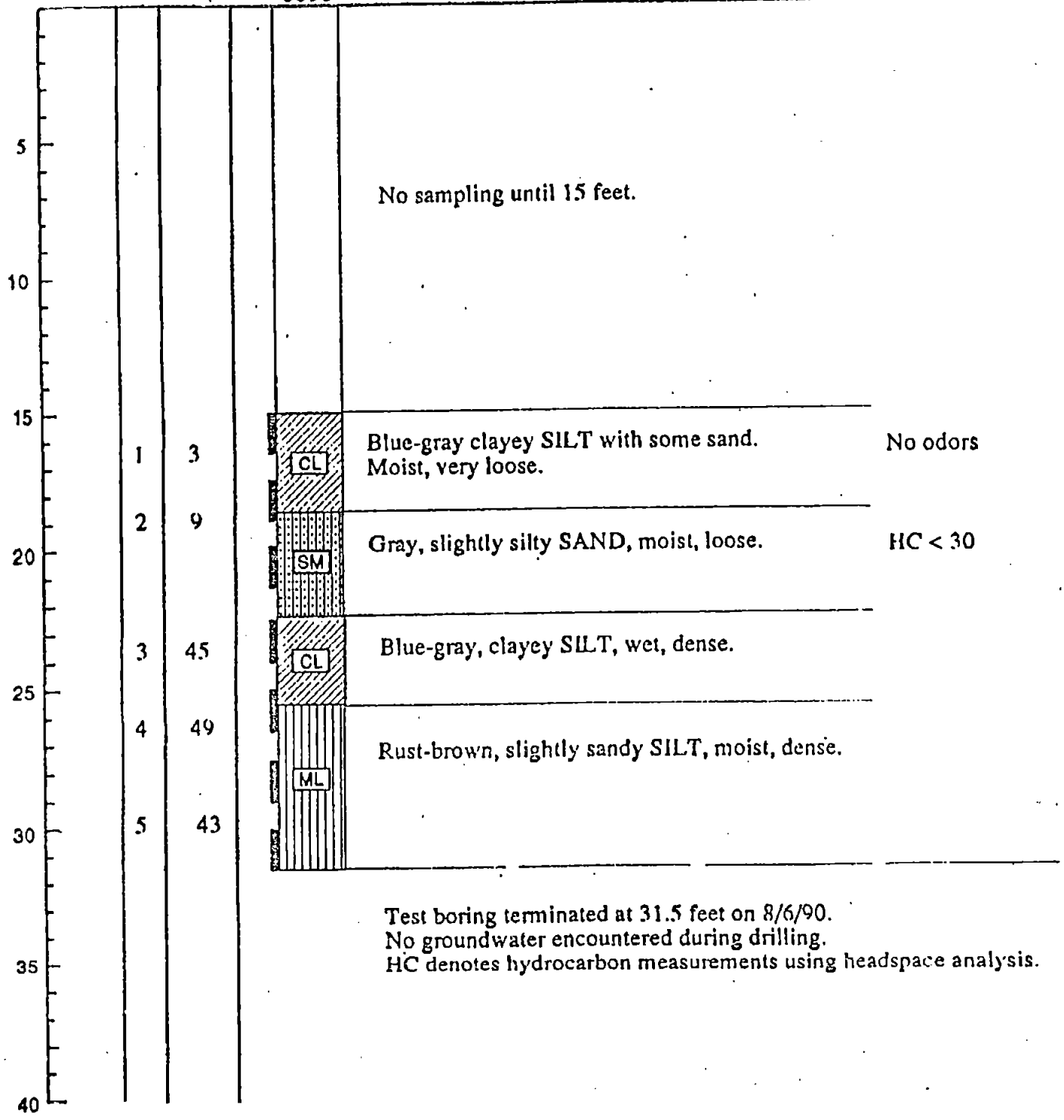
GEOTECH
CONSULTANTS, INC.

TEST BORING LOG

3435 - 15TH AVENUE WEST
SEATTLE, WASHINGTON

Job No:	Date:	Logged by:	Plate
0186	OCT. 1990	SPO	5

BORING 4



Test boring terminated at 31.5 feet on 8/6/90.
No groundwater encountered during drilling.
HC denotes hydrocarbon measurements using headspace analysis.

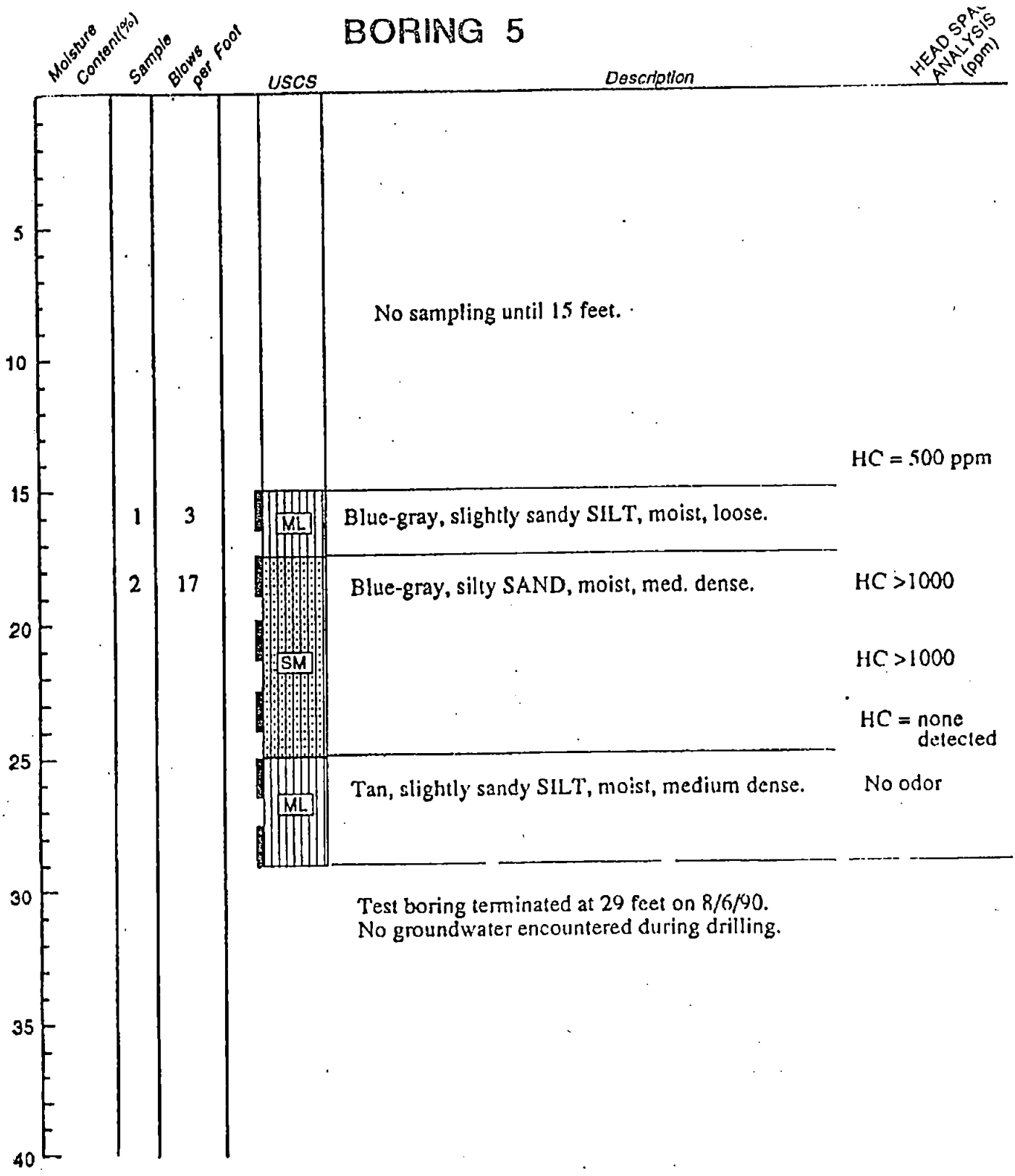
GEOTECH
CONSULTANTS, INC.

TEST BORING LOG

3435 - 15TH AVENUE WEST
SEATTLE, WASHINGTON

Job No:	Date:	Logged by:	Plate
0186	OCT. 1990	SPO	6

BORING 5



GEOTECH
CONSULTANTS, INC.

TEST BORING LOG

3435 - 15TH AVENUE WEST
SEATTLE, WASHINGTON

Job No:	Date:	Logged by:	Plate
0186	OCT. 1990	SPO	7

BORING 6

Moisture Content(%)	Sample	Blows per Foot	USCS	Description	HEAD SPACE ANALYSIS (ppm)
				No sampling until 12.5 feet.	
	1	5	ML	Blue-gray, sandy SILT, moist, loose	No odor
	2	10	SM	Gray, very silty SAND, moist, medium dense.	No odor
	3	23	ML	Blue-gray, slightly sandy SILT, moist, med. dense.	No odor
	4	56			No odor
	5	24			No odor
	6	15	CL	Gray, clayey SILT, moist, medium dense.	
	7	18			

Test boring terminated at 29 feet on 8/6/90.
No groundwater encountered during drilling.

GEOTECH
CONSULTANTS, INC.

TEST BORING LOG

3435 - 15TH AVENUE WEST
SEATTLE, WASHINGTON

Job No:	Date:	Logged by:	Plate
0186	OCT. 1990	SPO	8

BORING 7

Moisture Content(%)	Sample	Blows per Foot	USCS	Description	HEAD SPACE ANALYSIS (ppm)
				No sampling until 12.5 feet.	
	1	5	SM	Gray, silty SAND, moist.	No odor
	2	7			No odor
	3	10			
	4	23		Becomes mottled, brown below 20 feet.	No odor
	5	20	ML	Brown SILT, moist, medium dense.	No odor
	6	25			

Test boring terminated at 29 feet on 8/6/90.
No groundwater encountered during drilling.

GEOTECH
CONSULTANTS, INC.

TEST BORING LOG

3435 - 15TH AVENUE WEST
SEATTLE, WASHINGTON

Job No:	Date:	Logged by:	Plate
0186	OCT. 1990	SPO	9

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: September 18, 1990
Date Submitted: September 10, 1990
Project: CWE 0186

RESULTS OF ANALYSES OF THE SOIL SAMPLES
FOR GASOLINE BY GC/FID (MODIFIED 8015)
Results Reported as µg/g (ppm)

Sample #	Gasoline (ppm)
FLOOR	<1
E WALL	<1
Quality Assurance	
Method Blank	<1
FLOOR (Duplicate)	<1
FLOOR (Matrix Spike) Spiked @ 500 ppm Percent Recovery	96%
FLOOR (Matrix Spike Duplicate) Spiked @ 500 ppm Percent Recovery	94%

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: September 18, 1990
Date Submitted: September 10, 1990
Project: CWE 0186

RESULTS OF ANALYSES OF THE SOIL SAMPLES
FOR TOTAL PETROLEUM HYDROCARBONS
BY IR (EPA METHOD 418.1)
Results Reported as µg/g (ppm)

Sample #	Total Petroleum Hydrocarbons (ppm)
FLOOR	<25
E WALL	<25
Quality Assurance	
Method Blank	<25
E WALL (Duplicate)	<25
E WALL (Matrix Spike) Spiked @ 200 ppm Percent Recovery	115%
E WALL (Matrix Spike Duplicate) Spiked @ 200 ppm Percent Recovery	97%

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: September 18, 1990
Date Submitted: September 12, 1990
Project: CWE 0186

RESULTS OF ANALYSES OF THE SOIL SAMPLES
FOR GASOLINE BY GC/FID (MODIFIED 8015)
Results Reported as µg/g (ppm)

Sample #	Gasoline (ppm)
E WALL 2	<1
W WALL 1	<1
W WALL 2	<1
N WALL 1	<1
N WALL 2	<1
Quality Assurance	
Method Blank	<1
W WALL 2 (Duplicate)	<1
W WALL 2 (Matrix Spike) Spiked @ 500 ppm Percent Recovery	72%
W WALL 2 (Matrix Spike Duplicate) Spiked @ 500 ppm Percent Recovery	76%

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: September 18, 1990
Date Submitted: September 12, 1990
Project: CWE 0186

RESULTS OF ANALYSES OF THE SOIL SAMPLES
FOR TOTAL PETROLEUM HYDROCARBONS
BY IR (EPA METHOD 418.1)
Results Reported as µg/g (ppm)

Sample #	Total Petroleum Hydrocarbons (ppm)
E WALL 2	<25
W WALL 1	44
W WALL 2	40
N WALL 1	40
N WALL 2	55
Quality Assurance	
Method Blank	<25
W WALL 2 (Duplicate)	91
W WALL 2 (Matrix Spike) Spiked @ 200 ppm Percent Recovery	140%
W WALL 2 (Matrix Spike Duplicate) Spiked @ 200 ppm Percent Recovery	115%

FRIEDMAN & BRUYA, Inc.
3008-B 16th Avenue West
Seattle, WA 98119

Chain of Custody Record

SAMPLED BY: SEAN O'BRIEN DATE: 9/12/90

PROJECT NAME: CWE 0186
PROJECT LOCATION: 15th Avenue
SITE NUMBER:

Sample Number	Date / Time Sampled	Type of Sample	# of Containers	Lab Sample #	Analyses Required	Comments
FLOOR	9/10 pm	Soil	1		418.1 & mod 8015 gas only	
E WALL	9/10 pm	Soil	1		418.1 & mod 8015 gas only	

Relinquished by: (Signature)
NAME: Sean J. O'Brien
FIRM: GeoTech
Date: 9/12/90
Time: 2:05 pm

Relinquished by: (Signature)
NAME:
FIRM:
Date:
Time:

Received by: (Signature)
NAME:
FIRM:
Date:
Time:

Received by: (Laboratory)
NAME:
FIRM: Friedman and Bruya, Inc.
Date:
Time:

FBI Client:

Additional Comments:

FRIEDMAN & BRUYA, Inc.
3008-B 16th Avenue West
Seattle, WA 98119

Chain of Custody Record

SAMPLED BY: SEAN O'BRIEN DATE: 9/12/90

PROJECT NAME: 0186 (CWE)
PROJECT LOCATION: 15th Avenue
SITE NUMBER:

Sample Number	Date / Time Sampled	Type of Sample	# of Containers	Lab Sample #	Analyses Required	Comments
E WALL 2	9/12 am	Soil	1		418.1 & 8015 gas only?	
W WALL 1			1			44 ppm TPH
W WALL 2			1			40
N WALL 1			1			340 ppm (asphalt piece)
N WALL 2			1			55 ppm

Relinquished by: (Signature)
NAME: Sean J. O'Brien
FIRM: GeoTech
Date: 9/12/90
Time: 12:15

Relinquished by: (Signature)
NAME:
FIRM:
Date:
Time:

Received by: (Signature)
NAME:
FIRM: FB, I
Date: 9/12/90
Time: 12:15

Received by: (Laboratory)
NAME:
FIRM: Friedman and Bruya, Inc.
Date:
Time:

FBI Client:

Additional Comments:

GEOTECH CONSULTANTS

(206) 747 5618
(206) 343 7959
13256 N.E. 20th St. (Northup Way), Suite 16
Bellevue, WA 98005

DAILY FIELD REPORT

TRAVEL/PREP. TIME	JOB NO. 0186
TIME ON SITE	MILES 32
TIME OFF SITE	PAGE 1 OF 1
WEATHER	VISITORS
CLIENT/OWNER Car Wash Ent.	PERMIT NUMBER
JOB LOCATION 3435 - 15th Ave West Seattle	DATE 7-10-90 / DAY OF WEEK Tues
GENERAL CONTRACTOR / GENERAL CONTRACTOR'S SUPT.	HRS. CHARGED 2 1/2
GRADING CONTRACTOR / GRADING FOREMAN	

on site to monitor remedial activities on old gasoline tank site

Tanks removed from site 3-4 years ago there was a noticable odor of residual hydrocarbons observed at the time of tank removal. At least one tank that was removed was observed to have numerous small holes in the bottom. The tanks had been out of service for several years prior to removal.

To monitor the remediation of the site samples of the excavation walls and floor were monitored in the field by using gastec, ~~Explosimeter~~ gasoline vapor ~~Meter~~ sensitive Analyzer (Drager) tubes, a Sensidyne Air pump and Headspace sample jar Technology duplicate samples were collected for laboratory confirmation analysis as required.

Results 7-10

		Field sample	
West wall:	12-15' depth	None detected	lab Sample
North wall:	12-15' depth	None detected	lab Sample
Bottom:	15-18' soil and wood chips	800ppm	

NEXT SITE VISIT: 7-11-90 8:00 AM

COPY TO:

SIGNATURE: John F Cole

GEOTECH CONSULTANTS

(206) 747-5618
(206) 343-7959
13256 N.E. 20th St. (Northup Way), Suite 16
Bellevue, WA 98005

DAILY FIELD REPORT

TRAVEL/PREP. TIME	JOB NO. 0186
TIME ON SITE	MILES 32
TIME OFF SITE	PAGE OF
WEATHER	VISITORS
CLIENT/OWNER Car Wash Ent	PERMIT NUMBER
JOB LOCATION 3435 - 15th Ave W Seattle	DATE 7-11-90 / DAY OF WEEK Wed
GENERAL CONTRACTOR / GENERAL CONTRACTOR'S SUPT.	HRS. CHARGED 3
GRADING CONTRACTOR / GRADING FOREMAN	

On site to monitor remediation activities continued from 7-10-90 - Soil removal to extend bottom of excavation containing hydrocarbon contamination, 7-10-90 Report indicated no detectable Gasoline Vapor concentrations by field screening, in West or North Wall in soils above thick wood chip layer. Abundant bottom contamination.

Results 7-11-90

gray silty sand underlying 5 feet or more of coarse wood chips field - 30 ppm at 21-22 feet ±

excavated 1 foot deeper 100 ppm at 23 ± feet

into medium grained sand 1000 + ppm at 24-25 ± feet maximum reach of trackhoe

Vertical extent of contamination unknown at this time. Possibility of contamination throughout fill section due to loose consistency and lack of a confining layer. It is not safe to enter excavation for samples, but can still get material from trackhoe bucket.

NEXT SITE VISIT: on call

COPY TO:

SIGNATURE: John F Cole

GEOTECH CONSULTANTS

(206) 747-5618
(206) 343-7959
13256 N.E. 20th St. (Northup Way), Suite 16
Bellevue, WA 98005

DAILY, FIELD REPORT

TRAVEL/PREP. TIME	JOB NO. 0186
TIME ON SITE	MILES 32
TIME OFF SITE	PAGE OF
WEATHER	VISITORS
CLIENT/OWNER	PERMIT NUMBER

JOB LOCATION: 3435 - 15th Avenue W SEATTLE Car Wash Est.
GENERAL CONTRACTOR | GENERAL CONTRACTOR'S SUPT.
GRADING CONTRACTOR | GRADING FOREMAN
DATE: 7/27/90 | DAY OF WEEK: Friday | HRS. CHARGED: 2

- On site to monitor drilling activities -
- Scope of work was to include:
  1) drilling 3 borings at selected locations to depths of 45'
  2) collection of soil samples for subsequent laboratory analysis

RESULTS/FINDINGS
- I arrived at 7:55 am and met Rodney Gilseth with R & R drilling.
- Together we observed the work site
- We found
  1) a 6' high chain link fence surrounding entire area - thus blocking access to the region
  2) Further, no areas had been cleared ~~to~~ of ~~other~~ large piles of earth/soil to allow us to drill in previously discussed "zones of interest"
  3) No representative of Car Wash Est. was on-site to discuss the situation

I released the drillers - we have plans to reschedule the proposed work for Monday or Tuesday (7/30 - 7/31) provided we coordinate movement of soil piles to gain access to areas for drilling

R & R has stated they will not charge Re-mobilization fees.

NEXT SITE VISIT:
COPY TO:
SIGNATURE: Dean L. Brown

GEOTECH CONSULTANTS

(206) 747-5618
(206) 343-7959
13256 N.E. 20th St. (Northup Way), Suite 16
Bellevue, WA 98005

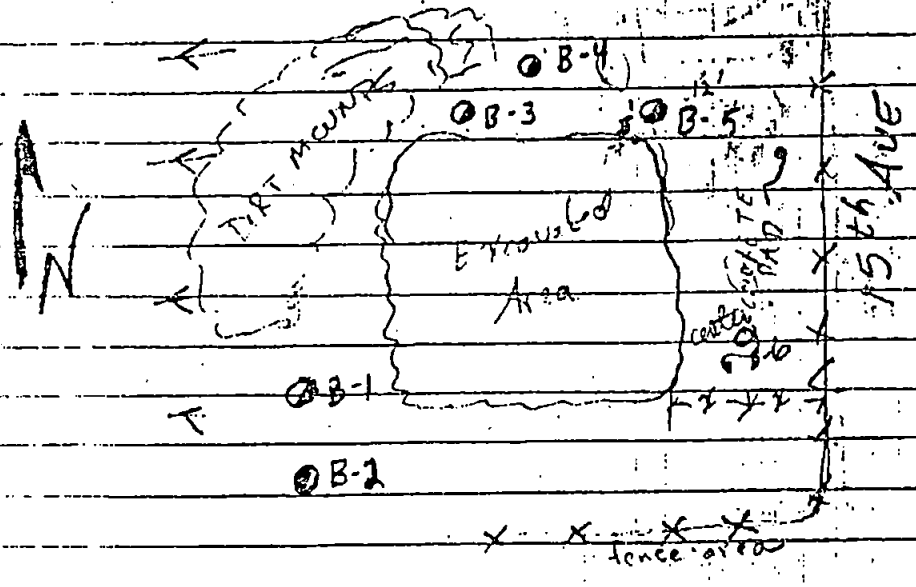
DAILY FIELD REPORT

TRAVEL/PREP. TIME: 1.5 hrs	JOB NO.: 0186
TIME ON SITE: 2 hrs' 8:00	MILES: 32
TIME OFF SITE: 4:00	PAGE: 1 OF 1
WEATHER: SUNNY	VISITORS:
CLIENT/OWNER: CAR WASH ENT	PERMIT NUMBER:
JOB LOCATION: 3435 15th Ave	DATE: 8/6/90
GENERAL CONTRACTOR:	DAY OF WEEK: MONDAY
GENERAL CONTRACTOR'S SUPT.:	HRS. CHARGED: 8½
GRADING CONTRACTOR: ASSOCIATED DRILLING: Ski	GRADING FOREMAN:

- ON-SITE TO DRILL BORINGS IN PREVIOUSLY AGREED UPON AREAS:

- MET W/ "Ski" of ASSOC. DRILLING & ED W/ CAR WASH AT 8:00 AM

- THE BORING SCHEDULE WAS AS FOLLOWS:



note: B2 & B4 were decided upon in the field

- RESULTS

B-1 : slight odor in wood chip layer @ 18'-23' (< 100 ppm)
B-2 : wood chips 18-25; no odors (all HC < 10 ppm)
B-3 : wood chips 13'-19'; odor in gray sand layer @ 20' (HC > xxx
B-4 : wood chips 13-14' only; No odors (all HC < 10 ppm)
B-5 : no wood chips; Contam. layer btwn. 13½ - 21' (HC > 10

"Hot Holes"

∴ see boring logs for further information.

NEXT SITE VISIT:

COPY TO:

SIGNATURE: Dan P. O'Brien

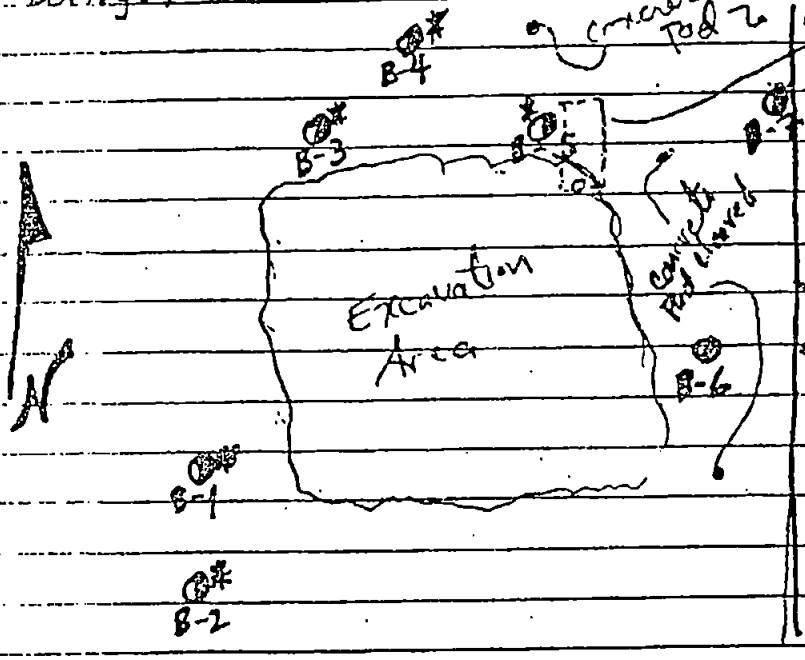
GEOTECH CONSULTANTS

(206) 747-5618
(206) 343-7959
13256 N.E. 20th St. (Northup Way), Suite 16
Bellevue, WA 98005

DAILY FIELD REPORT

TRAVEL/PREP TIME: 1½ hr	JOB NO.: 0186
TIME ON SITE: 8:00	MILES: 32
TIME OFF SITE: 11:00	PAGE: OF
WEATHER: Sunny	VISITORS:
JOB LOCATION: 3435 15th Ave South	CLIENT/OWNER: CARWASH EMPIRE
GENERAL CONTRACTOR:	GENERAL CONTRACTOR'S SUPT.:
GRADING CONTRACTOR: ASSOCIATED	GRADING FOREMAN: DRILLING ("Ski")
PERMIT NUMBER:	DATE: 8/10/20
DAY OF WEEK: FRIDAY	HRS. CHARGED: 3.0

- ON SITE TO DRILL TWO BORINGS
- MET WITH "Ski" and ED @ 8:00am; ARNIE on-site shortly thereafter -
- We all agreed on the following locations of the B-6 and B-7 borings:



* denotes previously drilled borings 8/6/20

RESULTS

* Both Borings were terminated at 30'
* No Hydrocarbon odors were noted for the entire depth of the borings

* A report complete w/ conclusions/recommendations will follow

NEXT SITE VISIT: to be scheduled

COPY TO:

SIGNATURE: Sean P. O'Brien

GEOTECH CONSULTANTS

(206) 747 5618
(206) 343 7959
13256 N.E. 20th St. (Northup Way), Suite 16
Bellevue, WA 98005

DAILY FIELD REPORT

TRAVEL/PREP. TIME: 1.0	JOB NO.: 0186
TIME ON SITE: 11:10am	MILES: 30
TIME OFF SITE:	PAGE: OF
WEATHER: Sun & mixed clouds	VISITORS:
CLIENT/OWNER:	PERMIT NUMBER:
JOB LOCATION: Brown Bear 15th Ave	DATE: 9/10/90
GENERAL CONTRACTOR:	GENERAL CONTRACTOR'S SUPT.:
GRADING CONTRACTOR:	GRADING FOREMAN:
DAY OF WEEK: MONDAY	HRS. CHARGED:

ON-SITE TO WITNESS EXCAVATION OF CONTAM. SOIL LOCATED IN NORTHERN END OF PROPERTY — Borings drilled previously ON THE SITE OUTLINED THE ANTICIPATED "PLUME" OF AFFECTED SOIL —

WE BEGAN EXCAVATING THE EAST WALL AND THE FLOOR - "clean" samples (Confirmation samples) were collected of the wall and floor

Sensidyne tube readings on the East Wall & floor were "undetected" → <10ppm

During excavation a 1,000 gal. capacity tank located along the north wall of the hole sloughed into the excavations

NEXT SITE VISIT:

COPY TO:

SIGNATURE:

GEOTECH CONSULTANTS

(206) 747 5618 13256 N.E. 20th St. (Northup Way), Suite 16
(206) 343 7959 Bellevue, WA 98005

DAILY FIELD REPORT

TRAVEL/PREP TIME	JOB NO. 2116
TIME ON SITE 8:00 am	MILES 30
TIME OFF SITE	PAGE OF
WEATHER Gray/overcast	VISITORS NW Envirosrvice, Fire Dept., Vic Oderm[illegible]
CLIENT/OWNER	PERMIT NUMBER

JOB LOCATION 3435 15th AVE (CWE)			
GENERAL CONTRACTOR	GENERAL CONTRACTOR'S SUPT.	DATE 9/11	DAY OF WEEK TUESDAY
GRADING CONTRACTOR	GRADING FOREMAN		HRS. CHARGED

ON SITE TO OBSERVE CONTINUING TANK CLOSURE ACTIVITIES / SOIL SAMPLING

AT THIS POINT, the East & South walls have been excavated & confirmation samples taken - The floor of the excavation is being uncovered in stages to accomodate the heavy trac-hoe

THREE TANKS WERE UNCOVERED DURING MONDAY'S (9/10) WORK. NW ENVIROSERVICE ARRIVED AT 10:40 and rinsed the tanks. Dry ice was added & checked for 60% CO_2 by the Fire Dept.

TANK #	DIMENSIONS (D×H)	GALLONS	CONVERSION ft³→gal
1	4' × 12'	@ 1,000	$(\pi r^2 h)(7.48\ g/ft^3)$
2	4' × 12'	"	
3	6' × 9'	$(3.14)(9)(9)(7.48) =$	

The tanks were hauled off site

Excavation of contam. material continued ... and will begin again on Wed. 9/12 @ 8:00 am.
~~At [illegible]:00 pm~~

NEXT SITE VISIT:

COPY TO:

SIGNATURE: [signature]

GEOTECH CONSULTANTS

(206) 747-5618
(206) 343-7959
13256 N.E. 20th St. (Northup Way), Suite 16
Bellevue, WA 98005

DAILY FIELD REPORT

TRAVEL/PREP. TIME: 1.0	JOB NO.: 0186
TIME ON SITE: 8:00am	MILES: 30
TIME OFF SITE:	PAGE: OF
WEATHER: Fog/Overcast	VISITORS:
CLIENT/OWNER: CWE	PERMIT NUMBER:
JOB LOCATION: 3435 15th Avenue	DATE: 9/12
GENERAL CONTRACTOR:	GENERAL CONTRACTOR'S SUPT.:
GRADING CONTRACTOR:	GRADING FOREMAN:

DAY OF WEEK: WED
HRS. CHARGED:

... ON-SITE TO OBSERVE CONTINUING SOIL CLEANUP ACTIVITIES

Work was concentrated on the northern and western boundaries of the contamination

In brief summary:

1) The floor of the entire excavation lies at approximately 25 feet where a very stiff tan silt layer is located
2) Confirmation samples of the four walls & floor were collected -

Because the excavation was completed in stages - samples were composited for laboratory analysis

- We concluded excavation at 12:00 noon -
- We estimate that 1,400 cu. yds of contam. soil were removed - plans for remediation include on-site land farming

NEXT SITE VISIT: to be scheduled

COPY TO: FILE

SIGNATURE: Stan P. O'Brien

APPENDIX C

LIMITED SUBSURFACE SITE EXPLORATION AT BROWN BEAR CAR WASH--INTERBAY SHANNON & WILSON, INC. JUNE 3, 1994

T-1540-01

Limited Subsurface Site Exploration at Brown Bear Car Wash, Interbay Seattle, Washington

June 1994

Car Wash Enterprises
3977 Leary Way N.W.
P.O. Box 70527
Seattle, Washington 98107-0527

SHANNON & WILSON, INC.
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS
400 N. 34th St. ▫ Suite 100
P.O. Box 300303
Seattle, Washington 98103
206 ▫ 632 ▫ 8020

OnSite Environmental Inc.

May 13, 1994
Lab Traveler #:05-004

Brian Clark
Shannon & Wilson, Inc.
400 N 34th Street, Suite 100
Seattle, WA 98103

Dear Brian:

Enclosed are the results of the analyses of samples submitted on May 3, 1994 from Project T-1540.

We appreciate this opportunity to be of service to you on this project. If you have any questions regarding this report, please feel free to call me.

Sincerely,

Karl P. Hornyik
Project Chemist

Enclosures

14924 NE 31st Circle • Redmond, WA 98052 • (206) 883-3881 • Fax (206) 885-4603

SHANNON & WILSON, INC.
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

SEATTLE
HANFORD
FAIRBANKS
ANCHORAGE
SAINT LOUIS
BOSTON

1954 40 1994

June 3, 1994

Car Wash Enterprises
3977 Leary Way N.W.
P.O. Box 70527
Seattle, Washington 98107-0527

Attn: Mr. Jim Hansen

RE: LIMITED SUBSURFACE SITE EXPLORATION AT BROWN BEAR CAR WASH, INTERBAY, SEATTLE, WASHINGTON

This letter summarizes the findings of a limited subsurface exploration performed at the Brown Bear Car Wash located at 3435 15th Avenue West, Seattle, Washington (Figure 1). The purpose of the subsurface exploration was to determine if petroleum hydrocarbon concentrations in the soil and groundwater on the northern portion of the site meet current state regulations for site closure. This work was authorized by Mr. Jim Hansen of Car Wash Enterprises by signed proposal number TP-8242-1, dated April 14, 1994.

Shannon & Wilson (S&W) drilled and installed two monitoring wells on May 2, 1994 (Figure 2). The borings were drilled by Environmental Drilling using a Mobile Drill B-61, equipped with a 4-inch inside diameter (I.D.) hollow-stem auger. Soil samples were described and examined for the presence of petroleum product. All soil samples were screened for the presence of volatile organic compounds using a photoionization detector (PID). Groundwater samples were collected for analysis on May 9, 1994.

BACKGROUND

An unknown number of underground storage tanks were removed in 1986, and three underground storage tanks and approximately 1,300 cubic yards of soil were removed in 1990. The samples collected from the tank excavation at that time contained a maximum concentration of 55 parts per million (ppm) by Environmental Protection Agency (EPA) method 418.1.

T-1540-01

400 NORTH 34TH STREET • SUITE 100
P.O. BOX 300303
SEATTLE, WASHINGTON 98103
206 • 632 • 8020 FAX 206 • 633 • 6777

SUBSURFACE CONDITIONS

MW-1

The upper 10 feet of soil is fill material, comprised of clayey, sandy silt. A petroleum odor was noted in both the 2.4- and 7.5-foot samples (Figure 3). The fill material is underlain by slightly silty, fine sand and an approximately 4-foot-thick silty clay layer at a depth of 26 feet. The clay layer is underlain by interlayered slightly silty, gravelly sand and sandy silt to the bottom of the borehole at a depth of 50 feet. Static water level was measured at 34.2 feet below the ground surface.

MW-2

Fill material in MW-2 is comprised of gravelly sand, wood and brick fragments, and extends from the surface to a depth of 18.5 feet (Figure 4). Petroleum odor was noted in samples from the near surface to an approximate depth of 14 feet. The fill is underlain by approximately 5 feet of clayey silt and silty clay (18.5 to 23.5 feet) and slightly silty, occasionally gravelly, sand to the bottom of the borehole at a depth of 44 feet. Static water level was measured at 32.9 feet below the ground surface.

FIELD PROCEDURES

Soil Sampling

The auger flights were steam-cleaned prior to drilling each borehole. Soil samples were collected with a standard split-spoon sampler at 5-foot intervals beginning at a depth of 2.5 feet. The sampler was washed with alconox and rinsed with distilled water prior to collecting each sample. The site geologist changed nitrile gloves prior to handling each sample. Soil was transferred from the sampler to a disposable aluminum tray using a stainless steel disposable spoon. The soil was immediately placed in the sample jar and sealed. The remaining soil was placed in a ziploc bag and screened for volatile compounds using the PID. Soil cuttings were placed on visqueen, covered, and left on-site.

Groundwater Sampling

The boreholes were completed with 2-inch polyvinyl chloride (PVC) which are screened across the water table. The wells were developed using air on May 3, 1994. Groundwater samples were collected on May 9, 1994, and analyzed for gasoline and benzene, toluene, ethylbenzene, and xylenes (BTEX).

ANALYTICAL RESULTS

Three soil samples from each borehole were submitted for WTPH-HCID analysis. Results are presented in Table 1. Total petroleum hydrocarbon (TPH) was detected in only one sample (1540B2S3) from MW-2 (12.5 feet). The highest PID reading (27.1 ppm) was also recorded for this sample and may be associated with lenses of petroleum-contaminated sand. Both gasoline (82 ppm) and oil range (970 ppm) hydrocarbons were detected in this sample. Low concentrations of toluene, ethylbenzene, and xylenes were also detected. Petroleum contamination was not detected in the 22.5-foot sample from this borehole. Analytical data sheets are presented in Appendix A.

Detected concentrations are below the February 1991 Model Toxics Control Act (MTCA) Method A cleanup level with the exception of oil 12.5 feet in MW-2. The cleanup level for oil is 200 ppm.

Groundwater samples from each well were collected and analyzed for gasoline and BTEX. These compounds were not detected in the groundwater.

CONCLUSIONS AND RECOMMENDATIONS

A petroleum odor was noted in soil samples to a depth of 7.5 feet in MW-1 and to a depth of 14 feet in MW-2. Petroleum contamination consisting of oil range hydrocarbons in excess of the regulatory cleanup level were detected in the sample from 14 feet in MW-2. Based upon the analytical results and historical knowledge of the site provided by Car Wash Enterprises, there appears to be pockets of petroleum hydrocarbons in excess of the regulatory cleanup level which were not removed during previous cleanup activities; the actual extent of which is unknown.

Gasoline and BTEX concentrations in the two groundwater samples collected at the site were not detected. We recommend a minimum of one additional groundwater sampling event in the next three to six months to confirm these results.

The data presented in this report are based on limited subsurface exploration and testing and should be considered representative at the time of our observations. S&W performed this work within our best judgment to adequately describe site conditions at the site. Changes in the conditions of the property can occur with time from both natural processes and human activities. In addition, change in governmental codes, regulation, or law may occur. Due to such changes, our observations and recommendations applicable to this site may need to be revised wholly or in part, due to changes beyond our control.

This report was prepared for the exclusive use of Car Wash Enterprises and in no way guarantees that an agency of its staff will reach the same conclusions as S&W. S&W has prepared the attached "Important Information About Your Environmental Site Evaluation/Assessment Report" to assist you and others in understanding the use and limitations of our reports.

If you have any questions regarding this letter, please call us at (206) 632-8020.

Respectfully,

SHANNON & WILSON, INC.

Dawn Wulf
Hydrogeologist

JESS T. ABED
STATE OF WASHINGTON
REGISTERED PROFESSIONAL ENGINEER
6-3-94
EXPIRES 12/11/95

Jess T. Abed, P.E.
Vice President

DW:JTA/dw

Enclosures: Table 1 - Analytical Results
Figure 1 - Vicinity Map
Figure 2 - Site Exploration Plan
Figure 3 - Boring Log-MW-1
Figure 4 - Boring Log MW-2
Appendix A - Copy of Analytical Results
Appendix B - Important Information About Your Environmental Site Evaluation/Assessment Report

T1540-01.LTR/T1540-lkd/lkd

TABLE 1.
ANALYTICAL RESULTS
CAR WASH ENTERPRISES
INTERBAY

Sample Number	Depth (ft)	PID	HCID	WTPH-418.1 (ppm)	WTPH-Gasoline (ppm)	Benzene (ppm)	Toluene (ppm)	Ethyl Benzene (ppm)	m,p-xylene (ppm)	o-xylene (ppm)
1540B1S2	7.5	19.0	ND							
1540B1S3	12.5	1.0	ND							
1540B1S8	37.5	1.4	ND							
1540B2S3	12.5	27.1	970	970	82	ND	0.13	0.47	0.73	0.8
1540B2S5	22.5	3.4	ND							
1540B2S7	32.5	0.2	ND							
Cleanup Level for Soil (1)				200	100	0.5	40	20	20	

(1) Washington Model Toxics Control Act (MTCA) Method A, February 1991

0 1/4 1/2 1

Scale in Miles

NOTE

Map adapted from USGS topographic map of Seattle North, WA quadrangle, dated 1983.

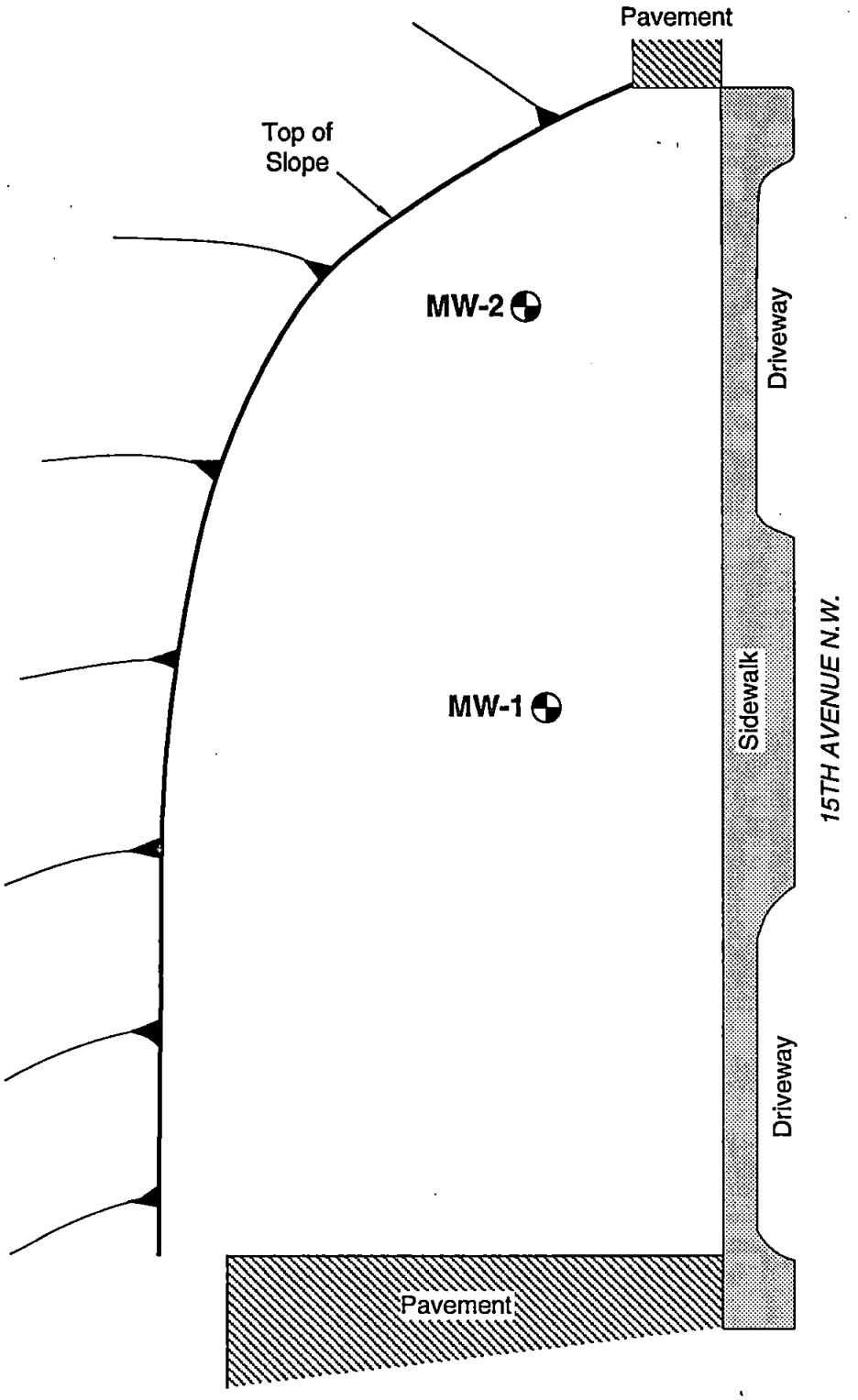
Car Wash Enterprises - Interbay
Seattle, Washington

VICINITY MAP

June 1994 T-1540-01

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

FIG. 1



0 10 20 40

Scale in Feet

LEGEND

MW-1 Monitoring Well Designation and Approximate Location

Car Wash Enterprises - Interbay
Seattle, Washington

SITE AND EXPLORATION PLAN

June 1994 T-1540-01

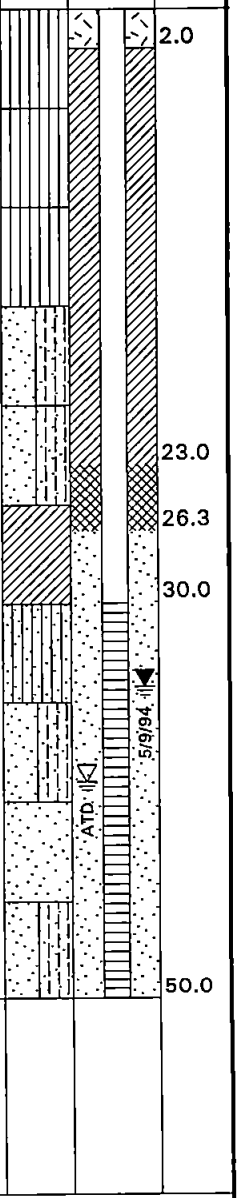
SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

FIG. 2

ENVIRONMENTAL BOREHOLE LOG

Date Started 5/2/94	Location 3435 15th Ave. West, Seattle	Depth Water First Encountered (Ft) 39.0
Date Completed 5/2/94	Drilling Company Environ. Drilling	Drilling Method Hollow-Stem Auger
Total Depth (Ft) 50.0	Sampling Method Split-spoon	Hammer: Weight (lbs) 140 Drop (In) 30
Borehole Diam. (In) 8	Ground Elev. N/A / Monument Elev. N/A	PVC Elev. N/A

Depth (Ft)	Sample Number	Interval	Blow Counts/6 In	Recovery(%)	PID (ppm)	Time	Depth (Ft)	Lithologic Description	USCS* Symbol
								Ground Surface	
0			6/6/10	33	15.8	0845		Medium dense, brown-gray, slightly clayey, sandy SILT; moist; organic matter; petroleum odor; (Fill).	ML
5							5.0	Loose, mottled brown-gray, slightly clayey, sandy SILT; moist; organic matter; slight petroleum odor; (Fill).	ML
10	1540 B1S2		3/3/3	100	19.0	0855	10.0	Medium stiff, brown-gray, clayey SILT; moist; no odor (native material?).	ML
15	1540 B1S3		3/3/5	25	1.0	0900	15.0	Medium dense, gray, slightly silty, fine to medium SAND, lenses of silt; moist.	SP-SM
20			3/6/10	75	0.4	0915	20.0	Dense, gray-brown, slightly silty, fine SAND; moist; iron-oxide staining.	SP-SM
25			20/27 28	100	2.0	0920	25.0	Very stiff, gray, silty CLAY; moist.	CL
30			7/9/10	100	1.7	0940	30.0	Dense, brown, silty SAND and sandy SILT; moist; lenses of medium sand.	SM
35			7/12 21	100	2.0	0950	35.0	Dense, brown, slightly silty, gravelly SAND; moist.	SP-SM
40	1540 B1S8		7/15 25	100	1.4	1010	40.0	Medium dense, gray, fine to medium SAND; wet.	SP
45			0/1/10	100	1.5	1030	45.0	Very dense, gray, slightly silty, gravelly SAND; wet; 2-inch of heave when sampler pulled.	SP-SM
50			10/40 50/5"	90	1.7	1040	50.0	BOTTOM OF BORING 50 FEET Note: Bentonite/cement grout, Colorado Silica Sand - 10-20 filter pack, 2-inch I.D. PVC - 10-slot screen.	
55									



Remarks: Refer to key for explanation of terminology and symbols.

* USC soil descriptions are based on visual classification, unless otherwise noted. Contacts between soil layers are approximate and may be gradual.

LEGEND

- 2" O.D. Split-Spoon Sample
- 3" O.D. Split-Spoon Sample
- Water Level and Date Measured
- Water Level at Time of Drilling

Car Wash Enterprises - Interbay
Seattle, Washington

LOG OF BORING MW-1

June 1994 T-1540-01

Logged By	Reviewed By		
DW	KAT	SHANNON & WILSON, INC. Geotechnical and Environmental Consultants	FIG. 3

ENVLOG2 6/3/94

ENVIRONMENTAL BOREHOLE LOG

Date Started 5/2/94	Location 3435 15th Ave. West, Seattle	Depth Water First Encountered (Ft) 38.0
Date Completed 5/2/94	Drilling Company Environ. Drilling	Drilling Method Hollow-Stem Auger
Total Depth (Ft) 44.0	Sampling Method Split-spoon	Hammer: Weight (lbs) 140 Drop (In) 30
Borehole Diam. (In) 8	Ground Elev. N/A	Monument Elev. N/A PVC Elev. N/A

Depth (Ft)	Sample Number	Interval	Blow Counts/6 In	Recovery(%)	PID (ppm)	Time	Depth (Ft)	Lithologic Description	USCS* Symbol	Soil Log	Well Log	Depth (Ft)
								Ground Surface				
			6/6/5	100	1.3	1425		Medium dense, brown, slightly silty, slightly gravelly SAND; moist; (Fill).	SW-SM			2.0
5							5.0	Loose, brown-gray, slightly silty, gravelly SAND with wood; moist; petroleum-coated gravels; petroleum odor; (Fill).	SW-SM			
			2/2/5	25	1.6	1435						9.0
10							10.0	Loose, brown-gray, slightly silty, gravelly SAND with wood; moist; lenses of dark gray SAND (petroleum); red brick fragments; petroleum odor; (Fill).	SW-SM			
	1540 B2S3		3/5/5	75	27.1	1440						
15							15.0	Loose, gray, slightly silty, slightly gravelly SAND; moist; (possible Fill).	SW-SM			
			2/2/3	100	4.7	1445	18.5	Brown, silty CLAY; moist; (native material?).	CL-ML			
20							21.0	Hard, brown and gray, slightly clayey SILT; moist; mottled.	ML			21.0
	1540 B2S5		2/10 21	100	3.4	1450	23.5	Dense, gray-brown, silty, gravelly SAND, weathered rock; moist.	SM			24.0
25							26.0	Dense, gray and brown, slightly silty fine SAND; moist; banded.	SW-SM			
			7/15 25	100	0.4	1510	30.0	Dense, gray-brown, slightly silty, fine to medium SAND; moist.	SW-SM			
30												
	1540 B2S7		15/24 30	100	0.2	1515						
35							36.0	Dense, gray-brown, slightly silty, fine to medium SAND; wet.	SW-SM			
			12/24 30	100	0.0	1530						41.8
40												
			3/19 25	100	0.0	1535	43.5	Dense, gray-brown, slightly silty, fine to coarse SAND; wet.	SW-SM			44.0
45							44.0	BOTTOM OF BORING 44 FEET				
50								Note: Bentonite/cement grout, Colorado Silica Sand - 10-20 filter pack, 2-inch I.D. PVC - 10-slot screen.				

ATD 5/9/94

Remarks: Refer to key for explanation of terminology and symbols.

* USC soil descriptions are based on visual classification, unless otherwise noted. Contacts between soil layers are approximate and may be gradual.

LEGEND

- 2" O.D. Split-Spoon Sample
- 3" O.D. Split-Spoon Sample
- Water Level and Date Measured
- Water Level at Time of Drilling

Car Wash Enterprises - Interbay
Seattle, Washington

LOG OF BORING MW-2

June 1994 T-1540-01

Logged By	Reviewed By		
DW	KAT	SHANNON & WILSON, INC. Geotechnical and Environmental Consultants	FIG. 4

APPENDIX A

COPY OF ANALYTICAL RESULTS

Date of Report: May 13, 1994
Samples Submitted: May 3, 1994
Lab Traveler: 05-004
Project: T-1540

WTPH-HCID

Date Extracted: 5-3-94
Date Analyzed: 5-3-94

Matrix: Soil

Client ID	GC Characterization	o-terphenyl Surrogate Recovery
1540B1S2	<20 ppm Gasoline range hydrocarbons <50 ppm Diesel range hydrocarbons <100 ppm Oil range hydrocarbons	115%
1540B1S3	<20 ppm Gasoline range hydrocarbons <50 ppm Diesel range hydrocarbons <100 ppm Oil range hydrocarbons	114%
1540B1S8	<20 ppm Gasoline range hydrocarbons <50 ppm Diesel range hydrocarbons <100 ppm Oil range hydrocarbons	113%
1540B2S3	**Gasoline range hydrocarbons** <50 ppm Diesel range hydrocarbons **Oil range hydrocarbons**	121%
1540B2S5	<20 ppm Gasoline range hydrocarbons <50 ppm Diesel range hydrocarbons <100 ppm Oil range hydrocarbons	113%

Date of Report: May 13, 1994
Samples Submitted: May 3, 1994
Lab Traveler: 05-004
Project: T-1540

WTPH-HCID

Date Extracted: 5-3-94
Date Analyzed: 5-3-94

Matrix: Soil

Client ID	GC Characterization	o-terphenyl Surrogate Recovery
1540B2S7	<20 ppm Gasoline range hydrocarbons <50 ppm Diesel range hydrocarbons <100 ppm Oil range hydrocarbons	114%
1540SP1	<20 ppm Gasoline range hydrocarbons <50 ppm Diesel range hydrocarbons <100 ppm Oil range hydrocarbons	111%

Quality Assurance

Method Blank	<20 ppm Gasoline range hydrocarbons <50 ppm Diesel range hydrocarbons <100 ppm Oil range hydrocarbons	118%

Date of Report: May 13, 1994
Samples Submitted: May 3, 1994
Lab Traveler: 05-004
Project: T-1540

WTPH 418.1

Date Extracted: 5-6-94
Date Analyzed: 5-6-94

Matrix: Soil
Units: mg/Kg (ppm)

Client ID	Dilution Factor	Total Petroleum Hydrocarbons
1540B2S3	5	**970**

QUALITY ASSURANCE

	Dilution Factor	Total Petroleum Hydrocarbons
Method Blank	5	<25
Sample: 05-017-17	5	<25
Duplicate	5	<25
RPD		0%

Date of Report: May 13, 1994
Samples Submitted: May 3, 1994
Lab Traveler: 05-004
Project: T-1540

EPA 8020 & WTPH-G

Date Extracted: 5-5-94
Date Analyzed: 5-5-94

Matrix: Soil
Units: mg/Kg (ppm)

Client ID	1540B2S3	Method PQL
Dilution Factor	50	
Benzene	**ND**	.001
Toluene	**0.13**	.001
Ethyl Benzene	**0.47**	.001
m,p-Xylene	**0.73**	.001
o-Xylene	**0.80**	.001
TPH-Gas	**82**	.100
4-BFB Surrogate Recovery	84%	

Note: Sample PQL(practical quantitation limit)= Method PQL x dilution factor

Date of Report: May 13, 1994
Samples Submitted: May 3, 1994
Lab Traveler: 05-004
Project: T-1540

EPA 8020 & WTPH-G
QUALITY CONTROL

Date Extracted: 5-5-94
Date Analyzed: 5-5-94

Matrix: Soil
Units: mg/Kg (ppm)

Sample Number		05-008-6	05-008-6	
	Blank	**Original**	**Duplicate**	**RPD**
Dilution Factor	50	50	50	
Benzene	ND	ND	ND	NA
Toluene	ND	ND	ND	NA
Ethyl Benzene	ND	ND	ND	NA
m,p-Xylene	ND	ND	ND	NA
o-Xylene	ND	ND	ND	NA
TPH-Gas	ND	ND	ND	NA
4-BFB Surrogate Recovery	92%	85%	85%	

Date of Report: May 13, 1994
Samples Submitted: May 3, 1994
Lab Traveler: 05-004
Project: T-1540

EPA 8020 & WTPH-G
QUALITY CONTROL

Date Extracted: 5-5-94
Date Analyzed: 5-5-94

Matrix: Soil
Units: mg/Kg (ppm)

Sample Number	05-008-6		05-008-6		
spiked @ 1 ppm	**MS**	Percent	**MSD**	Percent	
Dilution Factor	50	Recovery	50	Recovery	RPD
Benzene	**0.846**	**85%**	**0.837**	**84%**	1.1
Toluene	**0.838**	**84%**	**0.829**	**83%**	1.1
Ethyl Benzene	**0.879**	**88%**	**0.868**	**87%**	1.3
m,p-Xylene	**0.842**	**84%**	**0.832**	**83%**	1.2
o-Xylene	**0.863**	**86%**	**0.897**	**90%**	3.8
4-BFB Surrogate Recovery	88%		87%		

Date of Report: May 13, 1994
Samples Submitted: May 3, 1994
Lab Traveler: 05-004
Project: T-1540

Date Analyzed: 5-5-94

RESULTS OF DRY WEIGHT

Client ID	% Moisture
1540B2S3	17

KPH

05-004

Shannon & Wilson, Inc.

400 N. 34th Street, Suite 100
Seattle, WA 98103
(206) 632-8020

11500 Olive Blvd., Suite 276
St. Louis, MO 63141
(314) 872-8170

2055 Hill Road
Fairbanks, AK 99707
(907) 479-0600

5430 Fairbanks Street, Suite 3
Anchorage, AK 99518
(907) 561-2120

Chain of Custody Record

Page 1 of 1
Laboratory on-site
Attn:

Analysis Parameters/Sample Container Description (include preservative if used)

	Sample Identity	Lab No.	Time	Date Sampled	Comp.	Grab	HCID-WTPH	418.1 Follow up as appropriate	G/BTEX	dry wt			Total Number of Containers	Remarks/Matrix
-1	1540B1S2		8:55	5/2/93			1							
-2	1540B1S3		9:00	↓			1							⊗ additional analysis requested by Brian Clark 5-4-94 JC
-3	1540B1S8		10:10	↓			1							
-4	1540B2S3		14:40	↓			1	⊗	⊗	⊗				
-5	1540B2S5		14:50	↓			1							
-6	1540B2S7		15:15	↓			1							
-7	1540SP1		12:30	5/3/94			1							

Project Information	
Project Number:	T-1540
Project Name:	Carwash Est.
Contact:	Brian Clark
Ongoing Project?	Yes ☐ No ☑
Sampler:	D. Wulf

Sample Receipt	
Total Number of Containers	7
COC Seals/Intact? Y/N/NA	
Received Good Cond./Cold	
Delivery Method: (attach shipping bill, if any)	Courier

	Relinquished By: 1.	Relinquished By: 2.	Relinquished By: 3.
Signature:	Dawn Wulf		
Time:	1430		
Printed Name:	Dawn Wulf		
Date:	5/3/94		
Company:	S&W		

	Received By: 1.	Received By: 2.	Received By: 3.
Signature:	B Wallace		
Time:	3:30 p		
Printed Name:	Bob Wallace		
Date:	5/3/94		
Company:	OSE		

Instructions

Requested Turn Around Time: Standard

Special Instructions: Verbal HCID — 633-6889 Brian Clark.

Distribution: White - w/shipment - returned to Shannon & Wilson w/ Laboratory report
Yellow - w/shipment - for consignee files
Pink - Shannon & Wilson - Job File

F-19-91/UR

OnSite Environmental Inc.

May 16, 1994
Lab Traveler #:05-024

Brian Clark
Shannon & Wilson, Inc.
400 N 34th Street, Suite 100
Seattle, WA 98103

Dear Brian:

Enclosed are the results of the analyses of samples submitted on May 9, 1994 from Project T1540-01.

We appreciate this opportunity to be of service to you on this project. If you have any questions regarding this report, please feel free to call me.

Sincerely,

Karl P. Hornyik
Project Chemist

Enclosures

14924 NE 31st Circle • Redmond, WA 98052 • (206) 883-3881 • Fax (206) 885-4603

Date of Report: May 16, 1994
Samples Submitted: May 9, 1994
Lab Traveler: 05-024
Project: T1540-01

EPA 602 & WTPH-G

Date Extracted: 5-9-94
Date Analyzed: 5-9-94

Matrix: Water
Units: ug/L (ppb)

Client ID	154030	154031	Method PQL
Dilution Factor	1	1	
Benzene	ND	ND	1.00
Toluene	ND	ND	1.00
Ethyl Benzene	ND	ND	1.00
m,p-Xylene	ND	ND	1.00
o-Xylene	ND	ND	1.00
TPH-Gas	ND	ND	300
4-BFB Surrogate Recovery	95%	96%	

Note: Sample PQL(practical quantitation limit)= Method PQL x dilution factor

Date of Report: May 16, 1994
Samples Submitted: May 9, 1994
Lab Traveler: 05-024
Project: T1540-01

EPA 602 & WTPH-G
QUALITY CONTROL

Date Extracted: 5-9-94
Date Analyzed: 5-9-94

Matrix: Water
Units: ug/L (ppb)

Sample Number	Blank	05-024-1 Original	05-024-1 Duplicate	RPD
Dilution Factor	1	1	1	
Benzene	ND	ND	ND	NA
Toluene	ND	ND	ND	NA
Ethyl Benzene	ND	ND	ND	NA
m,p-Xylene	ND	ND	ND	NA
o-Xylene	ND	ND	ND	NA
TPH-Gas	ND	ND	ND	NA
4-BFB Surrogate Recovery	88%	95%	96%	

Date of Report: May 16, 1994
Samples Submitted: May 9, 1994
Lab Traveler: 05-024
Project: T1540-01

EPA 602 & WTPH-G
QUALITY CONTROL

Date Extracted: 5-9-94
Date Analyzed: 5-9-94

Matrix: Water
Units: ug/L (ppb)

Sample Number	05-024-1		05-024-1		
spiked @ 50 ppb	**MS**	Percent	**MSD**	Percent	
Dilution Factor	1	Recovery	1	Recovery	RPD
Benzene	**46.5**	**93%**	**50.3**	**101%**	7.9
Toluene	**44.7**	**89%**	**48.2**	**96%**	7.5
Ethyl Benzene	**46.3**	**93%**	**50.1**	**100%**	7.9
m,p-Xylene	**46.0**	**92%**	**49.6**	**99%**	7.5
o-Xylene	**47.1**	**94%**	**50.7**	**101%**	7.4
4-BFB Surrogate Recovery	99%		105%		

Date of Report: May 16, 1994
Samples Submitted: May 9, 1994
Lab Traveler: 05-024
Project: T1540-01

WTPH 418.1

Date Extracted: 5-10-94
Date Analyzed: 5-11-94

Matrix: Water
Units: mg/L (ppm)

Client ID	Dilution Factor	Total Petroleum Hydrocarbons
154030	.1	**<.5**
154031	.1	**<.5**

QUALITY ASSURANCE

	Dilution Factor	Total Petroleum Hydrocarbons
Method Blank	.1	<.5

Sample duplicate data not available due to insufficient sample quantity.

05-024

Shannon & Wilson, Inc.

400 N. 34th Street, Suite 100
Seattle, WA 98103
(206) 632-8020

11500 Olive Blvd., Suite 276
St. Louis, MO 63141
(314) 872-8170

2055 Hill Road
Fairbanks, AK 99707
(907) 479-0600

5430 Fairbanks Street, Suite 3
Anchorage, AK 99518
(907) 561-2120

Chain of Custody Record

Page 1 of 1
Laboratory On Site
Attn:

KH

Analysis Parameters/Sample Container Description
(include preservative if used)

Sample Identity	Lab No.	Time	Date Sampled	Comp.	Grab	WTPHG/BTEX	WTPH-418.1					Total Number of Containers	Remarks/Matrix
154030		1330	5/9/94		X	X	X					3	H_2O
154031		1500	5/9/94		X	X	X					3	H_2O

Project Information		Sample Receipt	
Project Number: T1540-01		Total Number of Containers	6
Project Name: Interbay		COC Seals/Intact? Y/N/NA	—
Contact: B. Clark		Received Good Cond./Cold	Y
Ongoing Project? Yes ☒ No ☐		Delivery Method: (attach shipping bill, if any)	HAND
Sampler: T. FORKER			

Instructions	
Requested Turn Around Time:	Normal
Special Instructions:	

Relinquished By: 1.	Relinquished By: 2.	Relinquished By: 3.
Signature: Tolli Forker	Signature:	Signature:
Time: 1600	Time:	Time:
Printed Name: Tolli FORKER	Printed Name:	Printed Name:
Date: 5/9/94	Date:	Date:
Company: S+W	Company:	Company:

Received By: 1.	Received By: 2.	Received By: 3.
Signature: Andrew A. Ray	Signature:	Signature:
Time: 4:00pm	Time:	Time:
Printed Name: Andrew A. Ray	Printed Name:	Printed Name:
Date: 5/9/94	Date:	Date:
Company: On-Site Environmental	Company:	Company:

Distribution: White - w/shipment - returned to Shannon & Wilson w/ Laboratory report
Yellow - w/shipment - for consignee files
Pink - Shannon & Wilson - Job File

F-19-91/UR

APPENDIX B

IMPORTANT INFORMATION ABOUT YOUR ENVIRONMENTAL SITE EVALUATION/ASSESSMENT REPORT

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

Dated: June 3, 1994

To: Car Wash Enterprises
Attn: Mr. Jim Hansen

Important Information About Your Environmental Site Evaluation/Assessment Report

ENVIRONMENTAL EVALUATIONS/ASSESSMENTS ARE PERFORMED FOR SPECIFIC PURPOSES AND ENTITIES.

This report was prepared to meet the specific needs of a specific site(s). Unless indicated otherwise, we prepared your report expressly for you and for the purposes you indicated. No one other than you should apply this report for its intended purposes without first conferring with us. No party should apply this report for any purpose other than that originally contemplated without first conferring with the engineer/geoscientist.

The findings and conclusions documented in this site evaluation/assessment have been prepared for specific application to this project and have been developed in a manner consistent with that level of care and skill normally exercised by members of the environmental science profession currently practicing under similar conditions in this area. The conclusions presented are based on interpretation of information currently available to us and are made within the operational scope, budget, and schedule constraints of this project. No warranty, expressed or implied, is made.

OUR REPORT IS BASED ON PROJECT-SPECIFIC FACTORS.

Our environmental site assessment/evaluation is based on, but not limited to, several factors: reviewing public documents to chronicle site ownership for the past 30, 40, or more years; investigating the site's regulatory history to learn about permits granted or citations issued; determining prior uses of the site and those adjacent to it; reviewing available topographic and real estate maps, historic aerial photos, geologic information, and hydrologic data; reviewing readily available published information about surface and subsurface conditions; evaluating the potential for naturally occurring hazards; and interviewing public officials with respect to local concerns.

Except as noted within the text of the report, no quantitative laboratory testing was performed as part of the site assessment. Where such analyses were conducted by an outside laboratory, Shannon & Wilson relied upon the data provided and did not conduct an independent evaluation regarding the reliability of the data.

CONDITIONS CAN CHANGE.

Site conditions, both surface and subsurface, may be affected as a result of natural changes or human influence. An environmental site assessment/evaluation is based on conditions that existed at the time of the evaluation. Because so many aspects of a historical review rely on third party information, most consulting engineers will refuse to certify (warrant) that a site is free of contaminants, as it is impossible to know if such a condition exists. Contaminants may be present in areas that were not surveyed or sampled, or may migrate to areas that showed no signs of contamination when previously studied.

Unless our engineer/scientist indicates otherwise, your report should not be used when: 1) the size or configuration of the site is altered; 2) when the location of the site is modified; 3) when there is a change of ownership and/or use of the property; 4) for environmental subsurface conditions at an adjacent site; 5) for construction at an adjacent site or on site; or 6) in the event of floods, earthquakes, or other acts of God.

READ RESPONSIBILITY CLAUSES CAREFULLY.

Because environmental site assessments/evaluations are based extensively on judgment and opinion, it is far less exact than other design disciplines. This situation has resulted in wholly unwarranted claims being lodged against geotechnical/environmental consultants. To help prevent this problem, geotechnical/civil engineers and/or scientists have developed a number of clauses for use in their contracts, reports, and other documents. These responsibility clauses are not exculpatory clauses designed to transfer the engineer's or scientist's liabilities to other parties; rather, they are definitive clauses that identify where responsibilities begin and end. Their use helps all parties involved recognize their individual responsibilities and take appropriate action. Some of these definitive clauses may appear in this report, and you are encouraged to read them closely. Your engineer/scientist will be pleased to give full and frank answers to your questions.

Consulting engineers/scientists cannot accept responsibility for problems that may develop if they are not consulted after factors considered in their reports have changed. Therefore, it is incumbent upon you to notify your engineer/scientist of any factors that may have changed prior to submission of our final assessment/evaluation.

An assessment/evaluation of a site helps reduce your risk, but does not eliminate it. Even the most rigorous professional assessment may fail to identify all existing conditions.

ONE OF THE OBLIGATIONS OF YOUR CONSULTING ENGINEER/SCIENTIST IS TO PROTECT THE SAFETY, HEALTH, PROPERTY, AND WELFARE OF THE PUBLIC.

If our environmental site assessment/evaluation discloses the existence of conditions that may endanger the safety, health, property, or welfare of the public, we may be obligated (under rules of professional conduct, statutory law, or common law) to notify you and others of these conditions.

APPENDIX D

ANALYTICAL RESULTS FROM EXCAVATION AT BROWN BEAR CAR WASH--INTERBAY SHANNON & WILSON, INC. SEPTEMBER 28, 1994

SHANNON & WILSON, INC.
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

SEATTLE
HANFORD
FAIRBANKS
ANCHORAGE
SAINT LOUIS
BOSTON

1954 1994

September 28, 1994

Car Wash Enterprises
3977 Leary Way N.W.
P.O. Box 70527
Seattle, Washington 98107-0527

Attn: Mr. Jim Hansen

RE: ANALYTICAL RESULTS FROM EXCAVATION AT BROWN BEAR CAR WASH - INTERBAY, SEATTLE, WASHINGTON

INTRODUCTION

This letter provides analytical results from samples collected from the excavation at the Interbay Brown Bear Car Wash located at 3435 15th Avenue West, Seattle, Washington (Figure 1). The purpose of this sampling was to evaluate the extent of petroleum contamination at the north end of the property and to determine specific excavation requirements. This work was authorized by Mr. Jim Hansen of Car Wash Enterprises on August 26, 1994.

BACKGROUND

An unknown number of underground storage tanks were removed from the site in 1986. In 1990, three additional underground storage tanks and approximately 1,300 cubic yards of soil were removed by Brown Bear Car Wash from the central portion of the site. Sidewall and bottom samples collected from the excavation at that time contained petroleum hydrocarbons below cleanup levels.

In May 1994, Shannon & Wilson installed two monitoring wells, MW-1 and MW-2, at the site (Figure 2). No groundwater contamination was detected; however, petroleum contamination was detected in a single soil sample from MW-2 at 12.5 feet. The contamination consisted of 970 parts per million (ppm) heavy-end hydrocarbons

400 NORTH 34TH STREET • SUITE 100
P.O. BOX 300303
SEATTLE, WASHINGTON 98103
206 • 632 • 8020 FAX 206 • 633 • 6777

(WTPH-418.1) and 82 ppm gasoline (WTPH-G). Low concentrations of toluene, ethylbenzene, and xylenes were also detected. The sample was fill material consisting of slightly silty, gravelly sand with wood, lenses of dark gray sand (petroleum), and red brick fragments. In addition, petroleum-coated gravel was observed in samples collected from 5 to 10 feet.

FIELD ACTIVITIES AND ANALYTICAL RESULTS

An initial narrow trench to determine the southern extent of the petroleum contamination was performed on August 29, 1994. Two distinct types of fill were present in the excavation. The first fill consisted of lenses of gravelly sand, wood debris, brick fragments, along with other debris. The second fill consisted of gravelly sand. Car Wash Enterprises personnel identified the former of these fills as the original site fill, and the latter as the soil used to backfill the 1990 tank removal excavation. Sample number 10 was collected from the original site fill at a depth of 12 feet, and Sample 11 was collected from the 1990 backfill at a depth of 6 feet, at the approximate locations shown on Figure 2. Neither sample contained petroleum hydrocarbons. Analytical results are presented in Table 1.

Additional excavation to remove the petroleum contamination detected in MW-2 was performed on August 31, 1994. The soils in the excavation were similar to the original site fill described above. A soil sample was collected from the north side (19), the south side (20), and the east side (21) of the excavation at the approximate locations shown on Figure 2. Petroleum hydrocarbons were not detected in the sample from the north side. A highly weathered gasoline was detected in samples from the south and east sides of the excavation. Sample number 20 from the south side contained 390 ppm WTPH-G, and sample number 21 from the east side of the excavation contained 40 ppm WTPH-G. Low concentrations of toluene, ethylbenzene, and xylenes were also detected in the samples. The analytical results are presented in Table 1.

CONCLUSION

Although heavy-end hydrocarbons were detected in one soil sample from MW-2, they were not detected in subsequent soil samples from the excavation area. However, a weathered gasoline was detected on the southeast side of the 1994 excavation at 390 ppm, in excess of the 100 ppm Model Toxics Control Act Method A cleanup level. Groundwater contamination was not detected.

The detection of petroleum contamination is inconsistent and could be a result of small, unrelated historic releases. Therefore, an accurate definition of the extent of remaining contamination within the old site grading fill is difficult. The excavation of additional soils in MW-2 and the recent excavation is approaching a practicable limit due to the proximity to 15th Avenue West. Because of the apparent limited extent of remaining soil contamination, the proximity of the excavation to 15th Avenue West, and the lack of impact to groundwater; additional cleanup does not appear to be warranted. Shannon & Wilson recommends discussing the site conditions with the Washington State Department of Ecology in anticipation of a no further action status for the site.

The data presented in this report are based on limited research at the facility and should be considered representative at the time of our observations. Shannon & Wilson, Inc. performed this work within our best judgment to adequately describe site conditions at the facility. Changes in the conditions of the property can occur with time from both natural processes and human activities. In addition, changes in governmental codes, regulations, or law may occur. Due to such changes, our observations and recommendations applicable to this facility may need to be revised wholly or in part, due to changes beyond our control.

This report was prepared for the exclusive use of Car Wash Enterprises and in no way guarantees that an agency or its staff will reach the same conclusions as Shannon & Wilson, Inc. Shannon & Wilson has prepared the attached "Important Information About Your Environmental Site Evaluation" to assist you and others in understanding the use and limitations of our reports.

If you have any questions regarding this letter, please call us at (206) 632-8020.

Respectfully,

SHANNON & WILSON, INC.

Dawn Wulf
Hydrogeologist

Brian L. Clark
Environmental Engineer

DW:BLC:JWZ/dw

Enclosures: Table 1 - Analytical Results
Figure 1- Vicinity Map
Figure 2 - Site and Exploration Plan
Laboratory Data Sheets
Important Information About Your Environmental Site Evaluation/ Assessment Report

T-1540-02

TABLE 1
ANALYTICAL RESULTS

Depth	Sample #	GC Characterization	WTPH-HCID	WTPH-G	Benzene	Toluene	Ethylbenzene	Total Xylenes
	Initial Excavation							
12'	1540-12-10	ND	NA	NA	NA	NA	NA	NA
6'	1540-06-11	NA	ND	<1	<.02	<.02	<.02	<.06
	Final Excavation							
	1540-12-19	NA	NA	ND	ND	ND	ND	ND
	1540-14-20	NA	NA	390	<.02	0.13	1.6	2.3
	1540-09-21	NA	NA	40	<.02	<.02	0.06	0.13
	MTCA Method A Soil Cleanup Levels	NA	NA	100	0.5	40	20	20

Notes: All results in parts per million
Samples analyzed at Friedman & Bruya, Inc. in Seattle, Washington.
Lab reports dated September 2, 8, and 9th, 1994.
NA = Not Analyzed
ND = Not Detected at detetection limit

NOTE

Map adapted from USGS topographic map of Seattle North, WA quadrangle, dated 1983.

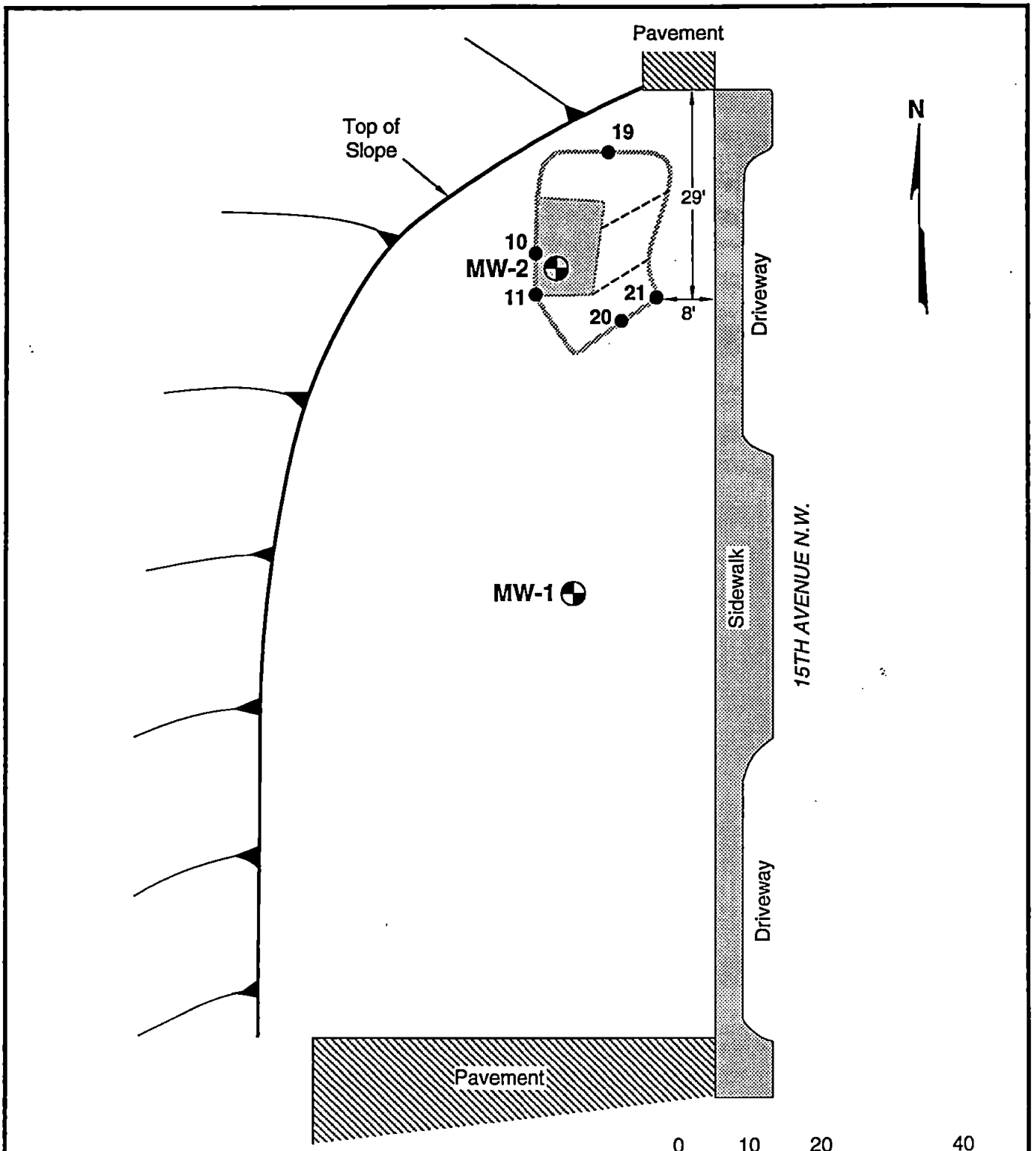
Car Wash Enterprises - Interbay
Seattle, Washington

VICINITY MAP

September 1994 T-1540-03

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

FIG. 1



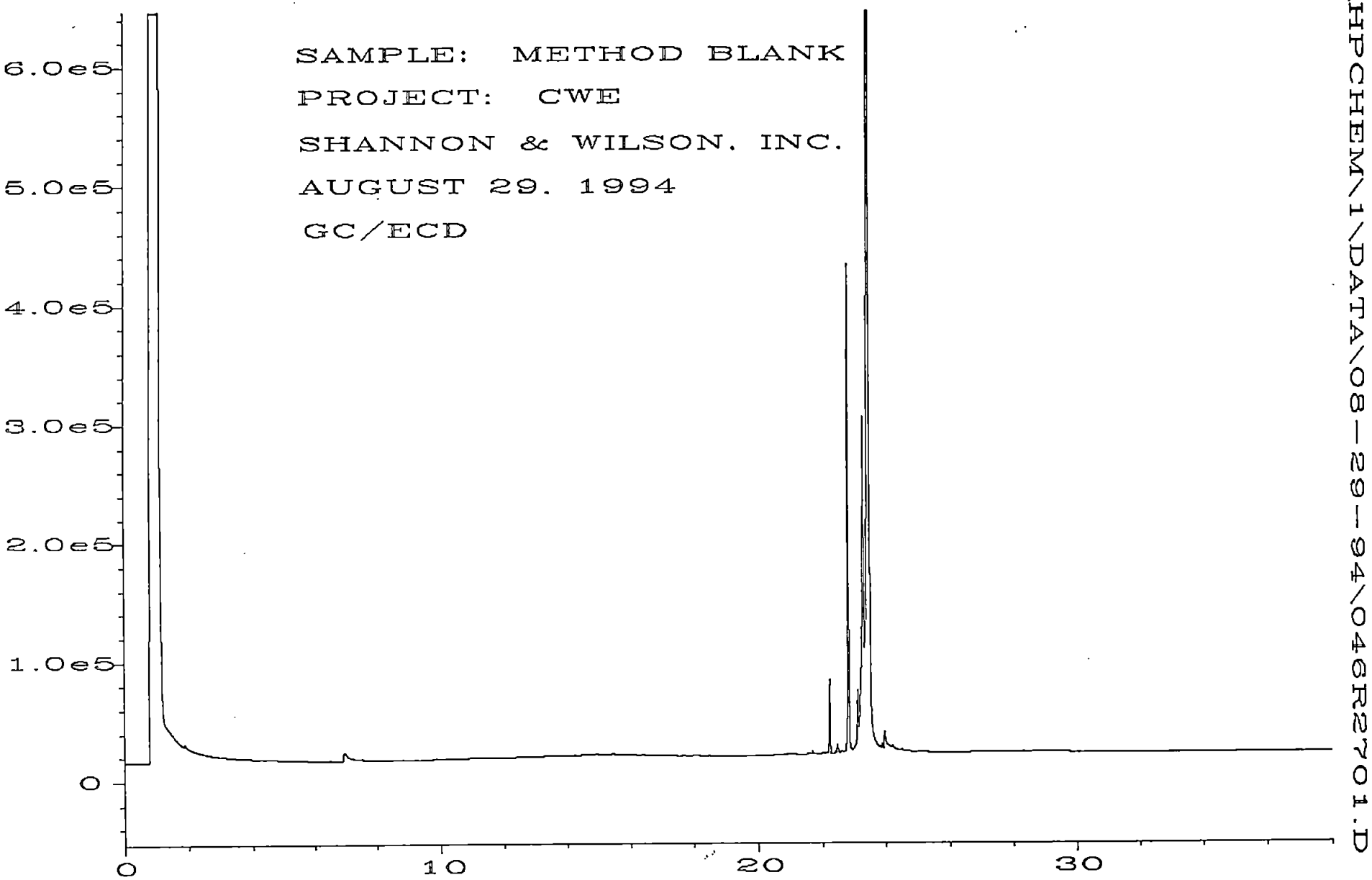
Car Wash Enterprises - Interbay
Seattle, Washington

SITE AND EXPLORATION PLAN

September 1994 T-1540-02

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

FIG. 2


SAMPLE: METHOD BLANK
PROJECT: CWE
SHANNON & WILSON. INC.
AUGUST 29. 1994
GC/ECD
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5.0e5
4.0e5
3.0e5
2.0e5
1.0e5
0
0
10
20
30
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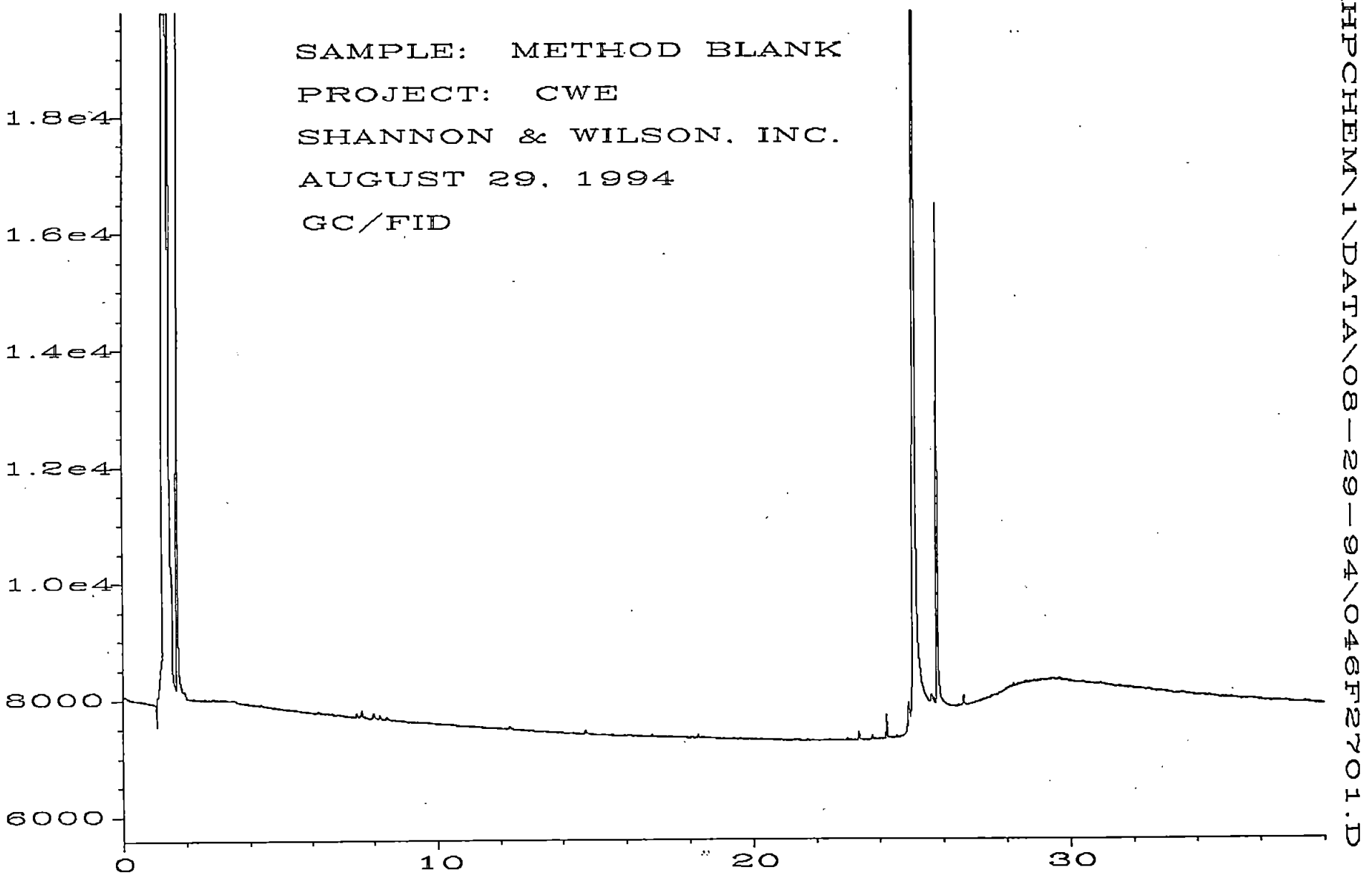
SAMPLE: METHOD BLANK
PROJECT: CWE
SHANNON & WILSON, INC.
AUGUST 29, 1994
GC/FID
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1.6e4
1.4e4
1.2e4
1.0e4
8000
6000
0
10
20
30
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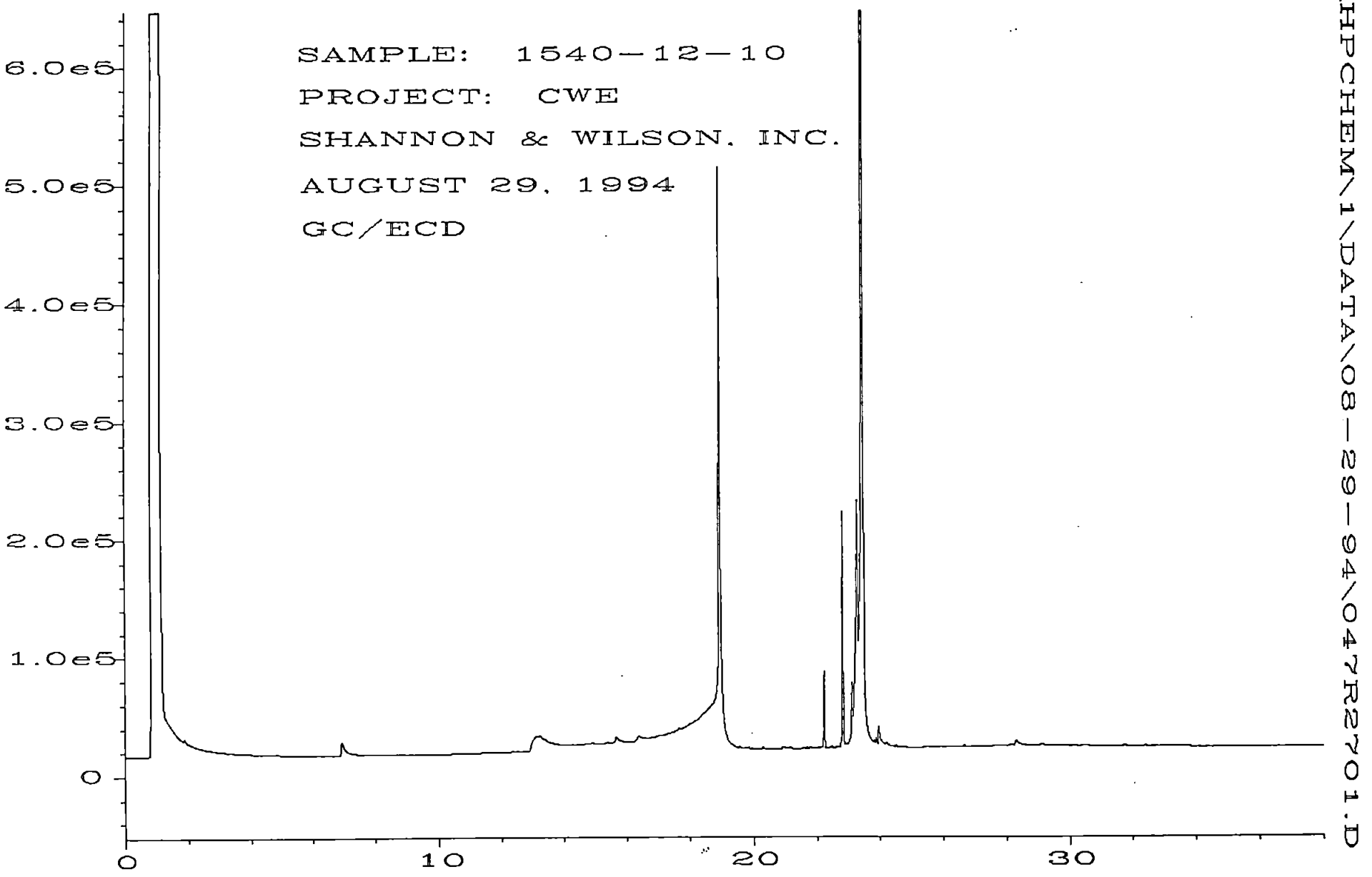
SAMPLE: 1540-12-10
PROJECT: CWE
SHANNON & WILSON, INC.
AUGUST 29, 1994
GC/ECD
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5.0e5
4.0e5
3.0e5
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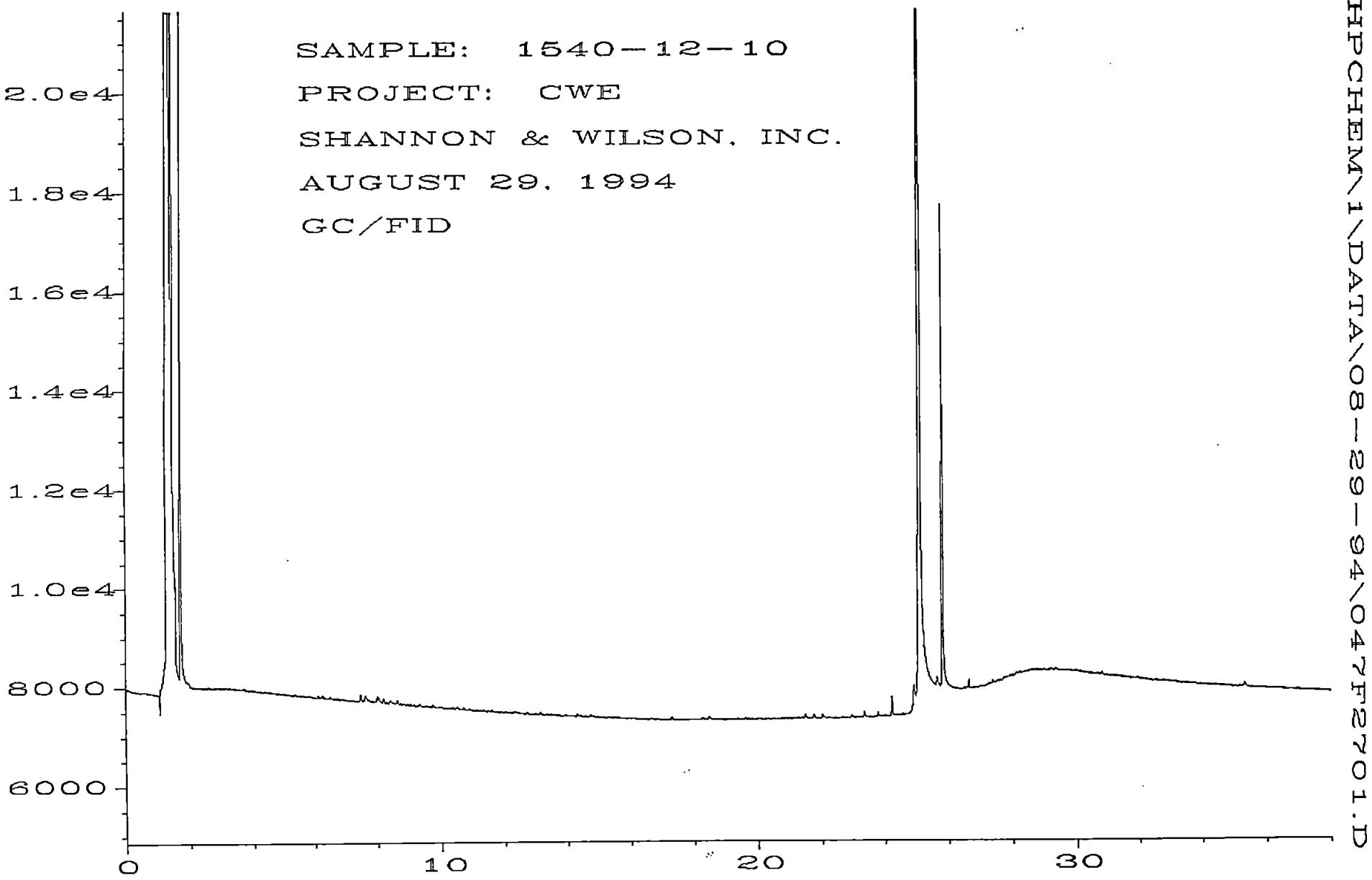
SAMPLE: 1540-12-10
PROJECT: CWE
SHANNON & WILSON, INC.
AUGUST 29, 1994
GC/FID
2.0e4
1.8e4
1.6e4
1.4e4
1.2e4
1.0e4
8000
6000
0
10
20
30
C:\HPCHEM\1\DATA\08-29-94\047F2701.D

08/29/94

Shannon & Wilson, Inc.

400 N. 34th Street, Suite 100
Seattle, WA 98103
(206) 632-8020

11500 Olive Blvd., Suite 276
St. Louis, MO 63141
(314) 872-8170

2055 Hill Road
Fairbanks, AK 99707
(907) 479-0600

5430 Fairbanks Street, Suite 3
Anchorage, AK 99518
(907) 561-2120
Fax (907) 561-4483

Chain of Custody Record

Page 1 of 1
Laboratory FBT 4:20
Attn:

Analysis Parameters/Sample Container Description
(include preservative if used)

Sample Identity	Lab No.	Time	Date Sampled	Comp.	Grab	Characterization by GAS CHROMOTOGRAPHY	WTPH-G/BTEX	WTPH-D						Total Number of Containers	Remarks/Matrix
1540-12-10	52356	1320	8/29/94		X	X								1 8oz	SOIL
1540-06-11	52357	1325				~~X~~	X	per DW phone 8/30/94 Todd						8oz	
154012	52358	1500					X	H						4oz	
154013	52359						X	H							
154014	52360						X	H							
154015	52361						X	H							
154016	52362						X	H							
154017	52363						X	H							
154018	52364						X	H							

Project Information	Sample Receipt	
Project Number: T1540-02	Total Number of Containers	9
Project Name: CWE	COC Seals/Intact Y/N/NA	—
Contact: D. WULF/B. CLARK	Received Good Cond./Cold	—
Ongoing Project? Yes [X] No [ ]	Delivery Method: HAND	
Sampler: T. FORKER	(attached shipping bill, if any)	

Instructions

Requested Turn Around Time: 24 hours on #10 & #11
2 week on 12→18

Special Instructions: extend G so that if there appears to be D. then Run D. call Brian Clark w/?

Relinquished By: 1.	Relinquished By: 2.	Relinquished By: 3.
Signature: [signature] Time: 1600	Signature: Time:	Signature: Time:
Printed Name: Tolli FORKER Date: 8/29/94	Printed Name: Date:	Printed Name: Date:
Company: S+W	Company:	Company:

Received By: 1.	Received By: 2.	Received By: 3.
Signature: Kathy Miller Time: 4:00	Signature: Time:	Signature: Time:
Printed Name: Kathy Miller Date: 8/29/94	Printed Name: Date:	Printed Name: Date:
Company: FBL	Company:	Company:

Distribution White - w/ shipment - returned to Shannon & Wilson w/ laboratory report
Yellow - w/ shipment - for consignee files
Pink - Shannon & Wilson - job file

F-19-91/UR-r9/92

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Andrew John Friedman
James E. Bruya, Ph.D.
(206) 285-8282

3012 16th Avenue West
Seattle, WA 98119-2029
FAX: (206) 283-5044

September 9, 1994

Dawn Wulf, Project Leader
Shannon & Wilson, Inc.
P.O. Box C-30313
Seattle, WA 98103

Dear Ms. Wulf:

Enclosed are the results from the additional testing of material submitted on August 31, 1994 from Project T1540-02, CWE.

We appreciate this opportunity to be of service to you and hope you will call if you should have any questions.

Sincerely,

Todd R. Crawford
Chemist

TRC/sao

Enclosures

FAX: (206) 633-6777

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: September 9, 1994
Date Received: August 31, 1994
Project: T1540-02, CWE
Date Samples Extracted: September 6, 1994
Date Extracts Analyzed: September 8, 1994

RESULTS FROM THE ANALYSIS OF SOIL SAMPLES FOR BENZENE, TOLUENE, ETHYLBENZENE, XYLENES AND GASOLINE USING EPA METHODS 8020 AND 8015 per Washington DOE Guidelines

Results Reported as µg/g (ppm)

Sample ID	Benzene	Toluene	Ethyl-benzene	Total Xylenes	Gasoline	Surrogate Standard % Recovery
1540-14-20	<0.02	0.13	1.6	2.3	390	137%
1540-09-21	<0.02	<0.02	0.06	0.13	40	102%
Quality Assurance						
Blank	<0.02	<0.02	<0.02	<0.06	<1	89%
1540-09-21 (Duplicate)	<0.02	<0.02	0.08	0.14	39	101%
1540-09-21 (Matrix Spike) % Recovery	70%	78%	80%	83%	na	100%
1540-09-21 (Matrix Spike Duplicate) % Recovery	69%	77%	92%	93%	na	103%
Spike Blank % Recovery	61%	69%	72%	72%	72%	93%
Spike Level	1	1	1	3	10	

[na] The analyte indicated was not added to the matrix spike sample.

08[redacted] BU
TRC
08/31/94
3:2[illegible]

Shannon & Wilson, Inc.

Chain of Custody Record

Page 1 of 1
Laboratory FBI
Attn:

400 N. 34th Street, Suite 100
Seattle, WA 98103
(206) 632-8020

11500 Olive Blvd., Suite 276
St. Louis, MO 63141
(314) 872-8170

2055 Hill Road
Fairbanks, AK 99707
(907) 479-0600

5430 Fairbanks Street, Suite 3
Anchorage, AK 99518
(907) 561-2120
Fax (907) 561-4483

Analysis Parameters/Sample Container Description
(include preservative if used)

Sample Identity	Lab No.	Time	Date Sampled	Comp.	Grab	WTPH-HCID	WTPH-G/BTEX	WTPH-D	WTPH-418.1				Total Number of Containers	Remarks/Matrix
1540-12-19	52401	1200	8/31/94		X	X	H	H	H				1	SOIL
1540-14-20	52402	1350	"		X	X	"	"	"				"	"
1540-09-21	52403	1355	"		X	X	"	"	"				"	"
154022	52404	1445	"		X		"	"	"				"	"
154023	52405	1445	"		X		"	"	"				"	"

Project Information		Sample Receipt	
Project Number: T1540-02		Total Number of Containers	5
Project Name: CWE		COC Seals/Intact Y/N/NA	—
Contact: D. WULF		Received Good Cond./Cold	Y
Ongoing Project? Yes ☒ No ☐		Delivery Method: (attached shipping bill, if any)	HAND
Sampler: T. FORKER			

Instructions

Requested Turn Around Time: 24 Hour on #19-21, 3 days #22-23

Special Instructions: Hold on "H" pending results of HCID. Only run what is found by HCID

Relinquished By: 1.	Relinquished By: 2.	Relinquished By: 3.
Signature: Tolli Forker Time: 1515	Signature: Time:	Signature: Time:
Printed Name: TOLLI FORKER Date: 8/31/94	Printed Name: Date:	Printed Name: Date:
Company: S+W	Company:	Company:

Received By: 1.	Received By: 2.	Received By: 3.
Signature: Kathy Miller Time: 3:15	Signature: Time:	Signature: Time:
Printed Name: Kathy Miller Date: 8/31	Printed Name: Date:	Printed Name: Date:
Company: FBI	Company:	Company:

Distribution: White - w/ shipment - returned to Shannon & Wilson w/ laboratory report
Yellow - w/ shipment - for consignee files
Pink - Shannon & Wilson - job file

F-19-91/UR-r9/92

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Andrew John Friedman
James E. Bruya, Ph.D.
(206) 285-8282

3012 16th Avenue West
Seattle, WA 98119-2029
FAX: (206) 283-5044

September 8, 1994

Dawn Wulf, Project Leader
Shannon & Wilson, Inc.
P.O. Box C-30313
Seattle, WA 98103

Dear Ms. Wulf:

Enclosed are the results from the testing of material submitted on August 31, 1994 from Project T1540-02, CWE.

We appreciate this opportunity to be of service to you and hope you will call if you should have any questions.

Sincerely,

Todd Crawford

Todd R. Crawford
Chemist

TRC/sao

Enclosures

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: September 8, 1994
Date Received: August 31, 1994
Project: T1540-02, CWE
Date Samples Extracted: September 1, 1994

RESULTS FROM THE ANALYSIS OF SOIL SAMPLES FOR FINGERPRINT CHARACTERIZATION BY CAPILLARY GAS CHROMATOGRAPHY USING A FLAME IONIZATION DETECTOR (FID) AND ELECTRON CAPTURE DETECTOR (ECD)

Sample ID	GC Characterization
1540-12-19	The GC trace using the flame ionization detector (FID) and the GC electron capture detector (ECD) trace showed an absence of volatile and semi-volatile compounds. The detection limit for this analysis is 20, 50 and 100 ppm for gasoline, diesel and motor oil, respectively. The large peak seen near 25 minutes on the GC/FID trace is pentacosane, added as a quality assurance check for this GC analysis. The large peak seen near 24 minutes on the GC/ECD trace is dibutyl chlorendate, also added as a quality assurance check for this GC analysis.
1540-14-20	The GC trace using the flame ionization detector (FID) showed the presence of low boiling compounds. The patterns displayed by these peaks are indicative of highly weathered gasoline or turpentine. The low boiling compounds appeared as a ragged pattern of peaks eluting from n-C_6 to n-C_{14} showing a maximum near n-C_8. If the low boiling product is gasoline then it appears to have undergone degradation by water solubilization processes due to the selective loss of benzene, toluene, ethylbenzene and the xylenes. The large peak seen near 25 minutes on the GC/FID trace is pentacosane, added as a quality assurance check for this GC analysis. The large peak seen near 24 minutes on the GC/ECD trace is dibutyl chlorendate, also added as a quality assurance check for this GC analysis.

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: September 8, 1994
Date Received: August 31, 1994
Project: T1540-02, CWE
Date Samples Extracted: September 1, 1994

RESULTS FROM THE ANALYSIS OF SOIL SAMPLES FOR FINGERPRINT CHARACTERIZATION BY CAPILLARY GAS CHROMATOGRAPHY USING A FLAME IONIZATION DETECTOR (FID) AND ELECTRON CAPTURE DETECTOR (ECD)

Sample ID	GC Characterization
1540-09-21	The GC trace using the flame ionization detector (FID) showed the presence of low boiling compounds at a level too low to characterize. The low boiling compounds appeared as a ragged pattern of peaks eluting from n-C_6 to n-C_{14} showing a maximum near n-C_{12}. The large peak seen near 25 minutes on the GC/FID trace is pentacosane, added as a quality assurance check for this GC analysis. The large peak seen near 24 minutes on the GC/ECD trace is dibutyl chlorendate, also added as a quality assurance check for this GC analysis.

TKC 08/31/94

Chain of Custody Record

Shannon & Wilson, Inc.

400 N. 34th Street, Suite 100
Seattle, WA 98103
(206) 632-8020

11500 Olive Blvd., Suite 276
St. Louis, MO 63141
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2055 Hill Road
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(907) 479-0600

5430 Fairbanks Street, Suite 3
Anchorage, AK 99518
(907) 561-2120
Fax (907) 561-4483

Page 1 of 1
Laboratory FBF
Attn:

Analysis Parameters/Sample Container Description
(include preservative if used)

Sample Identity	Lab No.	Time	Date Sampled	Comp.	Grab	WTPH-HCID	WTPH-G/BTEX	WTPH-D	WTPH-418.1				Total Number of Containers	Remarks/Matrix
1540-12-19	52401	1200	8/31/94		X	X	H	H	H				1	SOIL
1540-14-20	52402	1350	"		X	X	"	"	"				"	
1540-09-21	52403	1355	"		X	X	"	"	"				"	
154022	52404	1445	"		X		"	"	"				"	
154023	52405	1445	"		X		"	"	"				"	

Project Information	
Project Number: 1540-02	
Project Name: CWE	
Contact: DWILF	
Ongoing Project? Yes ☒ No ☐	
Sampler: T. FORKER	

Sample Receipt	
Total Number of Containers	5
COC Seals/Intact Y/N/NA	—
Received Good Cond./Cold	Y
Delivery Method: (attached shipping bill, if any)	HAND

Instructions

Requested Turn Around Time: 24 Hour on #19-21, 3 days on #22 & #23

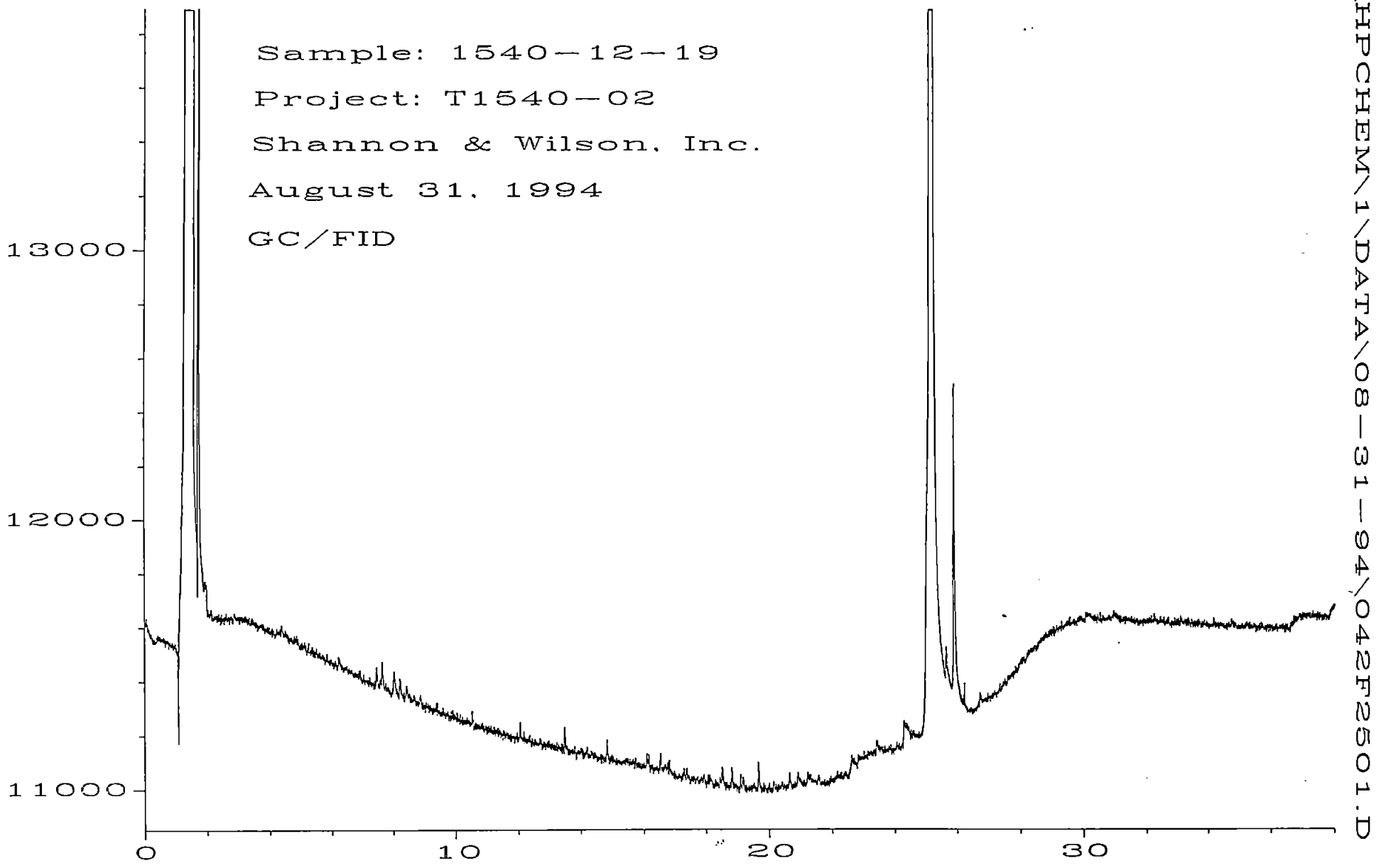
Special Instructions: Hold on "H" pending results of HCID. Only run what is found by HCID

Relinquished By: 1.	Relinquished By: 2.	Relinquished By: 3.
Signature: Tolli Forker Time: 1515	Signature: Time:	Signature: Time:
Printed Name: TOLLI FORKER Date: 8/31/94	Printed Name: Date:	Printed Name: Date:
Company: S+W	Company:	Company:

Received By: 1.	Received By: 2.	Received By: 3.
Signature: Kathy Miller Time: 3:15	Signature: Time:	Signature: Time:
Printed Name: Kathy Miller Date: 8/31	Printed Name: Date:	Printed Name: Date:
Company: FBF	Company:	Company:

Distribution: White - w/ shipment - returned to Shannon & Wilson w/ laboratory report
Yellow - w/ shipment - for consignee files
Pink - Shannon & Wilson - job file

F-19-91/UR-r9/92


Sample: 1540-12-19
Project: T1540-02
Shannon & Wilson, Inc.
August 31, 1994
GC/FID
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12000
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10
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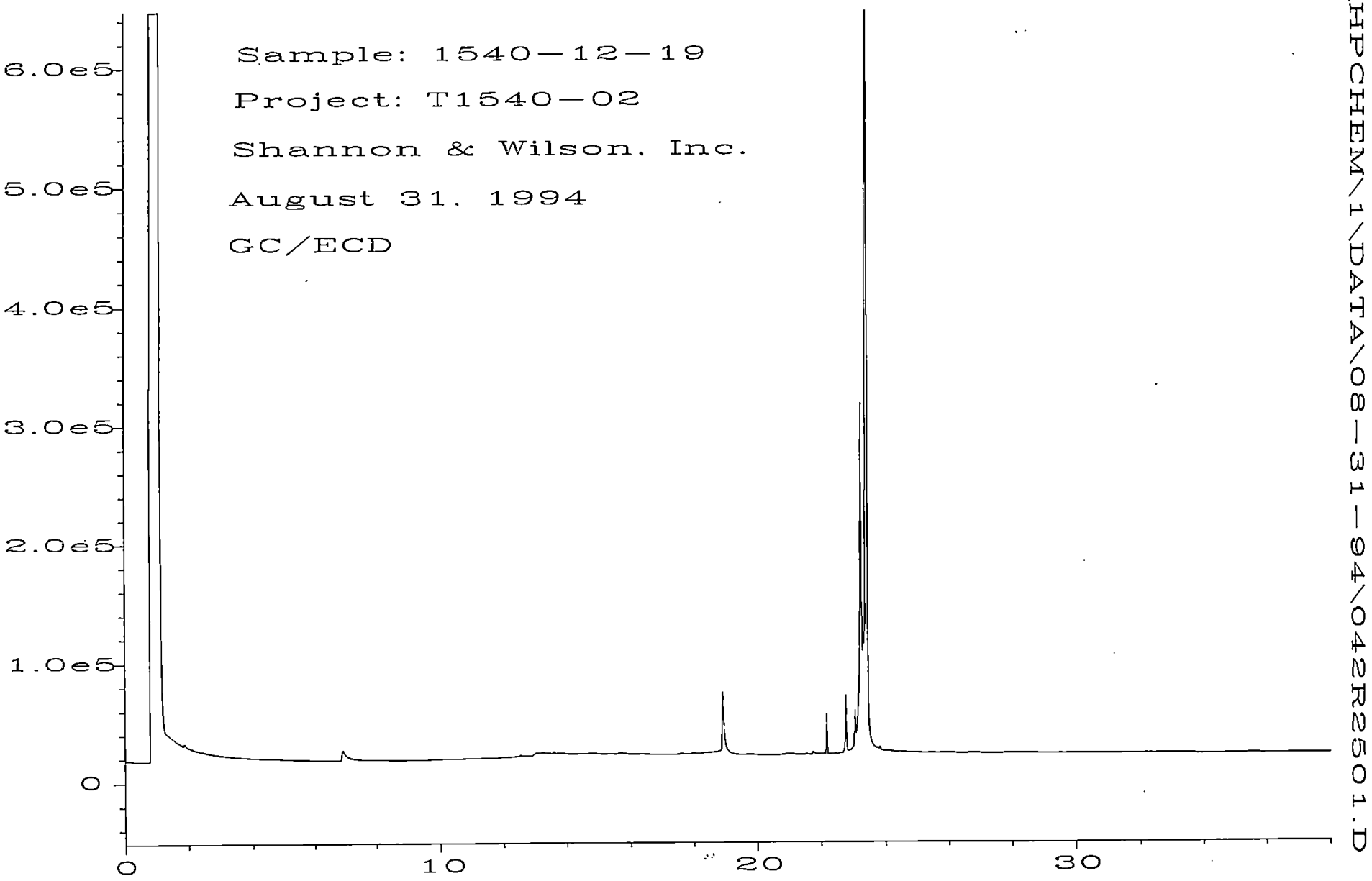
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Project: T1540-02
Shannon & Wilson, Inc.
August 31, 1994
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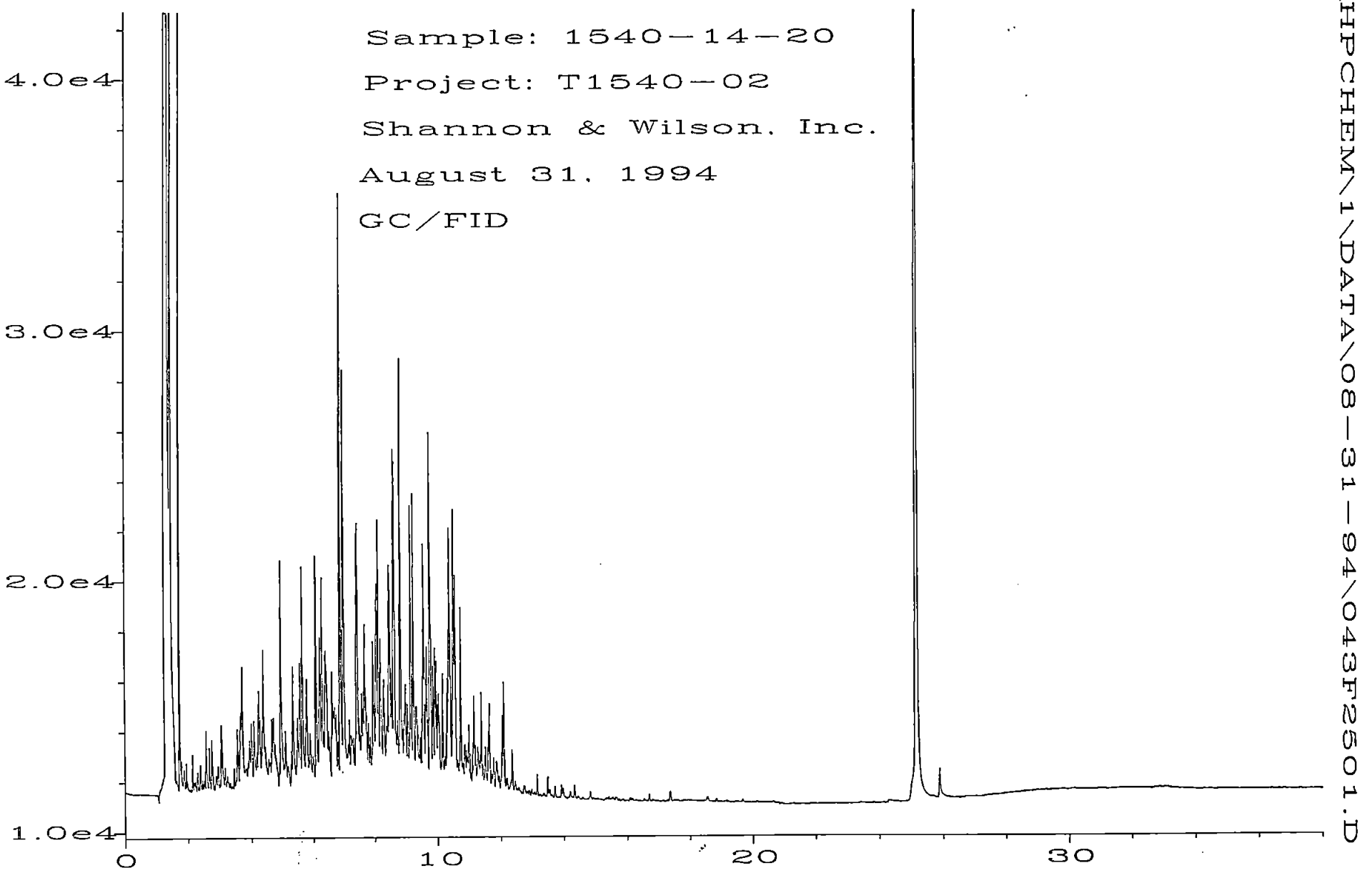
Sample: 1540-14-20
Project: T1540-02
Shannon & Wilson, Inc.
August 31, 1994
GC/FID
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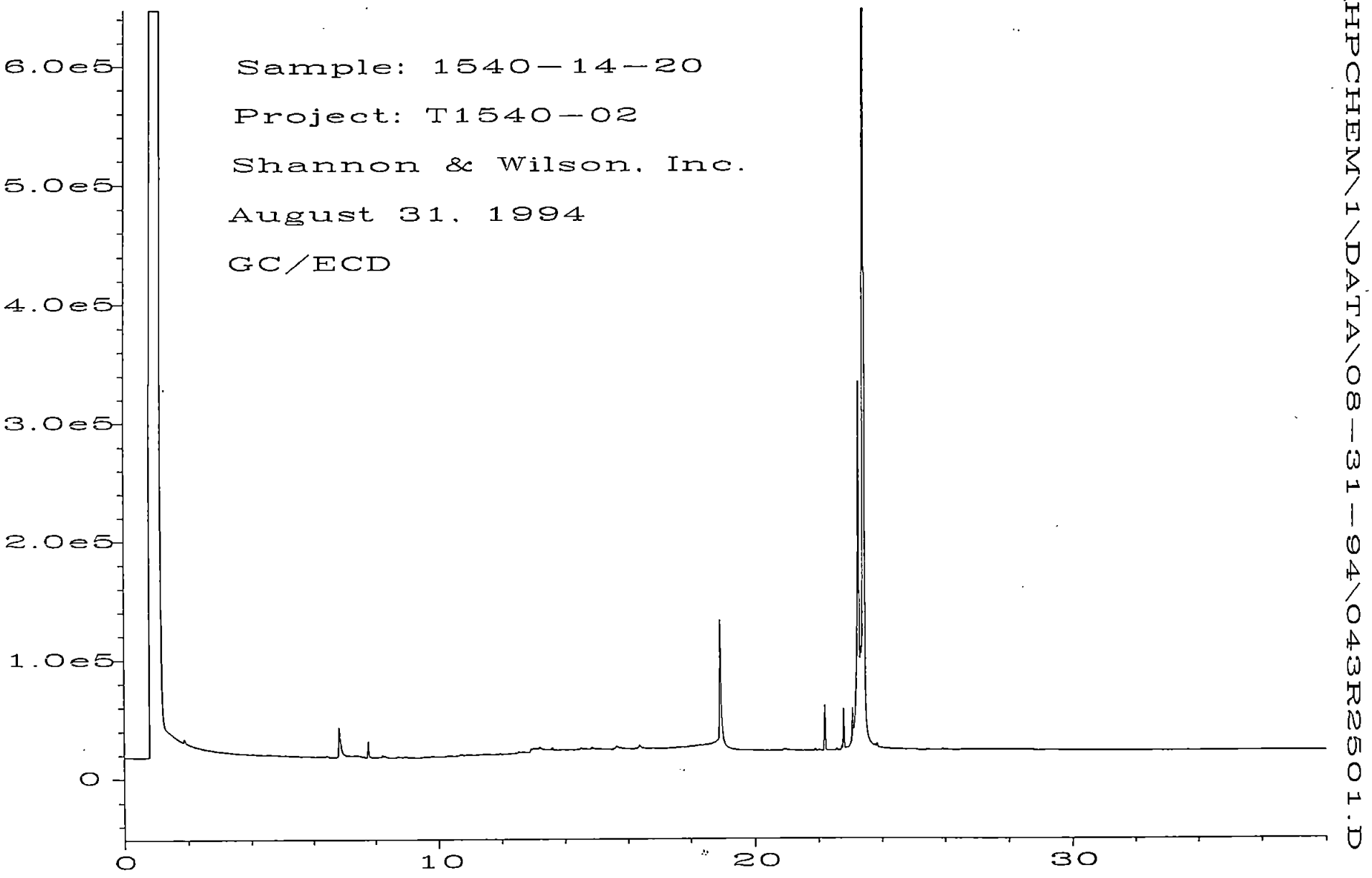
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Project: T1540-02
Shannon & Wilson, Inc.
August 31, 1994
GC/ECD
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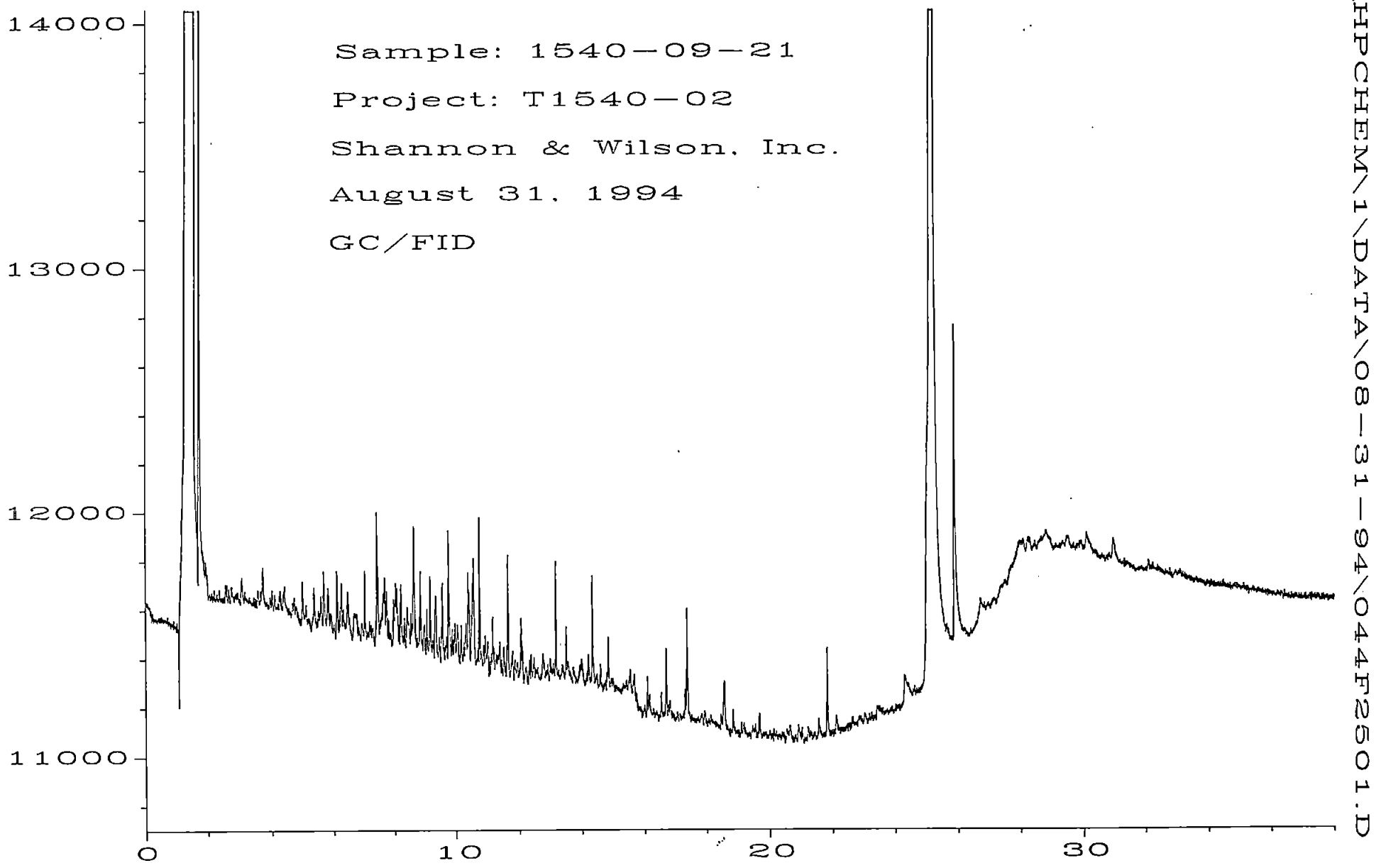
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Project: T1540-02
Shannon & Wilson, Inc.
August 31, 1994
GC/FID
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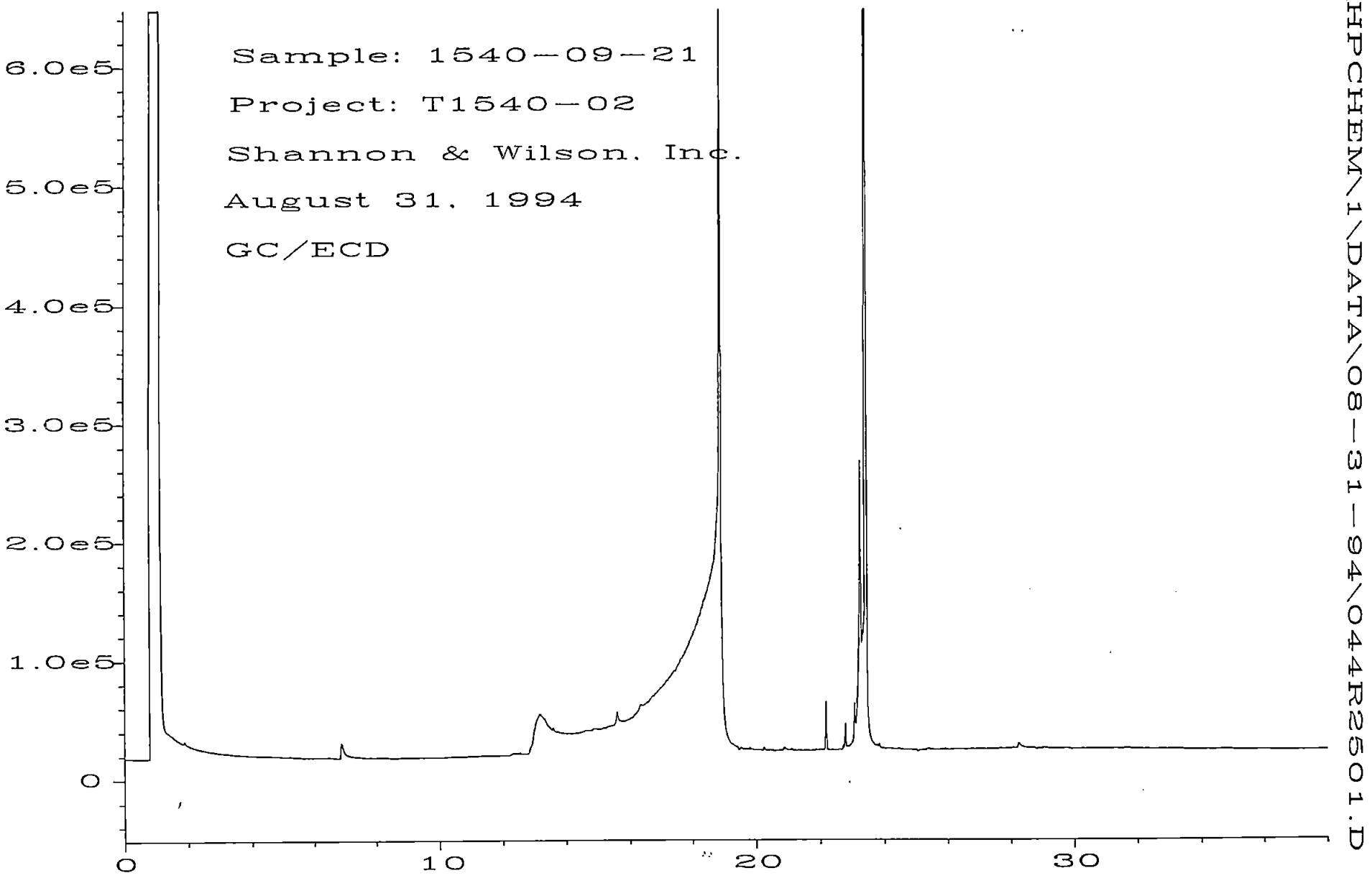
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Project: T1540-02
Shannon & Wilson, Inc.
August 31, 1994
GC/ECD
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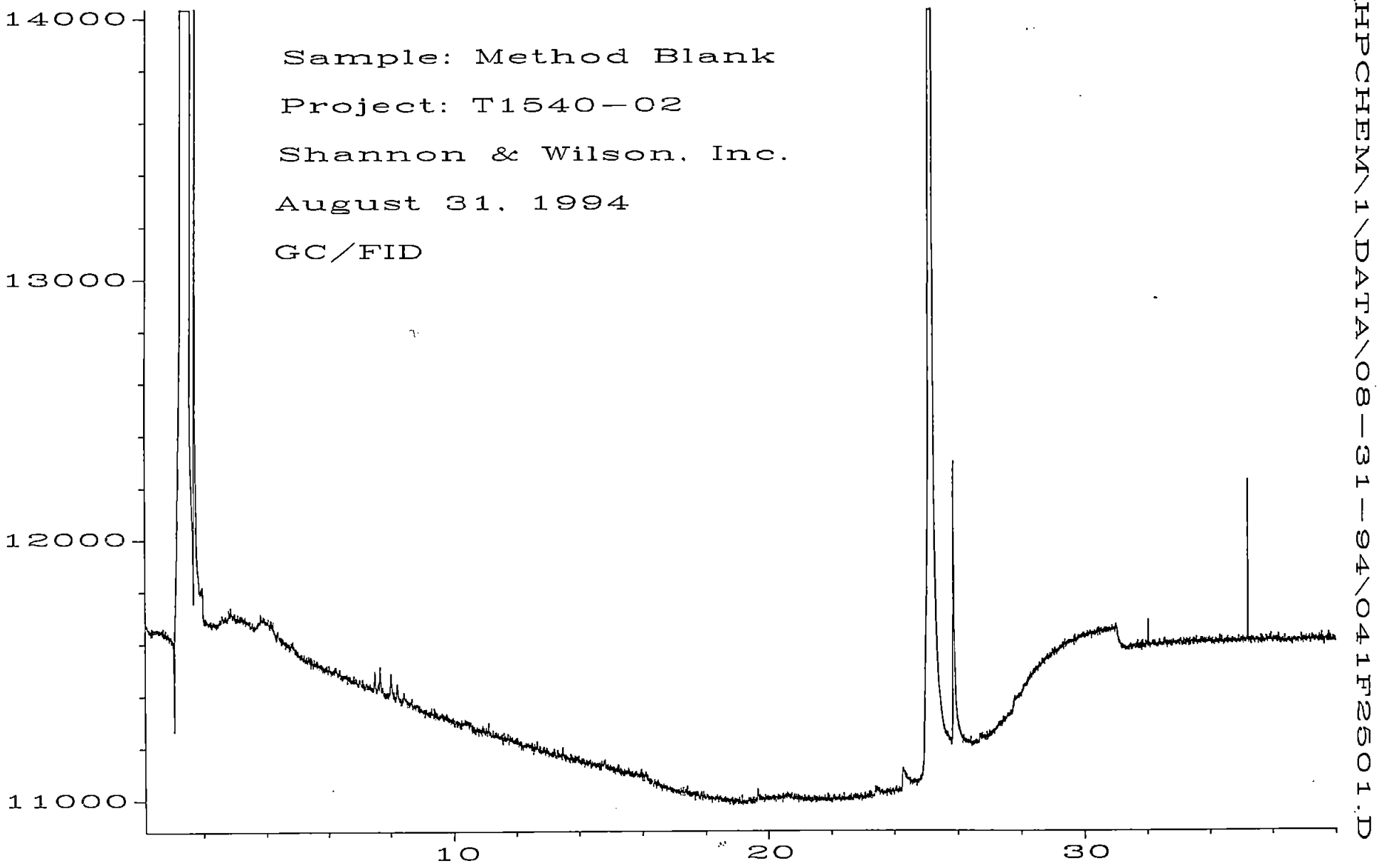
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Project: T1540-02
Shannon & Wilson, Inc.
August 31, 1994
GC/FID
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13000
12000
11000
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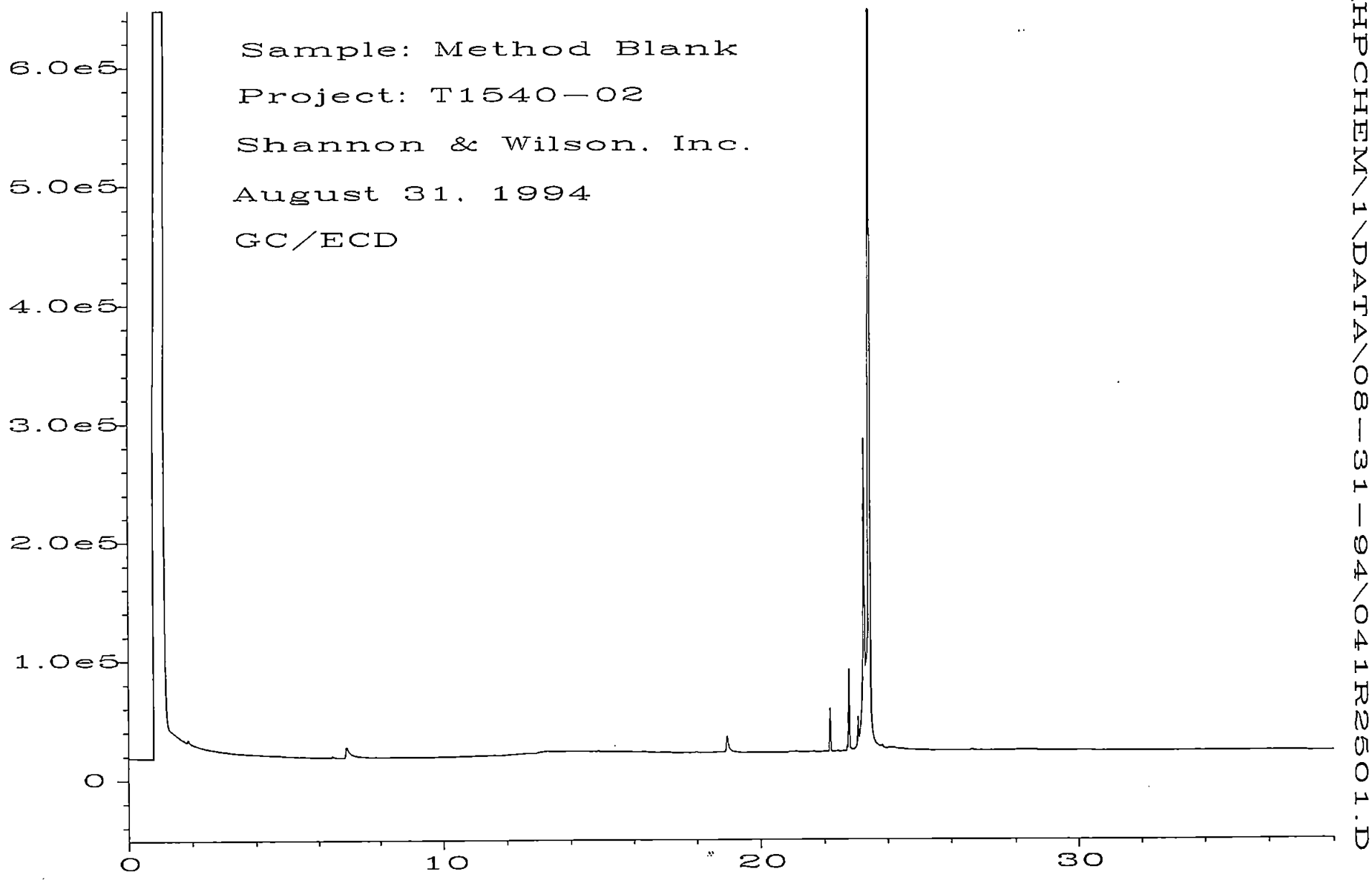
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Project: T1540-02
Shannon & Wilson. Inc.
August 31. 1994
GC/ECD
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4.0e5
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2.0e5
1.0e5
0
0
10
20
30
C:\HPCHEM\1\DATA\08-31-94\041R2501.D

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Andrew John Friedman
James E. Bruya, Ph.D.
(206) 285-8282

3012 16th Avenue West
Seattle, WA 98119-2029
FAX: (206) 283-5044

September 20, 1994

Dawn Wulf, Project Leader
Shannon & Wilson, Inc.
P.O. Box C-30313
Seattle, WA 98103

Dear Ms. Wulf:

The following are the results from the additional testing of material submitted on August 31, 1994 from Project T1540-02, CWE.

The characterization by GC/MS of sample 1540-14-20 isolated 34 compounds at levels high enough to characterize. The majority of the components isolated were characterized as petrogenic. The remaining components could not be characterized. None of the components gave mass spectra that were indicative of terpenes or terpenols.

Petrogenic Compounds	Terpenes/Terpenols	Unknowns
68%	nd	32%

We appreciate this opportunity to be of service to you and hope you will call if you should have any questions.

Sincerely,

Todd Crawford

Todd R. Crawford
Chemist

TRC/dp

Enclosures

FAX: 633-6777

TKC 08/31/94

Chain of Custody Record

Page 1 of 1

Laboratory FBI

Attn:

Shannon & Wilson, Inc.

400 N. 34th Street, Suite 100
Seattle, WA 98103
(206) 632-8020

11500 Olive Blvd., Suite 276
St. Louis, MO 63141
(314) 872-8170

2055 Hill Road
Fairbanks, AK 99707
(907) 479-0600

5430 Fairbanks Street, Suite 3
Anchorage, AK 99518
(907) 561-2120
Fax (907) 561-4483

Analysis Parameters/Sample Container Description
(include preservative if used)

Sample Identity	Lab No.	Time	Date Sampled	Comp.	Grab	WTPH-HCID	WTPH-G/BTEX	WTPH-D	WTPH-418.1				Total Number of Containers	Remarks/Matrix
1540-12-19	52401	1200	8/31/94		X	X	H	H	H				1	SOIL
1540-14-20	52402	1330	"		X	X	"	"	"				"	Char. by GC/MS
1540-09-21	52403	1355	"		X	X	"	"	"				"	
154022	52404	1445	"		X		"	"	"				"	
154023	52405	1445	"		X		"	"	"				"	per DW phone 9/13/94

Project Information		Sample Receipt	
Project Number: 7540-02		Total Number of Containers	5
Project Name: CWE		COC Seals/Intact Y/N/NA	—
Contact: D. WULF		Received Good Cond./Cold	Y
Ongoing Project? Yes ☒ No ☐		Delivery Method: (attached shipping bill, if any)	HAND
Sampler: T. FORKER			

Instructions

Requested Turn Around Time: 24 Hour on #1972, 3 days on #3

Special Instructions: Hold on "H" pending results of HCID. Only run what is found by HCID

Relinquished By: 1.	Relinquished By: 2.	Relinquished By: 3.
Signature: Tallie Forker Time: 1515	Signature: Time:	Signature: Time:
Printed Name: Tom FORKER Date: 8/31/94	Printed Name: Date:	Printed Name: Date:
Company: S+W	Company:	Company:

Received By: 1.	Received By: 2.	Received By: 3.
Signature: Kathy Miller Time: 3:15	Signature: Time:	Signature: Time:
Printed Name: Kathy Miller Date: 8/31	Printed Name: Date:	Printed Name: Date:
Company: FBI	Company:	Company:

Distribution: White - w/ shipment - returned to Shannon & Wilson w/ laboratory report
Yellow - w/ shipment - for consignee files
Pink - Shannon & Wilson - job file

F-19-91/UR-10/92

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Andrew John Friedman
James E. Bruya, Ph.D.
(206) 285-8282

3012 16th Avenue West
Seattle, WA 98119-2029
FAX: (206) 283-5044

September 2, 1994

Dawn Wulf, Project Leader
Shannon & Wilson, Inc.
P.O. Box C-30313
Seattle, WA 98103

Dear Ms. Wulf:

Enclosed are the results from the testing of material submitted on August 29, 1994 from Project T1540-02, CWE.

We appreciate this opportunity to be of service to you and hope you will call if you should have any questions.

Sincerely,

Todd R. Crawford
Chemist

TRC/dp

Enclosures

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: September 2, 1994
Date Received: August 29, 1994
Project: T1540-02, CWE
Date Samples Extracted: August 30, 1994

RESULTS FROM THE ANALYSIS OF SOIL SAMPLES FOR BENZENE, TOLUENE, ETHYLBENZENE, XYLENES AND GASOLINE USING EPA METHODS 8020 AND 8015 per Washington DOE Guidelines
Results Reported as µg/g (ppm)

Sample ID	Benzene	Toluene	Ethyl-benzene	Total Xylenes	Gasoline	Surrogate Standard % Recovery
1540-06-11	<0.02	<0.02	<0.02	<0.06	<1	106%
154012	<0.02	<0.02	0.06	0.44	6	106%
154013	<0.02	0.04	0.04	0.20	2	106%
154014	0.04	0.02	0.04	0.19	3	104%
154015	<0.02	<0.02	0.03	0.17	6	105%
154016	<0.02	<0.02	0.03	0.14	2	100%
154017	<0.02	<0.02	0.02	0.11	2	104%
154018	<0.02	<0.02	0.03	0.15	3	99%
Quality Assurance						
Blank	<0.02	<0.02	<0.02	<0.06	<1	108%
154018 (Duplicate)	<0.02	<0.02	<0.02	0.10	2	92%
154018 (Matrix Spike) % Recovery	50%	61%	65%	65%	na	92%
154018 (Matrix Spike Duplicate) % Recovery	62%	71%	80%	77%	na	81%
Spike Blank % Recovery	64%	74%	79%	77%	53%	80%
Spike Level	1	1	1	3	10	

[na] The analyte indicated was not added to the matrix spike sample.

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: September 2, 1994
Date Received: August 29, 1994
Project: T1540-02, CWE
Date Samples Extracted: August 30, 1994
Date Extracts Analyzed: August 30, 1994

RESULTS FROM THE ANALYSIS OF THE SOIL SAMPLE FOR FINGERPRINT CHARACTERIZATION BY CAPILLARY GAS CHROMATOGRAPHY USING A FLAME IONIZATION DETECTOR (FID) AND ELECTRON CAPTURE DETECTOR (ECD)

Sample ID	GC Characterization
1540-12-10	The GC/FID trace showed an absence of volatile or semi-volatile compounds. The medium boiling GC/ECD trace showed the possible presence of sulfur eluting from 16 to 19 minutes. The large peak seen near 25 minutes on the GC/FID trace is pentacosane, added as a quality assurance check for this GC analysis. There is a second internal standard peak seen on the GC/ECD trace at about 24 minutes which is dibutyl chlorendate.

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

Attachment to Report

Dated: September 28, 1994

To: Car Wash Enterprises
Attn: Mr. Jim Hansen

Important Information About Your Environmental Site Evaluation/Assessment Report

ENVIRONMENTAL EVALUATIONS/ASSESSMENTS ARE PERFORMED FOR SPECIFIC PURPOSES AND ENTITIES.

This report was prepared to meet the specific needs of a specific site(s). Unless indicated otherwise, we prepared your report expressly for you and for the purposes you indicated. No one other than you should apply this report for its intended purposes without first conferring with us. No party should apply this report for any purpose other than that originally contemplated without first conferring with the engineer/geoscientist.

The findings and conclusions documented in this site evaluation/assessment have been prepared for specific application to this project and have been developed in a manner consistent with that level of care and skill normally exercised by members of the environmental science profession currently practicing under similar conditions in this area. The conclusions presented are based on interpretation of information currently available to us and are made within the operational scope, budget, and schedule constraints of this project. No warranty, expressed or implied, is made.

OUR REPORT IS BASED ON PROJECT-SPECIFIC FACTORS.

Our environmental site assessment/evaluation is based on, but not limited to, several factors: reviewing public documents to chronicle site ownership for the past 30, 40, or more years; investigating the site's regulatory history to learn about permits granted or citations issued; determining prior uses of the site and those adjacent to it; reviewing available topographic and real estate maps, historic aerial photos, geologic information, and hydrologic data; reviewing readily available published information about surface and subsurface conditions; evaluating the potential for naturally occurring hazards; and interviewing public officials with respect to local concerns.

Except as noted within the text of the report, no quantitative laboratory testing was performed as part of the site assessment. Where such analyses were conducted by an outside laboratory, Shannon & Wilson relied upon the data provided and did not conduct an independent evaluation regarding the reliability of the data.

CONDITIONS CAN CHANGE.

Site conditions, both surface and subsurface, may be affected as a result of natural changes or human influence. An environmental site assessment/evaluation is based on conditions that existed at the time of the evaluation. Because so many aspects of a historical review rely on third party information, most consulting engineers will refuse to certify (warrant) that a site is free of contaminants, as it is impossible to know if such a condition exists. Contaminants may be present in areas that were not surveyed or sampled, or may migrate to areas that showed no signs of contamination when previously studied.

Unless our engineer/scientist indicates otherwise, your report should not be used when: 1) the size or configuration of the site is altered; 2) when the location of the site is modified; 3) when there is a change of ownership and/or use of the property; 4) for environmental subsurface conditions at an adjacent site; 5) for construction at an adjacent site or on site; or 6) in the event of floods, earthquakes, or other acts of God.

READ RESPONSIBILITY CLAUSES CAREFULLY.

Because environmental site assessments/evaluations are based extensively on judgment and opinion, it is far less exact than other design disciplines. This situation has resulted in wholly unwarranted claims being lodged against geotechnical/environmental consultants. To help prevent this problem, geotechnical/civil engineers and/or scientists have developed a number of clauses for use in their contracts, reports, and other documents. These responsibility clauses are not exculpatory clauses designed to transfer the engineer's or scientist's liabilities to other parties; rather, they are definitive clauses that identify where responsibilities begin and end. Their use helps all parties involved recognize their individual responsibilities and take appropriate action. Some of these definitive clauses may appear in this report, and you are encouraged to read them closely. Your engineer/scientist will be pleased to give full and frank answers to your questions.

Consulting engineers/scientists cannot accept responsibility for problems that may develop if they are not consulted after factors considered in their reports have changed. Therefore, it is incumbent upon you to notify your engineer/scientist of any factors that may have changed prior to submission of our final assessment/evaluation.

An assessment/evaluation of a site helps reduce your risk, but does not eliminate it. Even the most rigorous professional assessment may fail to identify all existing conditions.

ONE OF THE OBLIGATIONS OF YOUR CONSULTING ENGINEER/SCIENTIST IS TO PROTECT THE SAFETY, HEALTH, PROPERTY, AND WELFARE OF THE PUBLIC.

If our environmental site assessment/evaluation discloses the existence of conditions that may endanger the safety, health, property, or welfare of the public, we may be obligated (under rules of professional conduct, statutory law, or common law) to notify you and others of these conditions.

APPENDIX E

ANALYTICAL RESULTS FROM BIOREMEDIATION LAND TREATMENT CELL AT BROWN BEAR CAR WASY--INTERBAY SHANNON & WILSON, INC. SEPTEMBER 28, 1994

SHANNON & WILSON, INC.
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

SEATTLE
HANFORD
FAIRBANKS
ANCHORAGE
SAINT LOUIS
BOSTON

1954 40 1994

September 28, 1994

Car Wash Enterprises
3977 Leary Way N.W.
P. O. Box 70527
Seattle, Washington 98107-0527

Attn: Mr. Jim Hansen

RE: ANALYTICAL RESULTS FROM BIOREMEDIATION LAND TREATMENT CELL AT BROWN BEAR CAR WASH - INTERBAY, SEATTLE, WASHINGTON

This letter provides analytical results for samples collected from the bioremediation land treatment cell at the Interbay Brown Bear Car Wash located at 3435 15th Avenue West, Seattle, Washington. The purpose of this sampling was to determine if the soil complies with the Model Toxics Control Act (MTCA) Method A cleanup level for gasoline. This work was authorized by Mr. Jim Hansen of Car Wash Enterprises on August 26, 1994.

Approximately 600 cubic yards (cy) of soil is contained in a lined, bermed, bioremediation land treatment cell at the site. Gasoline-contaminated soil from several Brown Bear Car Wash underground storage tank cleanups was placed in the cell for treatment and has been actively land farmed (a form of bioremediation) by Car Wash Enterprises for the past several years.

On August 29, 1994, Shannon & Wilson collected seven samples from the stockpile at depths of 6 to 8 inches. The number of samples collected complies with the minimum requirements for a stockpile between 501 and 1,000 cy, per the *Washington State Department of Ecology Guidance for Site Checks and Site Assessments for Underground Storage Tanks* (rev. October 1992). Maximum concentrations of 6 parts per million (ppm) gasoline-range petroleum hydrocarbons (WTPH-G), 0.04 ppm benzene, 0.04 ppm toluene, 0.06 ppm ethylbenzene, and 0.44 ppm total xylenes were detected in the samples. Analytical results are summarized in Table 1, and a copy of the laboratory analytical report is attached.

The detected concentrations are below the February 1991 MTCA Method A cleanup levels for gasoline (100 ppm), benzene (0.5 pm), toluene (40 ppm), ethylbenzene (20 ppm), and total xylenes (20 ppm). The soil qualifies for disposal as a Class 2 soil in accordance with Ecology's *Guidance for Remediation Petroleum Contaminated Soils* dated April 1994. Car

T-1540-03

400 NORTH 34TH STREET • SUITE 100
P.O. BOX 300303
SEATTLE, WASHINGTON 98103
206 • 632 • 8020 FAX 206 • 633 • 6777

Wash Enterprises has indicated that the soil will remain on the southern portion of the site and be hydroseeded. This use of the soil is acceptable under the Class 2 disposal criteria.

The data presented in this report are based on limited research at the facility and should be considered representative at the time of our observations. Shannon & Wilson, Inc. performed this work within our best judgment to adequately describe site conditions at the facility. Changes in the conditions of the property can occur with time from both natural processes and human activities. In addition, changes in governmental codes, regulations, or law may occur. Due to such changes, our observations and recommendations applicable to this facility may need to be revised wholly or in part, due to changes beyond our control.

This report was prepared for the exclusive use of Car Wash Enterprises and in no way guarantees that an agency or its staff will reach the same conclusions as Shannon & Wilson, Inc. Shannon & Wilson has prepared the attached "Important Information About Your Environmental Site Evaluation" to assist you and others in understanding the use and limitations of our reports.

If you have any questions please call us at (206) 632-8020.

Sincerely,

SHANNON & WILSON, INC.

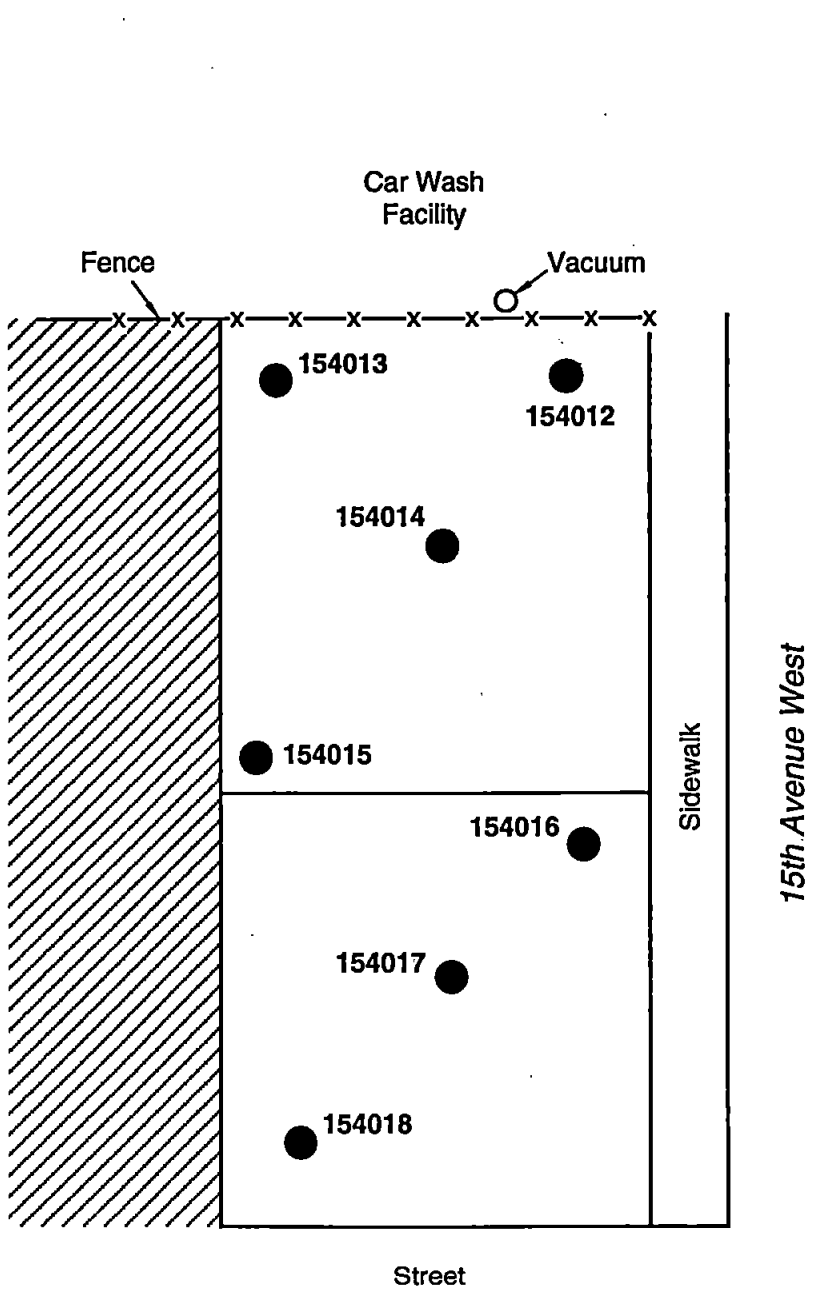
Dawn Wulf
Hydrogeologist

Brian L. Clark
Environmental Engineer

DW:BLC:JFZ/dw

Enclosures: Table 1 - Analytical Results
Figure 1 - Sampling Locations
Copy of Analytical Results
Important Information About Your Environmental Site Evaluation/ Assessment Report

T1540-03.LT2/T1540-lkd/dgw



Not to Scale

LEGEND

154012 ● Sampling Designation and Approximate Location

Car Wash Enterprises - Interbay
Seattle, Washington

SAMPLING LOCATIONS

September 1994 T-1540-02

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

FIG. 1

TABLE 1
ANALYTICAL RESULTS from LANDFARMED SOILS

Sample Number	WTPH-G (ppm)	Benzene (ppm)	Toluene (ppm)	Ethylbenzene (ppm)	Total Xylenes (ppm)
154012	6	<.02	<.02	0.06	0.44
154013	2	<.02	0.04	0.04	0.2
154014	3	0.04	0.02	0.04	0.19
154015	6	<.02	<.02	0.03	0.17
154016	2	<.02	<.02	0.03	0.14
154017	2	<.02	<.02	0.02	0.11
154018	3	<.02	<.02	0.03	0.15
MTCA Method A Soil Cleanup Levels	100	0.5	40	20	20

Notes:

Samples analyzed at Friedman & Bruya, Inc. in Seattle, Washington.
Lab report dated September 2, 1994.

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Andrew John Friedman
James E. Bruya, Ph.D.
(206) 285-8282

3012 16th Avenue West
Seattle, WA 98119-2029
FAX: (206) 283-5044

September 2, 1994

Dawn Wulf, Project Leader
Shannon & Wilson, Inc.
P.O. Box C-30313
Seattle, WA 98103

Dear Ms. Wulf:

Enclosed are the results from the testing of material submitted on August 29, 1994 from Project T1540-02, CWE.

We appreciate this opportunity to be of service to you and hope you will call if you should have any questions.

Sincerely,

Todd R. Crawford
Chemist

TRC/dp

Enclosures

FRIEDMAN & BRUYA, INC.

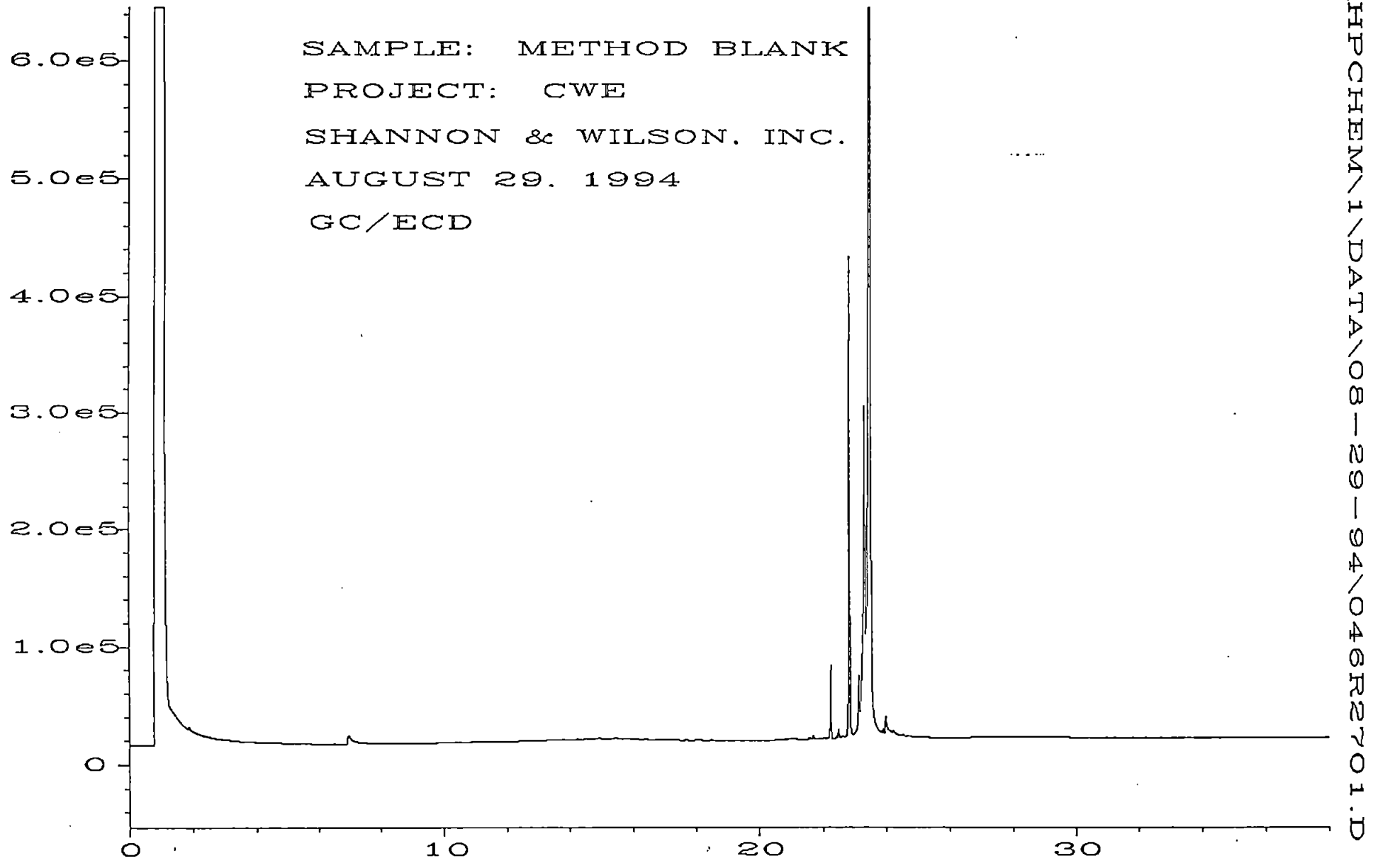
ENVIRONMENTAL CHEMISTS

Date of Report: September 2, 1994
Date Received: August 29, 1994
Project: T1540-02, CWE
Date Samples Extracted: August 30, 1994

RESULTS FROM THE ANALYSIS OF SOIL SAMPLES FOR BENZENE, TOLUENE, ETHYLBENZENE, XYLENES AND GASOLINE USING EPA METHODS 8020 AND 8015 per Washington DOE Guidelines
Results Reported as µg/g (ppm)

Sample ID	Benzene	Toluene	Ethyl-benzene	Total Xylenes	Gasoline	Surrogate Standard % Recovery
1540-06-11	<0.02	<0.02	<0.02	<0.06	<1	106%
154012	<0.02	<0.02	0.06	0.44	6	106%
154013	<0.02	0.04	0.04	0.20	2	106%
154014	0.04	0.02	0.04	0.19	3	104%
154015	<0.02	<0.02	0.03	0.17	6	105%
154016	<0.02	<0.02	0.03	0.14	2	100%
154017	<0.02	<0.02	0.02	0.11	2	104%
154018	<0.02	<0.02	0.03	0.15	3	99%
Quality Assurance						
Blank	<0.02	<0.02	<0.02	<0.06	<1	108%
154018 (Duplicate)	<0.02	<0.02	<0.02	0.10	2	92%
154018 (Matrix Spike) % Recovery	50%	61%	65%	65%	na	92%
154018 (Matrix Spike Duplicate) % Recovery	62%	71%	80%	77%	na	81%
Spike Blank % Recovery	64%	74%	79%	77%	53%	80%
Spike Level	1	1	1	3	10	

[na] The analyte indicated was not added to the matrix spike sample.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PROJECT: CWE
SHANNON & WILSON. INC.
AUGUST 29. 1994
GC/ECD
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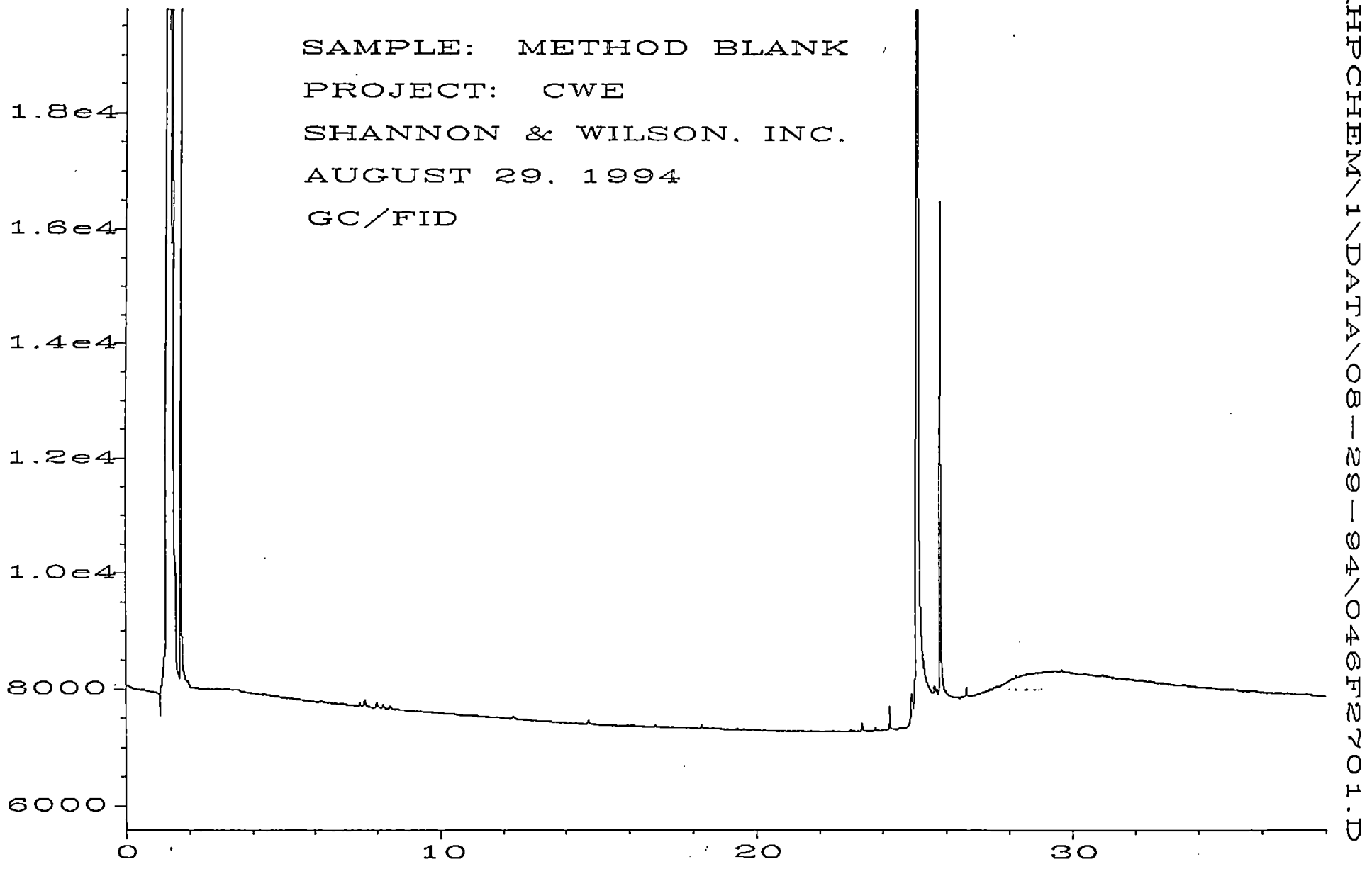
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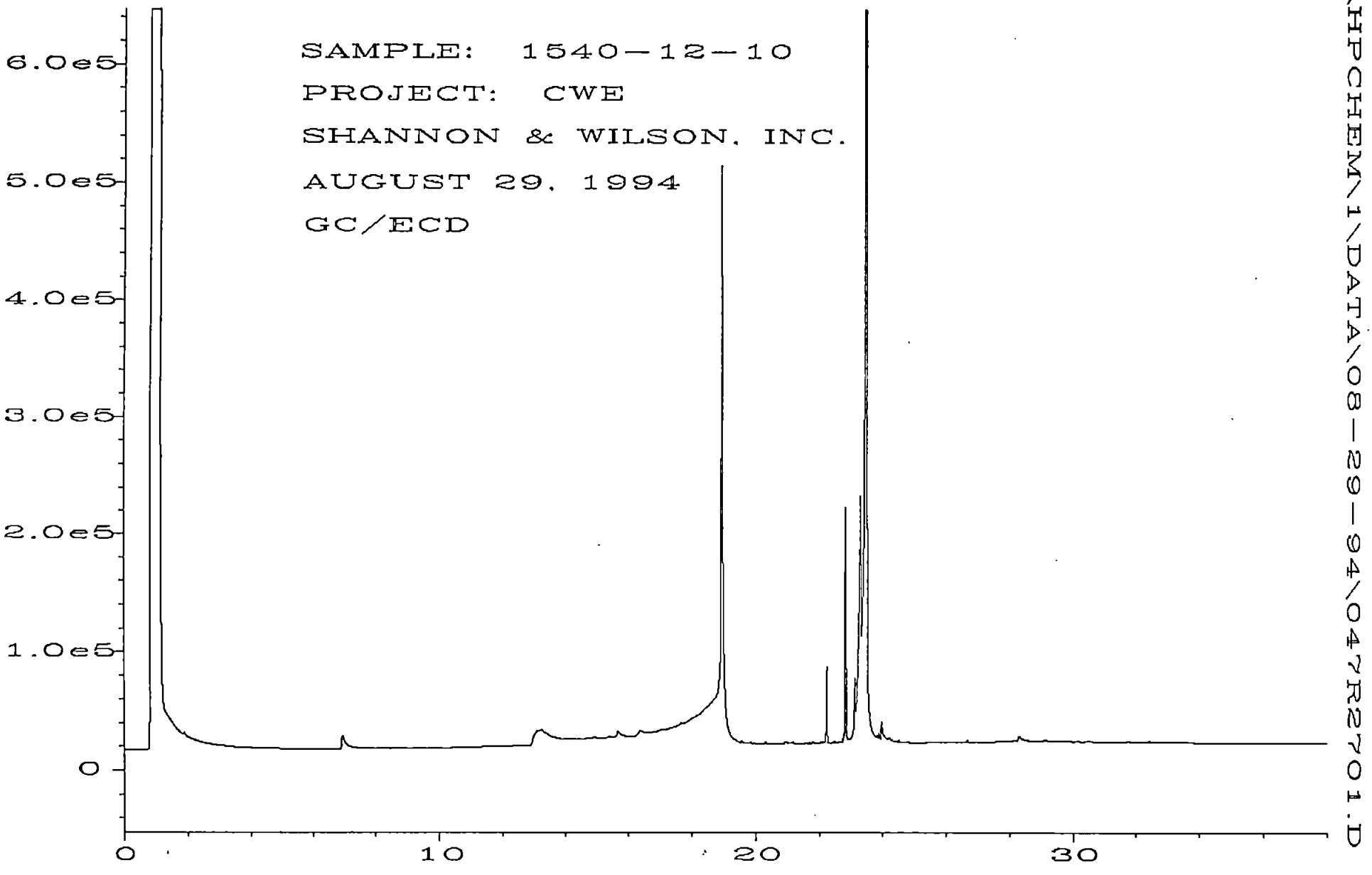
PROJECT: CWE
SHANNON & WILSON. INC.
AUGUST 29. 1994
GC/FID
1.8e4
1.6e4
1.4e4
1.2e4
1.0e4
8000
6000
0
10
20
30
C:\HPCHEM\1\DATA\08-29-94\046F2701.D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PROJECT: CWE
SHANNON & WILSON, INC.
AUGUST 29, 1994
GC/ECD
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4.0e5
3.0e5
2.0e5
1.0e5
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0
10
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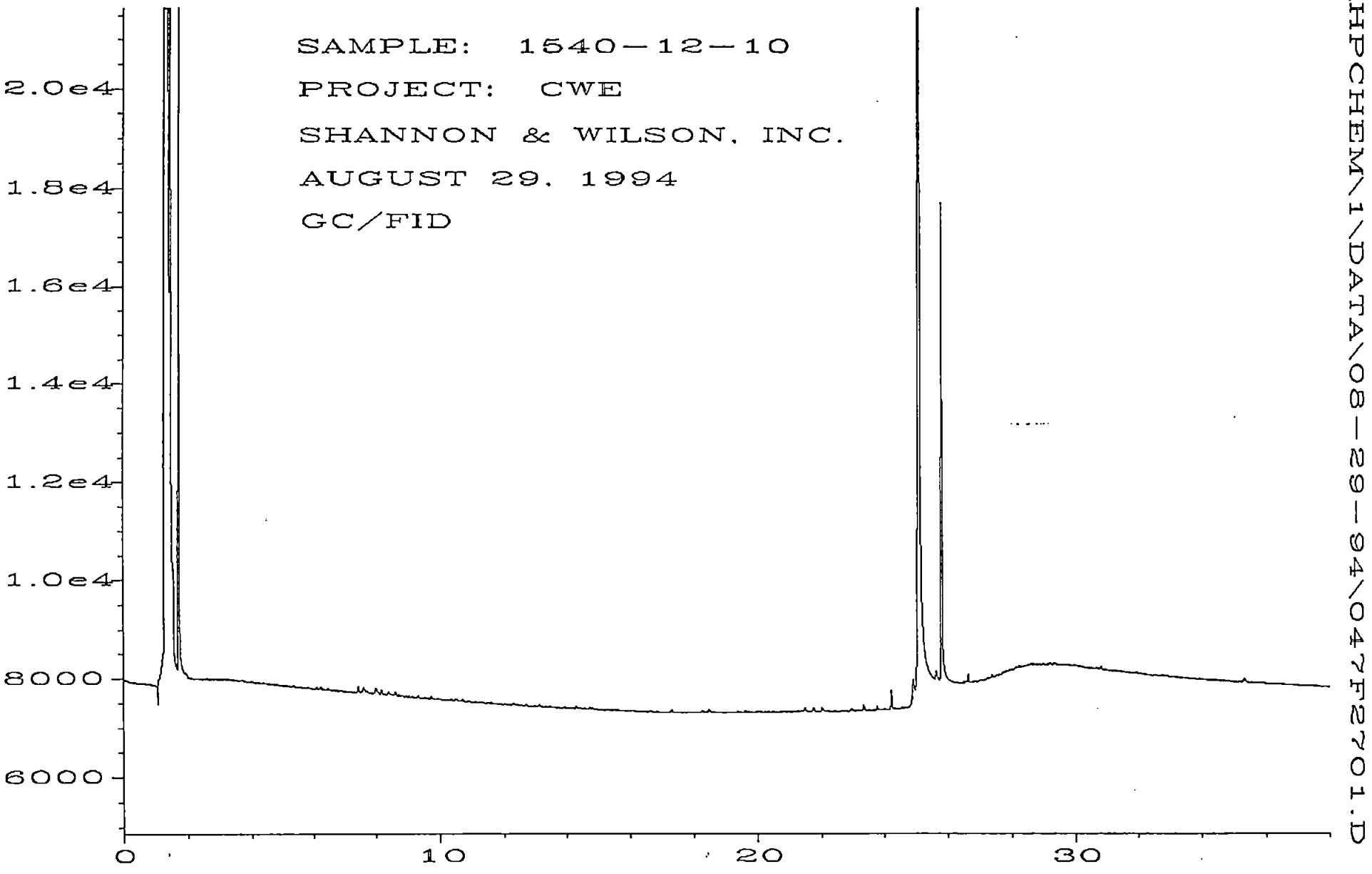
SAMPLE: 1540-12-10
PROJECT: CWE
SHANNON & WILSON, INC.
AUGUST 29, 1994
GC/FID
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1.6e4
1.4e4
1.2e4
1.0e4
8000
6000
0
10
20
30
C:\HPCHEM\1\DATA\08-29-94\047F2701.D

08/29/94

Shannon & Wilson, Inc.

Chain of Custody Record

Page 1 of 1

Laboratory FBT 4:20

Attn: _____

400 N. 34th Street, Suite 100
Seattle, WA 98103
(206) 632-8020

11500 Olive Blvd., Suite 276
St. Louis, MO 63141
(314) 872-8170

2055 Hill Road
Fairbanks, AK 99707
(907) 479-0600

5430 Fairbanks Street, Suite 3
Anchorage, AK 99518
(907) 561-2120
Fax (907) 561-4483

Analysis Parameters/Sample Container Description
(include preservative if used)

Sample Identity	Lab No.	Time	Date Sampled	Comp.	Grab	Characterization by GAS CHROMATOGRAPHY	WTPH-G/BTEX	WTPH-D					Total Number of Containers	Remarks/Matrix
1540-12-10	52356	1320	8/29/94		X	X							1 oz	SOIL
1540-06-11	52357	1325				X	X	per DW phone 8/30/94 Add'l					Add'l	
154012	52358	1500					X	H					4 oz	
154013	52359						X	H						
154014	52360						X	H						
154015	52361						X	H						
154016	52362						X	H						
154017	52363						X	H						
154018	52364						X	H						

Project Information		Sample Receipt	
Project Number:	T1540-02	Total Number of Containers	9
Project Name:	CWE	COC Seals/Intact Y/N/NA	—
Contact:	D. WULF B. CLARK	Received Good Cond./Cold	—
Ongoing Project?	Yes [X] No [ ]	Delivery Method:	HAND
Sampler:	T. FORKER	(attached shipping bill, if any)	

Instructions

Requested Turn Around Time: 24 hours on #10 & #11

Special Instructions: 2 week on 12 → 18
extend G so that if there appears to be D. then run D. call Brian Clark w/?

Relinquished By: 1.	Relinquished By: 2.	Relinquished By: 3.
Signature: Tolli Forker Time: 1600	Signature: Time:	Signature: Time:
Printed Name: Tolli Forker Date: 8/29/94	Printed Name: Date:	Printed Name: Date:
Company: S&W	Company:	Company:

Received By: 1.	Received By: 2.	Received By: 3.
Signature: Kathy Miller Time: 4:20	Signature: Time:	Signature: Time:
Printed Name: Kathy Miller Date: 8/29/94	Printed Name: Date:	Printed Name: Date:
Company: FBL	Company:	Company:

Distribution: White - w/ shipment - returned to Shannon & Wilson w/ laboratory report
Yellow - w/ shipment - for consignee files
Pink - Shannon & Wilson - job file

F-19-91/UR-r9/92

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

Dated: September 28, 1994

To: Car Wash Enterprises
Attn: Mr. Jim Hansen

Important Information About Your Environmental Site Evaluation/Assessment Report

ENVIRONMENTAL EVALUATIONS/ASSESSMENTS ARE PERFORMED FOR SPECIFIC PURPOSES AND ENTITIES.

This report was prepared to meet the specific needs of a specific site(s). Unless indicated otherwise, we prepared your report expressly for you and for the purposes you indicated. No one other than you should apply this report for its intended purposes without first conferring with us. No party should apply this report for any purpose other than that originally contemplated without first conferring with the engineer/geoscientist.

The findings and conclusions documented in this site evaluation/assessment have been prepared for specific application to this project and have been developed in a manner consistent with that level of care and skill normally exercised by members of the environmental science profession currently practicing under similar conditions in this area. The conclusions presented are based on interpretation of information currently available to us and are made within the operational scope, budget, and schedule constraints of this project. No warranty, expressed or implied, is made.

OUR REPORT IS BASED ON PROJECT-SPECIFIC FACTORS.

Our environmental site assessment/evaluation is based on, but not limited to, several factors: reviewing public documents to chronicle site ownership for the past 30, 40, or more years; investigating the site's regulatory history to learn about permits granted or citations issued; determining prior uses of the site and those adjacent to it; reviewing available topographic and real estate maps, historic aerial photos, geologic information, and hydrologic data; reviewing readily available published information about surface and subsurface conditions; evaluating the potential for naturally occurring hazards; and interviewing public officials with respect to local concerns.

Except as noted within the text of the report, no quantitative laboratory testing was performed as part of the site assessment. Where such analyses were conducted by an outside laboratory, Shannon & Wilson relied upon the data provided and did not conduct an independent evaluation regarding the reliability of the data.

CONDITIONS CAN CHANGE.

Site conditions, both surface and subsurface, may be affected as a result of natural changes or human influence. An environmental site assessment/evaluation is based on conditions that existed at the time of the evaluation. Because so many aspects of a historical review rely on third party information, most consulting engineers will refuse to certify (warrant) that a site is free of contaminants, as it is impossible to know if such a condition exists. Contaminants may be present in areas that were not surveyed or sampled, or may migrate to areas that showed no signs of contamination when previously studied.

Unless our engineer/scientist indicates otherwise, your report should not be used when: 1) the size or configuration of the site is altered; 2) when the location of the site is modified; 3) when there is a change of ownership and/or use of the property; 4) for environmental subsurface conditions at an adjacent site; 5) for construction at an adjacent site or on site; or 6) in the event of floods, earthquakes, or other acts of God.

READ RESPONSIBILITY CLAUSES CAREFULLY.

Because environmental site assessments/evaluations are based extensively on judgment and opinion, it is far less exact than other design disciplines. This situation has resulted in wholly unwarranted claims being lodged against geotechnical/environmental consultants. To help prevent this problem, geotechnical/civil engineers and/or scientists have developed a number of clauses for use in their contracts, reports, and other documents. These responsibility clauses are not exculpatory clauses designed to transfer the engineer's or scientist's liabilities to other parties; rather, they are definitive clauses that identify where responsibilities begin and end. Their use helps all parties involved recognize their individual responsibilities and take appropriate action. Some of these definitive clauses may appear in this report, and you are encouraged to read them closely. Your engineer/scientist will be pleased to give full and frank answers to your questions.

Consulting engineers/scientists cannot accept responsibility for problems that may develop if they are not consulted after factors considered in their reports have changed. Therefore, it is incumbent upon you to notify your engineer/scientist of any factors that may have changed prior to submission of our final assessment/evaluation.

An assessment/evaluation of a site helps reduce your risk, but does not eliminate it. Even the most rigorous professional assessment may fail to identify all existing conditions.

ONE OF THE OBLIGATIONS OF YOUR CONSULTING ENGINEER/SCIENTIST IS TO PROTECT THE SAFETY, HEALTH, PROPERTY, AND WELFARE OF THE PUBLIC.

If our environmental site assessment/evaluation discloses the existence of conditions that may endanger the safety, health, property, or welfare of the public, we may be obligated (under rules of professional conduct, statutory law, or common law) to notify you and others of these conditions.