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GeoEngineers

Summary Report for Soil Boring and Monitoring Well Installation

Texaco Service Station 63-057-0010
1501 West Northern Lights Boulevard
Anchorage, Alaska
ADEC File No. L25.20

September 25, 2001

For

Equiva Services, LLC

RECEIVED
SEP 28 2001
Dept. of Environmental Conservation
Underground Storage Tanks — FAP

September 26, 2001

Equiva Services, LLC
10602 NE 38th Place
Kirkland, Washington 98033

Attention: Anthony J. Palagyi

Summary Report for Soil Boring and
Monitoring Well Installation
Texaco Service Station #63-057-0010
1501 West Northern Lights Boulevard
Anchorage, Alaska
ADEC File No. L25.20
GEI File No. 0401-064-02

INTRODUCTION AND BACKGROUND

This report presents the results of our site investigation at Texaco Service Station #63-057-0010. The site is located at 1501 West Northern Lights Boulevard in Anchorage, Alaska. The Alaska Department of Environmental Conservation (ADEC) file number for this site is L25.20. The site relative to surrounding physical features is shown on Figure 1.

Existing site facilities include a service station building with a convenience store and an automotive maintenance facility; two covered pump islands located east, and one covered pump island located south of the building; four product underground storage tanks (USTs); and associated buried product lines. Station upgrades were conducted in 1996 and included removal of a 550-gallon waste oil UST and replacement of fuel dispensers and associated product piping. The general layout of the service station facility and select prior sample locations are shown on Figure 1.

SCOPE

Our scope of work included installing two monitoring wells along the downgradient edge of the property at the location shown on Figure 1, and conducting quarterly ground water monitoring and sampling for one year. Our specific scope of services proposed for this site is described below:

GeoEngineers, Inc.
4951 Eagle Street
Anchorage, AK 99503-7432
Telephone (907) 561-3478
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MONITORING WELL INSTALLATION

1. Prepared a site health and safety plan for field personnel and subcontractors involved in the soil boring explorations.
2. Conducted a public utility locate for the site prior to drilling activities to establish final well locations.
3. Monitored the drilling of two soil borings (MW-E and MW-F) to depths of approximately 20 feet below ground surface (bgs) using hollow-stem auger drilling techniques.
4. Obtained soil samples from each boring using a split spoon sampler at approximate 2.5-foot intervals from the surface to 10 feet bgs, and at 5-foot intervals from 10 feet bgs to the total depth of each boring. Field screened the representative soil samples for evidence of petroleum contamination using visual and headspace vapor screening methods.
5. Based on field screening results, submitted one to two soil samples from each boring to North Creek Analytical, Inc. (NCA) for chemical analysis of gasoline-range organics (GRO)/benzene, ethylbenzene, toluene and xylenes (BETX) by Alaska Method AK101; for diesel-range organics (DRO) by Alaska Method AK102; and for residual-range organics (RRO) by Alaska Method AK103. The field representative wore clean, disposable, nitrile gloves while collecting the soil samples. All soil samples were placed in laboratory-supplied containers in the field, and kept cool under chain-of-custody procedures during transport to the laboratory.
6. Monitored the installation of a 2-inch-diameter polyvinyl chloride (PVC) monitoring well in each boring to a depth of approximately 20 feet bgs. Constructed each well with 10 feet of 0.020-inch slot width screen (9.5 to 19.5 feet bgs), 10 feet of blank Schedule 40 PVC pipe (0.5 to 9.5 feet bgs), and a locking watertight well cap. Completed the wells with a medium sand pack, bentonite well seal, concrete collar and a steel monument installed flush with grade.
7. Contained all soil cuttings generated during drilling operations in a 55-gallon drum and temporarily stored this on the Texaco service station site. The cuttings will be characterized for transport to an authorized facility for disposal, if necessary.
8. Developed monitoring wells MW-E and MW-F and temporarily contained the development water in a 55-gallon drum on site. Development water generated during the August 2001 event was treated and disposed of by Alaska Pollution Control (APC) of Anchorage on August 24, 2001.

GROUND WATER SAMPLING

1. Surveyed the elevation of the new monitoring wells to the top of the well casing and the ground surface, using the elevation of an existing monitoring well for reference.
2. Measured the depth to ground water in the existing monitoring wells and the two new monitoring wells to an accuracy of 0.01 feet using an electronic water level indicator.

3. Calculated the well casing water volume for purging and sampling from the static ground water level in the monitoring wells.
4. Purged each ground water monitoring well by removing three times the standing well volume prior to sampling. Purge water generated during the August 2001 event was treated and disposed of by APC of Anchorage on August 24, 2001.
5. Collected representative ground water samples from the two new monitoring wells and from existing monitoring wells MW-1, MW-C and MW-D using a new, disposable, 1.6-inch-diameter disposable bailer and nylon cord to minimize the possibility of cross-contamination.
6. Submitted the ground water samples to NCA for chemical analysis as follows: MW-1, MW-E and MW-F were analyzed for DRO/RRO by Methods AK102/103 and polynuclear aromatic hydrocarbons (PAH) by U.S. Environmental Protection Agency (EPA) Method 8270-SIM; and MW-C, MW-D, MW-E and MW-F were analyzed for GRO/BETX by Method AK101.

REPORTING

1. Evaluated the field and laboratory data generated during the site investigation with respect to existing regulatory concerns.
2. Prepared a written summary report that presents the results of our field observations and subsurface explorations of soil and ground water beneath the site.

A detailed description of field methods for the above scope items is included in Appendix A.

SUBSURFACE CONDITIONS

SOIL BORING

Soil encountered during drilling consisted of brown sand with silt and gravel from beneath the asphalt pavement surface to approximately 18.0 feet bgs. Gray silty clay was encountered below 18.0 feet to the total depth explored (20.0 feet bgs) for borings MW-E and MW-F. The boring locations are shown on Figure 2. GeoEngineers' monitoring well logs are presented in Attachment A.

GROUND WATER CONDITIONS

Ground water was encountered in the borings at a depth of approximately 13.0 feet bgs during drilling. Free phase petroleum (free-product) was not encountered on ground water in the newly installed monitoring wells. Depth to ground water for monitoring wells MW-E and MW-F at the time of ground water sampling was 12.70 feet bgs and 13.19 feet bgs, respectively. Ground water elevation data from historical monitoring events and the current monitoring event are summarized in Table 2.

SUBSURFACE CONTAMINATION

Analytical data for soil samples analyzed by NCA during this investigation are summarized in Table 1 and presented in Attachment B. Ground water analytical data supplied by NCA is

summarized in Table 3 and presented in Attachment B. These analytical results are discussed below.

SOIL ANALYTICAL RESULTS

Soil samples were collected for chemical analyses from depth intervals of 5.0-7.0 feet and 12.5-13.0 feet bgs in MW-E on August 7, 2001. These intervals were selected for analysis based on field screening results. The representative soil samples were submitted for analysis of GRO/BETX by Alaska Method AK101, DRO by Alaska Method AK102, and RRO by Alaska Method AK103.

GRO and BETX constituents were not detected in any of the soil samples submitted from boring MW-E, with the exception of the 12.5-13.0-foot interval. The MW-E 12.5-13.0-foot interval had a detection of 0.00733 milligrams per kilogram (mg/kg) in the benzene range, which is less than the respective ADEC clean-up level for benzene of 0.02 mg/kg. Toluene and xylene constituents were detected in the soil sample submitted from boring MW-F at the 12.5-13.0-foot interval at 0.0335 mg/kg and 0.0378 mg/kg, respectively. These values are less than the respective ADEC clean-up levels for toluene and xylene of 5.4 mg/kg and 78 mg/kg, respectively.

DRO and RRO were not detected in any of the soil samples submitted from borings MW-E and MW-F.

The soil chemical analytical data for samples obtained during this scope of work are summarized in Table 1 and on Figure 3. The laboratory reports and chain-of-custody records are included in Attachment B.

GROUND WATER ANALYTICAL RESULTS

Representative ground water samples were collected from monitoring wells MW-1, MW-C, MW-D, MW-E and MW-F. The ground water samples were submitted to NCA for chemical analysis as follows: MW-1, MW-E and MW-F were analyzed for DRO/RRO by Methods AK102/103 and for PAH by EPA Method 8270-SIM; MW-C, MW-D, MW-E and MW-F were analyzed for GRO/BETX by Method AK101.

GRO and BETX constituents were detected in the ground water samples submitted from monitoring wells MW-C, MW-D, MW-E and MW-F. Benzene concentrations exceeding ADEC's most stringent cleanup levels were measured in the samples collected from MW-E and the duplicate sample from MW-C at 25.0 micrograms per liter (µg/l) and 5.54 µg/l, respectively. Toluene, ethylbenzene and xylene concentrations were detected below ADEC cleanup levels in monitoring wells MW-C, MW-D, MW-E and MW-F. GRO was detected greater than ADEC's most stringent cleanup levels in monitoring wells MW-C and MW-E at 3,440 µg/l and 4,850 µg/l, respectively.

DRO was detected in monitoring wells MW-1, MW-E and MW-F at concentrations less than ADEC cleanup levels. It was noted in the laboratory reports that the DRO detection in MW-1 was due to an overlap in hydrocarbon concentrations resulting from the RRO spectrum, and that the

DRO detection in monitoring wells MW-E and MW-F was a result of an overlap in hydrocarbon concentrations from the GRO spectrum.

RRO was detected at a concentration of 1.69 milligrams per liter (mg/l) in monitoring well MW-1, which exceeds the ADEC cleanup level of 1.1 mg/l. RRO was not detected in monitoring wells MW-E and MW-F.

PAH constituents were not detected in monitoring well MW-1; however, naphthalene was detected in monitoring wells MW-E and MW-F at concentrations less than ADEC cleanup levels.

The ground water chemical analytical data for monitoring well samples obtained from this and historical monitoring events are summarized in Table 3. BETX/GRO, DRO and RRO results for monitoring well samples obtained from this and historical monitoring events are summarized on Figure 4. The laboratory reports and chain-of-custody records are included in Attachment B.

SUMMARY

Concentrations of GRO, DRO and RRO were not detected in any of the soil samples submitted for chemical analysis from soil borings MW-E and MW-F. BETX constituents were either not detected or detected below ADEC cleanup levels for all soil samples submitted from soil borings MW-E and MW-F.

GRO and benzene concentrations were measured exceeding ADEC cleanup levels in representative ground water samples collected from monitoring wells MW-C and MW-E. However, these concentrations fall within ADEC's parameters for cleanup under the 10X Rule (18AAC75.345), provided the ground water use criteria is met for this area. We recommend conducting a ground water use survey in accordance with 18AAC75.350 to determine applicability of these cleanup standards.

LIMITATIONS

We have prepared this report for use by Equiva Services, LLC. This report may be made available to regulatory agencies and to other parties, as designated by Equiva. The report is not intended for use by others, and the information contained herein is not applicable to other sites.

Our interpretation of soil and ground water conditions is based on field observations, our review of chemical analytical data and our review of information prepared by others.

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

We appreciate the opportunity to be of service to Equiva Services, LLC. Please contact us if you have questions regarding this report.

Yours very truly,

GeoEngineers, Inc.

Jamie J. Oakley
Geologist

Scott E. Widness, P.E.
Principal

JJO:SEW:skl
Document ID: 040106402sr.doc

Attachments

Two copies submitted

cc: Robert Weimer
ADEC - Anchorage Office

TABLE 1
SUMMARY OF FIELD SCREENING AND CHEMICAL ANALYTICAL RESULTS - SOIL[1]
TEXACO SERVICE STATION #63-057-0010
1501 NORTHERN LIGHTS BOULEVARD, ANCHORAGE, ALASKA
GEI FILE NO. 0401-064-02

Soil Sample Number	Date Sampled	Depth (feet)	Field Screening Results[2]		BETX[3] ADEC Method AK101 (mg/kg)				GRO[4] (mg/kg)	DRO[5] (mg/kg)	RRO[6] (mg/kg)
			Headspace Vapor (ppm)	Sheen	B	E	T	X			
MW-E (5'-7')	08/07/01	5'-7'	0.0	SS	<0.00758	<0.0190	<0.0190	<0.0379	<1.90	<4.00	<25.0
MW-E (12.5'-13')	08/07/01	12.5'-13'	0.0	NS	0.00733	<0.0171	<0.0171	<0.0342	<1.71	<4.00	<25.0
MW-F (12.5'-13')	08/07/01	12.5'-13'	0.0	NS	<0.00731	<0.0183	0.0335	0.0378	<1.83	<4.00	<25.0
ADEC Method 2 Cleanup Levels[7]			NA	NA	0.02	5.5	5.4	78	300	250	11,000

Notes:

[1]Laboratory analysis conducted by North Creek Analytical in Bothell, Washington.

[2]Field screening methods are described in Attachment A. Headspace vapor was measured with a MicroTIP photoionization detector (PID) calibrated to 100 ppm isobutylene. NS = no sheen, SS = slight sheen

[3]B = benzene, E = ethylbenzene, T = toluene, X - xylenes

[4]GRO = Gasoline-Range Organics by Alaska Department of Environmental Conservation (ADEC) Method AK101

[5]DRO = Diesel-Range Organics by ADEC Method AK102

[6]RRO = Residual-Range Organics by ADEC Method AK103

[7]Alaska Department of Environmental Conservation (ADEC) Method 2 Cleanup Levels - under 40-inch Zone, migration to ground water zone

ppm = parts per million

mg/kg = milligrams per kilogram (parts per million)

"<" = not detected at or above laboratory reporting limits shown

NA = not applicable

TABLE 2
SUMMARY OF GROUND WATER ELEVATION DATA
TEXACO SERVICE STATION 63-057-0010
1501 WEST NORTHERN LIGHTS BOULEVARD
ANCHORAGE, ALASKA
GEI JOB #0401-064-02

Monitoring Well	Top of Casing Elevation[1] (feet)	Date	Depth to Water From Top of Casing (feet)	Ground Water Elevation (feet)
MW-1	98.99	10/28/99	13.67	85.32
		12/07/99	13.82	85.17
		08/07/01	13.74	85.25
MW-A	98.35	10/28/99	12.89	85.46
		12/07/99	13.04	85.31
		12/07/99	12.97	85.38
MW-B	98.37	10/28/99	13.12	85.25
		12/07/99	13.28	85.09
		12/07/99	13.21	85.16
MW-C	98.69	10/28/99	13.36	85.33
		12/07/99	13.39	85.30
		12/07/99	13.31	85.38
MW-D	99.27	10/28/99	14.17	85.10
		12/07/99	14.21	85.06
		12/07/99	14.18	85.09
MW-E	97.66	08/09/01	12.70	84.96
MW-F	98.14	08/09/01	13.19	84.95

Notes:
[1]Elevations are relative to an assumed site datum (southeast building corner)

TABLE 3 (Page 1 of 2)
SUMMARY OF RECENT AND HISTORICAL CHEMICAL ANALYTICAL RESULTS - GROUND WATER[1]
TEXACO SERVICE STATION 63-057-0010
1501 WEST NORTHERN LIGHTS BOULEVARD, ANCHORAGE, ALASKA
GEI JOB #0401-064-02

Well ID	Date Sampled	BETX[2] EPA Method 8021B (µg/l)				GRO[3] (µg/l)	DRO[4] (mg/l)	RRO[5] (mg/l)	Dissolved Metals[6] (mg/l)	PAH[7] (µg/l)
		B	E	T	X					
MW-1	12/03/97	<0.05	<0.05	<0.05	<1.0	<50.0	5.77	--	Barium = 0.0286 Silver = 0.0270	-- --
	12/07/99	--	--	--	--	--	1.34 [8]	3.57	Barium = 0.0237 Chromium = 0.00207	-- --
	08/07/01	--	--	--	--	--	0.581 [8]	1.69	--	ND
MW-A	12/07/99	--	--	--	--	--	<0.100	<0.750	Barium = 0.0335	--
MW-B	12/07/99	--	--	--	--	--	0.112	<0.750	Barium = 0.0251	--
MW-C	12/07/99	<50.0 [9]	789	72.3	9,560	30,800	1.89 [10]	<0.750	--	--
	12/07/99*	27.9	801	120	9,470	30,600	2.05 [10]	<0.750	--	--
	08/07/01	1.96	3.34	0.867	54.2	1,490	--	--	--	--
	08/07/01*	5.54	7.70	1.98	107	3,440	--	--	--	--
MW-D	12/07/99	<28.6 [9]	<3.40 [9]	<14.6 [9]	84.4	2,730	0.829	<0.750	--	--
	08/07/01	4.38	39.6	0.675	72.1	1,030	--	--	--	--
MW-E	08/07/01	25.0	231	61.9	3,110	4,850	0.957 [9]	<0.750	--	Naphthalene = 8.29
MW-F	08/07/01	2.20	28.4	0.728	45.6	487	0.273 [9]	<0.750	--	Naphthalene = 0.309
ADEC Ground Water Cleanup Levels		5	700	1,000	10,000	1,300	1.5	1.1	Barium = 2.0 Silver = 0.18 Chromium = 0.1	Naphthalene = 1,460

Notes appear on page 2 of 2.

TABLE 3 (Page 2 of 2)

Notes:

[1]Laboratory analysis conducted by North Creek Analytical in Bothell, Washington.

[2]B = benzene, E = ethylbenzene, T = toluene, X = xylenes

[3]GRO = Gasoline-Range Organics by ADEC Method AK101

[4]DRO = Diesel-Range Organics by ADEC Method AK102

[5]RRO = Residual-Range Organics by ADEC Method AK103

[6]Dissolved Metals by EPA Method Series 6000/7000. Includes arsenic, barium, cadmium, chromium, lead, selenium, mercury and silver. These metals were not detected in the sample unless noted otherwise.

[7]PAH = Polynuclear Aromatic Hydrocarbons by EPA Method 8270-SIM

[8]Laboratory notes indicate that results in the diesel range are primarily due to overlap from a heavy-oil-range product.

[9]Laboratory reporting limit for this sample was raised to account for interference from coeluting organic compounds present in the sample.

[10]Laboratory notes indicate that results in the diesel range are primarily due to overlap from a gasoline-range product.

EPA = U.S. Environmental Protection Agency

µg/l = micrograms per liter

mg/l = milligrams per liter

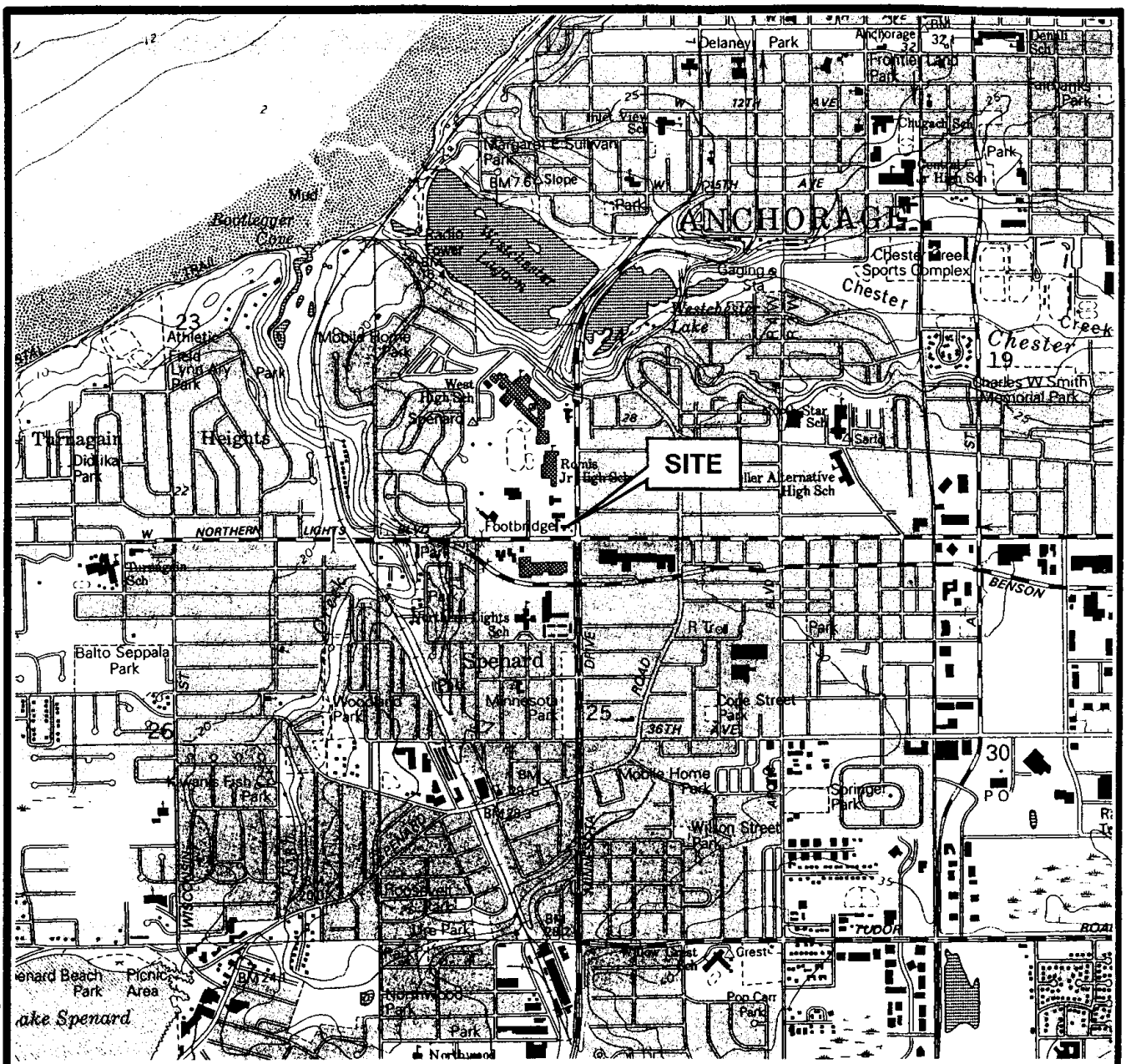
"<" or ND = analyte not detected at or above laboratory method reporting limits

"--" = not analyzed

"*" = duplicate sample

ADEC = Alaska Department of Environmental Conservation

Shading indicates concentrations greater than ADEC ground water cleanup levels.



Reference:
USGS 7.5' topographic quadrangle map "Anchorage A-8, NW, AK." 1979 photorevised in 1994.

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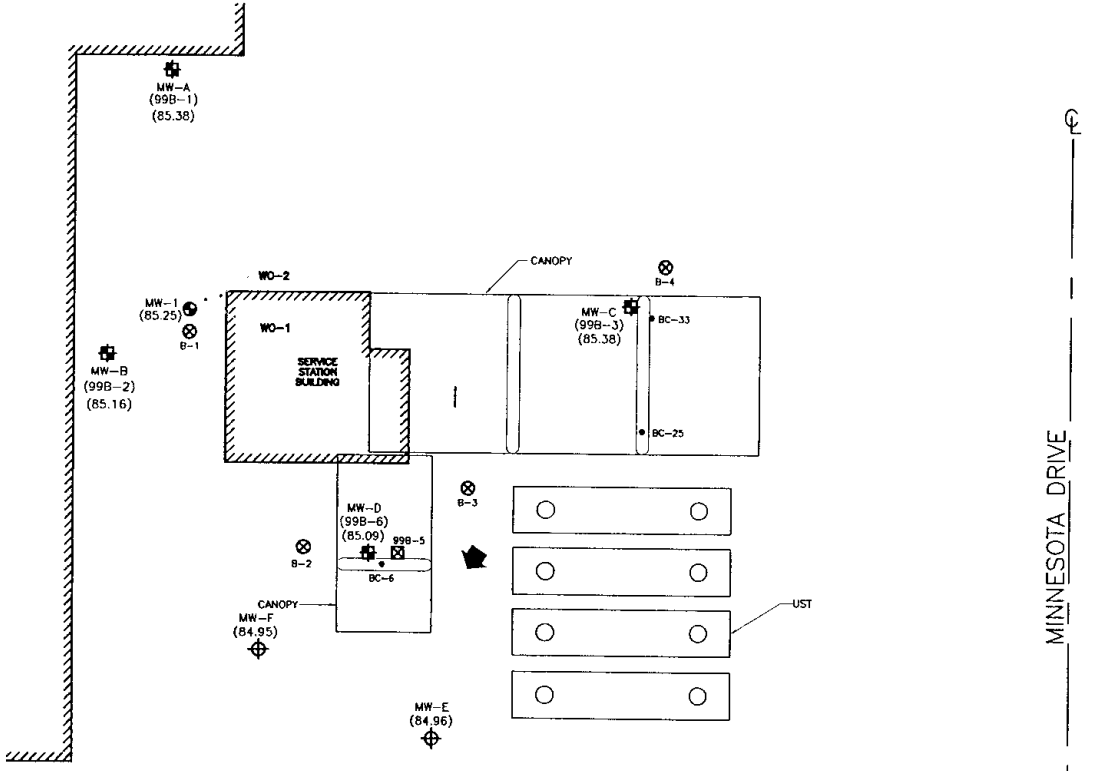
VICINITY MAP

FIGURE 1

Anchorage P:\0401064\02\AutoCAD\040106402 F1 vm.dwg 09/20/01 JJO:DKR



EXPLANATION

BC-6 ●	SOIL SAMPLE BY GEOENGINEERS ON 09/24/96 AND 10/04/96
B-2 ⊗	SOIL BORING BY GEOENGINEERS ON 08/06/97
MW-1 (85.25) ◕	MONITORING WELL BY GEOENGINEERS ON 12/02/97, WITH GROUND WATER ELEVATION, IN FEET
99B-5 ⊠	BORING BY GEOENGINEERS ON 10/27/99
MW-C (99B-3) (85.38) ⊞	BORING AND MONITORING WELL BY GEOENGINEERS ON 10/26/99 - 10/28/99, WITH GROUND WATER ELEVATION, IN FEET
MW-E (84.96) ⊕	BORING AND MONITORING WELL BY GEOENGINEERS ON 08/07/01, WITH GROUND WATER ELEVATION, IN FEET
◣	INFERRED GROUND WATER FLOW DIRECTION

TEXACO FACILITY No. 63-057-0010
1501 NORTHERN LIGHTS BLVD
ANCHORAGE, AK

Note: The locations of all features shown are approximate.

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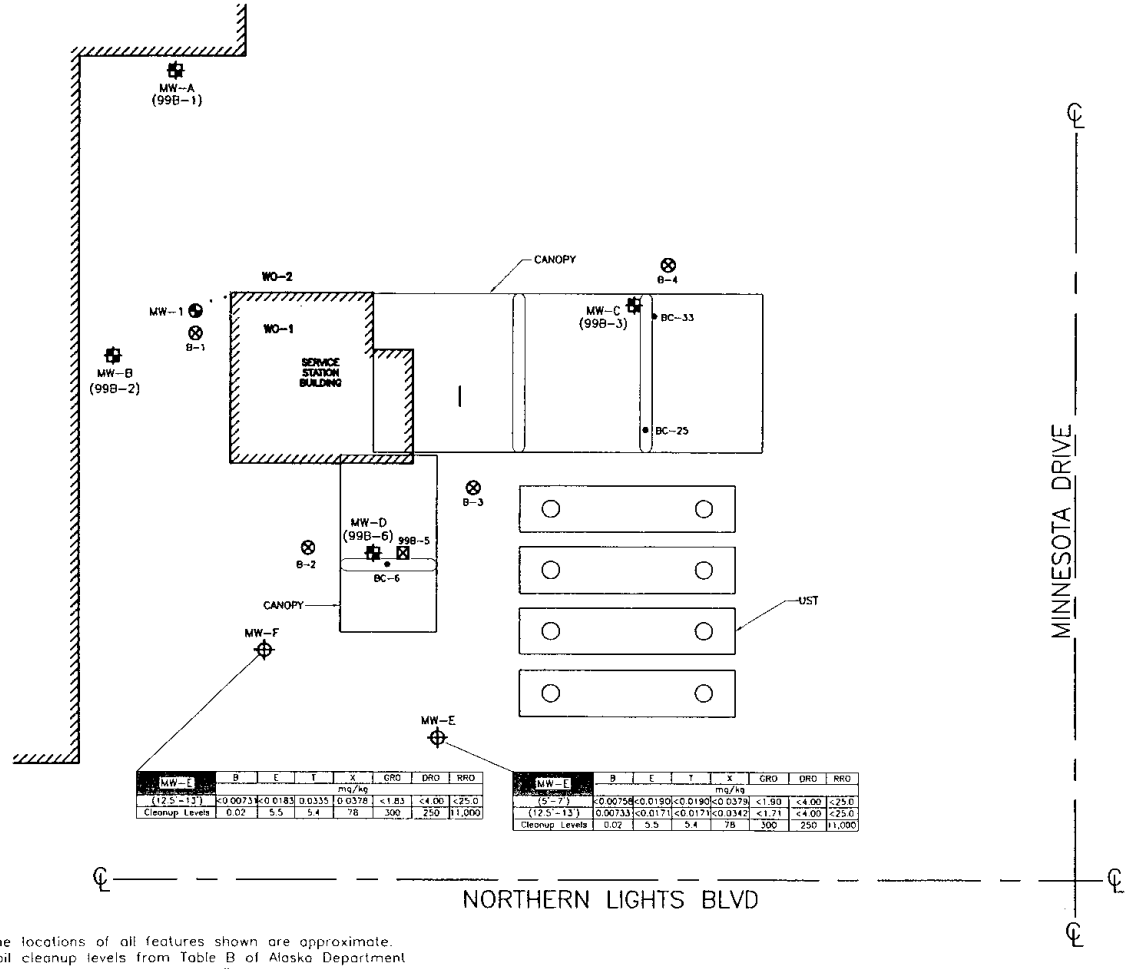
SITE PLAN

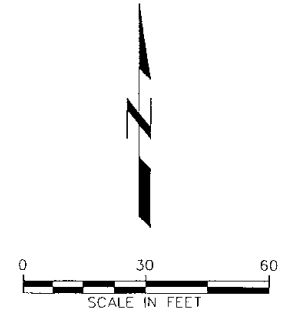
FIGURE 2

P:\Anchorage\0401064\02\AutoCAD\0401-064-02 F2gw.dwg 09/18/01 JJO.DKR



MW-E	B	E	T	X	GRO	DRO	RRO
	mg/kg						
(12.5-13')	<0.0073	<0.0183	0.0335	0.0378	<1.83	<4.00	<25.0
Cleanup Levels	0.02	5.5	5.4	78	300	250	11,000

MW-E	B	E	T	X	GRO	DRO	RRO
	mg/kg						
(5-7')	<0.00758	<0.0190	<0.0190	<0.0379	<1.90	<4.00	<25.0
(12.5-13')	0.00733	<0.0171	<0.0171	<0.0342	<1.71	<4.00	<25.0
Cleanup Levels	0.02	5.5	5.4	78	300	250	11,000



EXPLANATION

BC-6 ●	SOIL SAMPLE BY GEOENGINEERS ON 09/24/96 AND 10/04/96
B-2 ⊗	SOIL BORING BY GEOENGINEERS ON 08/06/97
MW-1 ◕	MONITORING WELL BY GEOENGINEERS ON 12/02/97
99B-5 ⊠	BORING BY GEOENGINEERS ON 10/27/99
MW-C (99B-3) ✿	BORING AND MONITORING WELL BY GEOENGINEERS ON 10/26/99 - 10/28/99
MW-E ⊕	BORING AND MONITORING WELL BY GEOENGINEERS ON 08/07/01
mg/kg	MILLIGRAMS PER KILOGRAM (PARTS PER MILLION)
"<"	ANALYTE NOT DETECTED AT OR ABOVE LABORATORY METHOD REPORTING LIMITS

NOTES:
1. The locations of all features shown are approximate.
2. Soil cleanup levels from Table B of Alaska Department of Environmental Conservation "Oil and Other Hazardous Substances Pollution Control," dated October 28, 2000.

TEXACO FACILITY No. 63-057-0010
1501 NORTHERN LIGHTS BLVD
ANCHORAGE, AK

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CHEMICAL ANALYTICAL RESULTS - SOIL

FIGURE 3

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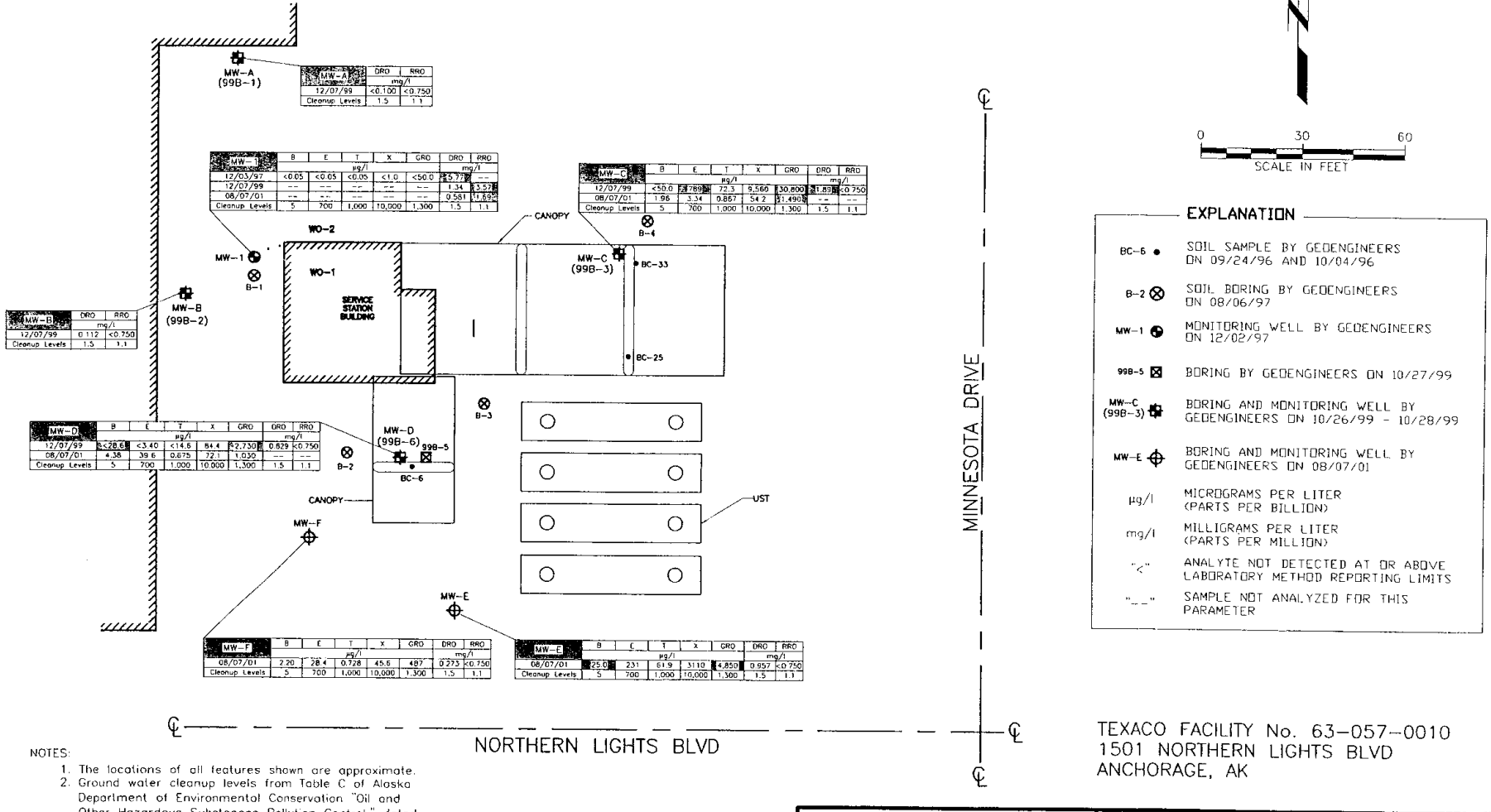

EXPLANATION

BC-6 ●	SOIL SAMPLE BY GEOENGINEERS ON 09/24/96 AND 10/04/96
B-2 ⊗	SOIL BORING BY GEOENGINEERS ON 08/06/97
MW-1 ⊕	MONITORING WELL BY GEOENGINEERS ON 12/02/97
99B-5 ⊠	BORING BY GEOENGINEERS ON 10/27/99
MW-C (99B-3) ⊕	BORING AND MONITORING WELL BY GEOENGINEERS ON 10/26/99 - 10/28/99
MW-E ⊕	BORING AND MONITORING WELL BY GEOENGINEERS ON 08/07/01
µg/l	MICROGRAMS PER LITER (PARTS PER BILLION)
mg/l	MILLIGRAMS PER LITER (PARTS PER MILLION)
"<"	ANALYTE NOT DETECTED AT OR ABOVE LABORATORY METHOD REPORTING LIMITS
"--"	SAMPLE NOT ANALYZED FOR THIS PARAMETER

NOTES:

1. The locations of all features shown are approximate.
2. Ground water cleanup levels from Table C of Alaska Department of Environmental Conservation "Oil and Other Hazardous Substances Pollution Control," dated October 28, 2000.
3. Shading indicates concentration exceeds ADEC ground water cleanup levels.

TEXACO FACILITY No. 63-057-0010
1501 NORTHERN LIGHTS BLVD
ANCHORAGE, AK

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CHEMICAL ANALYTICAL RESULTS – GROUND WATER

FIGURE 4

P:\Anchorage\0401064\02\AutoCAD\0401-064-02 F4ca.dwg 09/18/01 JJO.DKR

ATTACHMENT A

ATTACHMENT A

FIELD EXPLORATIONS

Subsurface soil and ground water conditions at Texaco Service Station #63-057-0010, located at 1501 West Northern Lights Boulevard were investigated through the drilling and installation of two new monitoring wells on August 7, 2001. Soil samples were collected for laboratory analysis at the time of drilling, while representative ground water analytical samples were collected on August 9, 2001. The borings were drilled and the monitoring wells were installed using a CME drill rig, owned and operated by Discovery Drilling of Anchorage, Alaska. Boring logs and well details are provided in this attachment.

FIELD PERSONNEL

Field explorations on August 7 and 9, 2001, were monitored by a GeoEngineers' Anchorage, Alaska, field representative.

SOIL BORING AND SAMPLING

Soil borings were drilled and sampled to a depth of 20.0 feet below ground surface (bgs) during the August 7, 2001 investigation. The borings were drilled using 4 1/4-inch (inside-diameter) hollow-stem auger drilling equipment. The approximate locations of the soil borings are shown on Figure 2 of this report. The boring logs are presented on Figures A-3 and A-4. A key to boring log symbols is included as Figure A-2.

Discovery Drilling steam-cleaned their equipment (i.e., hollow-stem auger, drill bits and center rod) prior to mobilizing for the site. The split-spoon samplers were cleaned prior to each sampling attempt with an Alconox wash, a tap water rinse and a distilled water rinse. The GeoEngineers representative wore clean, disposable, nitrile gloves while handling the sample equipment during sample collection. Each soil sample analyzed is denoted in our boring log with a "CA."

Soil cuttings generated during the drilling of the boring were transferred into 55-gallon steel drums. Two drums containing the cuttings are temporarily being stored on site pending treatment and disposal by Anchorage Soil Recycling.

Soil samples were obtained at 2.5-foot intervals from the borings using a split-spoon sampler (2.4-inch inside-diameter) to the depth of ground water. An additional sample was collected from the base of the borehole. The sampler was driven 24 inches or until refusal by a 340-pound weight falling a vertical distance of 30 inches. The number of blows needed to advance the sampler the final 12 inches is termed the standard penetration resistance. This value is indicated to the left of the corresponding sample notations on the boring log.

Five soil samples from each boring were collected for field screening and transferred to laboratory-supplied jars with Teflon-lined septum caps. Select samples were field preserved with methanol. The samples were then kept cool during temporary storage and transport. Soil samples were transported to North Creek Analytical (NCA) in Bothell, Washington. Chain-of-custody procedures were followed during sample transport to the laboratory.

SOIL CLASSIFICATION AND FIELD SCREENING

Soil encountered was classified visually in general accordance with American Society for Testing and Materials (ASTM) D2488-84, the Standard Practice for Description and Identification of Soils, and the United Soil Classification System (USCS). A key to the soil classification system is included as Figure A-1.

Each soil sample was screened in the field for residual hydrocarbons using visual and water sheen testing methods. Grab samples of soil corresponding to the laboratory samples were also collected in zip-lock plastic bags for subsequent headspace vapor testing using a Photovac MicroTIP photoionization detector (PID) to further guide identification of samples for laboratory analysis. Two of the five soil samples from MW-E and one of the five soil samples from MW-F were submitted for analytical testing based upon review of all field screening results. Field screening results are site- and borehole-specific. The results vary with temperature, moisture content, soil type and type of contamination.

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

Water sheen screening involves placing soil in water and observing the water surface for signs of sheen. Sheen classifications are as follows:

No Sheen (NS)	No visible sheen on water surface.
Slight Sheen (SS)	Light, colorless, dull sheen; spread is irregular, not rapid; sheen dissipates rapidly.
Moderate Sheen (MS)	Light to heavy sheen; may have some color/iridescence; spread is irregular to flowing, may be rapid; few remaining areas of no sheen on water surface.
Heavy Sheen (HS)	Heavy sheen with color/iridescence; spread is rapid; entire water surface may be covered with sheen.

Headspace vapor screening involves placing a soil sample in a plastic sample bag. Air is captured in the bag and the bag is shaken to expose the soil to the air trapped in the bag. The probe of the PID is inserted into the bag and the PID measures the concentration of combustible vapor concentrations in parts per million (ppm). The PID is calibrated to isobutylene and is designed to quantify organic vapors in the range between 0.0 ppm and 10,000 ppm. For this application, the lower limit of instrument accuracy was selected to correspond with the concentration of the calibration gas (100 ppm).

MONITORING WELL CONSTRUCTION

Monitoring wells MW-E and MW-F were completed in the borehole immediately after completion of drilling. Two-inch-diameter, Schedule 40 polyvinyl chloride (PVC) well casing was installed in the borings following completion of drilling. A 10-foot-long section of PVC well screen with 0.020-inch-wide slots was placed at the bottom of the well. Medium sand was placed

approximately 2 feet above the well screen interval followed by approximately 6 1/2 feet of bentonite chips. The monitoring well was completed with fine sand in the annulus surrounding the well casing and a hydrated bentonite seal below the flush-mount surface monument. The bottom of the well screen was completed with an end cap, and the top of the well casing was completed with a locking watertight cap. The flush-mount monument set above the wells was secured in place with cold-asphalt pavement. Construction details for the monitoring wells are included on Figures A-3 and A-4.

A representative of GeoEngineers developed the monitoring well after completion by using a new submersible pump to remove water and sediment through the screened interval. About eight gallons of water were removed from monitoring well MW-E and five gallons from monitoring well MW-F during development. Water from well development was contained in a 55-gallon drum, and was treated and disposed by Alaska Pollution Control on August 24, 2001.

GROUND WATER MONITORING AND SAMPLING

GeoEngineers monitored the ground water levels and collected a representative ground water sample from monitoring wells MW-1, MW-C, MW-D, MW-E and MW-F at the Texaco site on August 9, 2001. A Slope water level indicator was used to measure the depth to ground water in the monitoring wells. All measurements were made relative to the top of well casing. Ground water levels observed during drilling on August 7, 2001, are listed on Figures A-3 and A-4.

GeoEngineers surveyed the top casings of monitoring wells MW-E and MW-F relative to the elevations of existing monitoring wells MW-B and MW-D. Depth to ground water relative to the top of the monitoring well casing was then converted to a relative elevation in order to determine general ground water flow direction.

A new disposable bailer and cord were used to collect the ground water samples in the monitoring wells to minimize the possibility of cross-contamination between samples. The GeoEngineers representative also wore clean, disposable, nitrile gloves to minimize the risk of sample contamination.

The ground water samples were transferred from the bailer to sample containers provided by the analytical laboratory and were kept cool during transport to NCA in Bothell, Washington. Chain-of-custody procedures were followed during sample transport to the laboratory.

SOIL CLASSIFICATION SYSTEM

MAJOR DIVISIONS			GROUP SYMBOL	GROUP NAME
COARSE GRAINED SOILS More Than 50% Retained on No. 200 Sieve	GRAVEL More Than 50% of Coarse Fraction Retained on No. 4 Sieve	CLEAN GRAVEL	GW	WELL-GRADED GRAVEL, FINE TO COARSE GRAVEL
			GP	POORLY-GRADED GRAVEL
		GRAVEL WITH FINES	GM	SILTY GRAVEL
			GC	CLAYEY GRAVEL
	SAND More Than 50% of Coarse Fraction Passes No. 4 Sieve	CLEAN SAND	SW	WELL-GRADED SAND, FINE TO COARSE SAND
			SP	POORLY-GRADED SAND
		SAND WITH FINES	SM	SILTY SAND
			SC	CLAYEY SAND
FINE GRAINED SOILS More Than 50% Passes No. 200 Sieve	SILT AND CLAY Liquid Limit Less Than 50	INORGANIC	ML	SILT
			CL	CLAY
		ORGANIC	OL	ORGANIC SILT, ORGANIC CLAY
	SILT AND CLAY Liquid Limit 50 or More	INORGANIC	MH	SILT OF HIGH PLASTICITY, ELASTIC SILT
			CH	CLAY OF HIGH PLASTICITY, FAT CLAY
		ORGANIC	OH	ORGANIC CLAY, ORGANIC SILT
HIGHLY ORGANIC SOILS			PT	PEAT

NOTES:

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

SOIL MOISTURE MODIFIERS:

Dry - Absence of moisture, dusty, dry to the touch

Moist - Damp, but no visible water

Wet - Visible free water or saturated, usually soil is obtained from below water table

GEI 85-85 Rev. 05/93

Geo Engineers

SOIL CLASSIFICATION SYSTEM

FIGURE A-1

LABORATORY TESTS:

CA Chemical Analysis

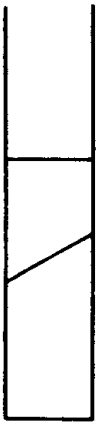
FIELD SCREENING TESTS:

Headspace vapor concentration data given in parts per million

Sheen classification system:

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

SOIL GRAPH:



SM Soil Group Symbol (See Note 2)

Distinct Contact Between Soil Strata

Gradual or Approximate Location of Change Between Soil Strata

Water Level

Bottom of Boring

BLOW-COUNT/SAMPLE DATA:

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

22 Location of relatively undisturbed sample

12 Location of disturbed sample

17 Location of sampling attempt with no recovery

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

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

26 **Location of SPT sampling attempt with no recovery**

Location of grab sample

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

NOTES:

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

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

GEI 121-90

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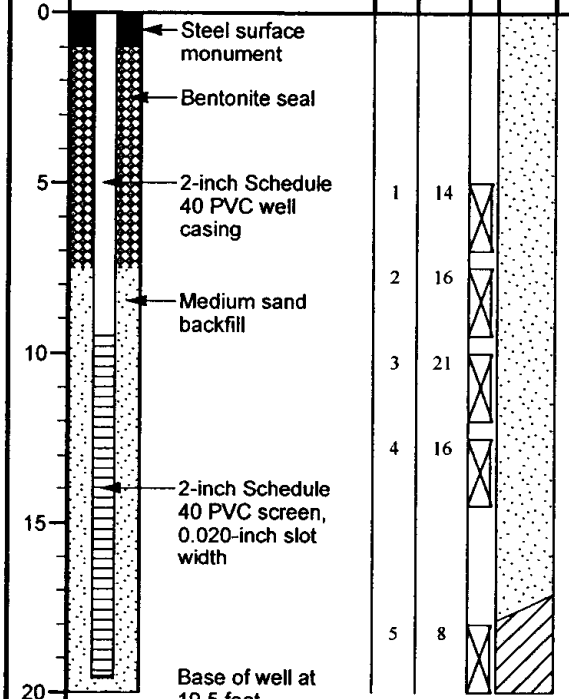
KEY TO BORING LOG SYMBOLS

FIGURE A - 2

Project	Job Number	Location
Texaco - 1501 W. Northern Lights Blvd.	0401-064-02	0033 Anchorage, Alaska

Date Drilled	08/07/01	Logged By	DKR	Contractor	Discovery Drilling
Drill Method	CME-75 Truck-Mounted Rig	Equipment	3.25-inch Hollow Stem Auger	Drill Bit	Carbide Tooth
Sample Method	2.4" ID Split Spoon	Hammer Data	340-lb Automatic	X-coordinate: / Y-coordinate:	Not Determined / Not Determined
Total Depth (ft)	20	Elevation (ft)	98.08	Datum: / System:	Not Determined / Not Determined
Total Well Depth (ft)	19.5	Monument Elevation / Stickup (ft)	98.08 / 0.00	Casing Elevation / Stickup (ft)	97.66 / -0.42



Sample No.	Blows per foot	Sample	Graphic Log	USCS Group Symbol	Material Description	Headspace Vapor (ppm)	Sheen	Other Tests And Notes
1	14			SP	Brown fine to coarse sand with silt (medium dense, moist)	0.0	SS	CA
2	16				Brown fine to coarse sand with silt (medium dense, moist)	0.0	NS	
3	21				Brown fine to coarse sand with silt (medium dense, moist)	0.0	NS	
4	16				Brown fine to coarse sand with gravel (medium dense, wet) ▽ Ground water encountered at 12.71 feet	0.0	NS	CA
5	8			CL	Gray silty clay (medium stiff to stiff, wet)	0.0	NS	
					Boring completed at 20.0 feet on 08/07/01			

DEPTH IN FEET: 0, 5, 10, 15, 20, 25, 30, 35

GEI WELL LOG 04010642.GPJ GEI CORP.GDT 9/26/01 0401-064-02

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LOG OF MONITORING WELL MW-E

FIGURE A-3

Project	Job Number	Location
Texaco - 1501 W. Northern Lights Blvd.	0401-064-02	Anchorage, Alaska

Date Drilled	08/07/01	Logged By	DKR	Contractor	Discovery Drilling
Drill Method	CME-75 Truck-Mounted Rig	Equipment	3.25-inch Hollow Stem Auger	Drill Bit	Carbide Tooth
Sample Method	2.4" ID Split Spoon	Hammer Data	340-lb Automatic	X-coordinate: Y-coordinate:	Not Determined Not Determined
Total Depth (ft)	20	Elevation (ft)	98.6	Datum: System:	Not Determined Not Determined
Total Well Depth (ft)	17.5	Monument Elevation Stickup (ft)	98.6 0.00	Casing Elevation Stickup (ft)	98.14 -0.46

DEPTH IN FEET	WELL SCHEMATIC	Sample No.	Blows per foot	Sample	Graphic Log	USCS Group Symbol	Material Description	Headspace Vapor (ppm)	Sheen	Other Tests And Notes	DEPTH IN FEET
0	Steel surface monument Bentonite seal					SP					0
5	2-inch Schedule 40 PVC well casing	1	18				Brown fine to coarse sand with silt and gravel (medium dense, moist)	0.0	NS		5
	Medium sand backfill	2	23				Brown fine to coarse sand with silt and gravel (medium dense, moist)	0.0	NS		
10		3	14				Brown fine to medium sand with trace silt (medium dense, moist)	0.0	NS		10
	2-inch Schedule 40 PVC screen, 0.020-inch slot width	4	23				Brown fine to coarse sand with gravel and silt (medium dense, wet) ▽ Ground water encountered at 13.21 feet	0.0	NS	CA	
15	Base of well at 17.5 feet	5	14			CL	Gray silty clay (stiff, wet)	0.0	NS		15
20							Boring completed at 20.0 feet on 08/07/01				20
25											25
30											30
35											35

GEI WELL LOG 04010642.GPJ GEI_CORP.GDT 9/26/01 0401-064-02

Geo Engineers

LOG OF MONITORING WELL MW-F

FIGURE A-4

ATTACHMENT B

ATTACHMENT B

CHEMICAL ANALYTICAL PROGRAM

SAMPLES

Chain-of-custody procedures were followed during the transport of the field samples to the accredited analytical laboratory. The samples were held in cold storage pending extraction and/or analysis. The analytical results and quality control records are included in this attachment.

ANALYTICAL DATA REVIEW

The laboratory maintains an internal quality assurance (QA) program as documented in its laboratory quality assurance manual. The laboratory uses a combination of blanks, surrogate recoveries, duplicates, matrix spike recoveries, matrix spike duplicate recoveries, blank spike recoveries and blank spike duplicate recoveries to evaluate the analytical results. The laboratory also uses data quality goals for individual chemicals or groups of chemicals based on the long-term performance of the test methods. The data quality goals were included in the laboratory reports. The laboratory compared each group of samples with the existing data quality goals and noted any exceptions in the laboratory report. Any data quality exceptions documented by the accredited laboratory were reviewed by GeoEngineers and are addressed in the data quality exception section of this attachment.

DATA QUALITY EXCEPTION SUMMARY

No significant data quality exceptions were noted in the laboratory report or during our review. Based on our data quality review, it is our opinion that the analytical data are of acceptable quality for their intended use.

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Routing ☐ ☐
☐ ☐ ☐
File 0401-004-02

16 August 2001

Jamie Oakley
Geo Engineers - Alaska
4951 Eagle Street
Anchorage, AK 99503-7432

RE: Equilon SAP #120686

Enclosed are the results of analyses for samples received by the laboratory on 08/09/01 09:45. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

S. Wo

Scott A. Woerman
Project Manager

COPY

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0038

Geo Engineers - Alaska	Project: Equilon SAP #120686	
4951 Eagle Street	Project Number: 0401-064-02	**Reported:**
Anchorage AK, 99503-7432	Project Manager: Jamie Oakley	08/16/01 14:23

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
MW-E (5'-7')	B1H0250-01	Soil	08/07/01 12:10	08/09/01 09:45
MW-E (12.5'-13')	B1H0250-02	Soil	08/07/01 12:25	08/09/01 09:45
MW-F (12.5'-13.5')	B1H0250-03	Soil	08/07/01 14:00	08/09/01 09:45
Trip Blank	B1H0250-04	Soil	08/07/01 12:00	08/09/01 09:45

North Creek Analytical - Bothell

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Geo Engineers - Alaska	Project: Equilon SAP #120686	
4951 Eagle Street	Project Number: 0401-064-02	**Reported:**
Anchorage AK, 99503-7432	Project Manager: Jamie Oakley	08/16/01 14:23

Gasoline Hydrocarbons (n-Hexane to <n-Decane) and BTEX by AK101

North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
MW-E (5'-7') (B1H0250-01) Soil Sampled: 08/07/01 12:10 Received: 08/09/01 09:45									
Gasoline Range Hydrocarbons	ND	1.90	mg/kg dry	1	1H14032	08/14/01	08/14/01	AK 101	
Benzene	ND	0.00758	"	"	"	"	"	"	
Toluene	ND	0.0190	"	"	"	"	"	"	
Ethylbenzene	ND	0.0190	"	"	"	"	"	"	
Xylenes (total)	ND	0.0379	"	"	"	"	"	"	
Surrogate: 4-BFB (FID)	*76.4 %*	*60-120*			"	"	"	"	
Surrogate: a,a,a-TFT (FID)	*110 %*	*50-150*			"	"	"	"	
Surrogate: 4-BFB (PID)	*80.1 %*	*54-123*			"	"	"	"	
Surrogate: a,a,a-TFT (PID)	*113 %*	*50-150*			"	"	"	"	
MW-E (12.5'-13') (B1H0250-02) Soil Sampled: 08/07/01 12:25 Received: 08/09/01 09:45									
Gasoline Range Hydrocarbons	ND	1.71	mg/kg dry	1	1H14032	08/14/01	08/14/01	AK 101	
Benzene	**0.00733**	0.00683	"	"	"	"	"	"	I-06
Toluene	ND	0.0171	"	"	"	"	"	"	
Ethylbenzene	ND	0.0171	"	"	"	"	"	"	
Xylenes (total)	ND	0.0342	"	"	"	"	"	"	
Surrogate: 4-BFB (FID)	*76.0 %*	*60-120*			"	"	"	"	
Surrogate: a,a,a-TFT (FID)	*101 %*	*50-150*			"	"	"	"	
Surrogate: 4-BFB (PID)	*79.8 %*	*54-123*			"	"	"	"	
Surrogate: a,a,a-TFT (PID)	*104 %*	*50-150*			"	"	"	"	
MW-F (12.5'-13.5') (B1H0250-03) Soil Sampled: 08/07/01 14:00 Received: 08/09/01 09:45									
Gasoline Range Hydrocarbons	ND	1.83	mg/kg dry	1	1H14032	08/14/01	08/14/01	AK 101	
Benzene	ND	0.00731	"	"	"	"	"	"	
Toluene	**0.0335**	0.0183	"	"	"	"	"	"	
Ethylbenzene	ND	0.0183	"	"	"	"	"	"	
Xylenes (total)	**0.0378**	0.0365	"	"	"	"	"	"	
Surrogate: 4-BFB (FID)	*74.5 %*	*60-120*			"	"	"	"	
Surrogate: a,a,a-TFT (FID)	*108 %*	*50-150*			"	"	"	"	
Surrogate: 4-BFB (PID)	*77.7 %*	*54-123*			"	"	"	"	
Surrogate: a,a,a-TFT (PID)	*110 %*	*50-150*			"	"	"	"	

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0040

Geo Engineers - Alaska	Project: Equilon SAP #120686	
4951 Eagle Street	Project Number: 0401-064-02	**Reported:**
Anchorage AK, 99503-7432	Project Manager: Jamie Oakley	08/16/01 14:23

Gasoline Hydrocarbons (n-Hexane to <n-Decane) and BTEX by AK101

North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Trip Blank (B1H0250-04) Soil Sampled: 08/07/01 12:00 Received: 08/09/01 09:45									
Gasoline Range Hydrocarbons	ND	2.55	mg/kg wet	1	1H14032	08/14/01	08/14/01	AK 101	
Benzene	ND	0.0102	"	"	"	"	"	"	
Toluene	ND	0.0255	"	"	"	"	"	"	
Ethylbenzene	ND	0.0255	"	"	"	"	"	"	
Xylenes (total)	ND	0.0510	"	"	"	"	"	"	
Surrogate: 4-BFB (FID)	*74.3 %*	*60-120*			"	"	"	"	
Surrogate: a,a,a-TFT (FID)	*117 %*	*50-150*			"	"	"	"	
Surrogate: 4-BFB (PID)	*77.1 %*	*54-123*			"	"	"	"	
Surrogate: a,a,a-TFT (PID)	*120 %*	*50-150*			"	"	"	"	

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Geo Engineers - Alaska	Project: Equilon SAP #120686	
4951 Eagle Street	Project Number: 0401-064-02	**Reported:**
Anchorage AK, 99503-7432	Project Manager: Jamie Oakley	08/16/01 14:23

Diesel Hydrocarbons (C10-C25) and Heavy Oil (C25-C36) by AK102 and AK103
North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
MW-E (5'-7') (B1H0250-01) Soil Sampled: 08/07/01 12:10 Received: 08/09/01 09:45									
Diesel Range Hydrocarbons	ND	4.00	mg/kg dry	1	1H14006	08/14/01	08/16/01	AK102/103	
Residual Range Organics	ND	25.0	"	"	"	"	"	"	
Surrogate: 2-FBP	*91.0 %*	*50-150*			"	"	"	"	
Surrogate: Octacosane	*92.5 %*	*50-150*			"	"	"	"	
MW-E (12.5'-13') (B1H0250-02) Soil Sampled: 08/07/01 12:25 Received: 08/09/01 09:45									
Diesel Range Hydrocarbons	ND	4.00	mg/kg dry	1	1H14006	08/14/01	08/16/01	AK102/103	
Residual Range Organics	ND	25.0	"	"	"	"	"	"	
Surrogate: 2-FBP	*85.5 %*	*50-150*			"	"	"	"	
Surrogate: Octacosane	*89.0 %*	*50-150*			"	"	"	"	
MW-F (12.5'-13.5') (B1H0250-03) Soil Sampled: 08/07/01 14:00 Received: 08/09/01 09:45									
Diesel Range Hydrocarbons	ND	4.00	mg/kg dry	1	1H14006	08/14/01	08/16/01	AK102/103	
Residual Range Organics	ND	25.0	"	"	"	"	"	"	
Surrogate: 2-FBP	*85.8 %*	*50-150*			"	"	"	"	
Surrogate: Octacosane	*87.3 %*	*50-150*			"	"	"	"	

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Geo Engineers - Alaska	Project: Equilon SAP #120686	
4951 Eagle Street	Project Number: 0401-064-02	**Reported:**
Anchorage AK, 99503-7432	Project Manager: Jamie Oakley	08/16/01 14:23

Physical Parameters by APHA/ASTM/EPA Methods
North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
MW-E (5'-7') (B1H0250-01) Soil Sampled: 08/07/01 12:10 Received: 08/09/01 09:45									
Dry Weight	95.3	1.00	%	1	1H14026	08/14/01	08/15/01	BSOPSPL003R07	
MW-E (12.5'-13') (B1H0250-02) Soil Sampled: 08/07/01 12:25 Received: 08/09/01 09:45									
Dry Weight	89.4	1.00	%	1	1H14026	08/14/01	08/15/01	BSOPSPL003R07	
MW-F (12.5'-13.5') (B1H0250-03) Soil Sampled: 08/07/01 14:00 Received: 08/09/01 09:45									
Dry Weight	95.2	1.00	%	1	1H14026	08/14/01	08/15/01	BSOPSPL003R07	

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0043

Geo Engineers - Alaska	Project: Equilon SAP #120686	
4951 Eagle Street	Project Number: 0401-064-02	**Reported:**
Anchorage AK, 99503-7432	Project Manager: Jamie Oakley	08/16/01 14:23

Gasoline Hydrocarbons (n-Hexane to <n-Decane) and BTEX by AK101 - Quality Control
North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1H14032: Prepared 08/14/01 Using EPA 5030B (MeOH)										
Blank (1H14032-BLK1)										
Gasoline Range Hydrocarbons	ND	2.50	mg/kg							
Benzene	ND	0.0100	"							
Toluene	ND	0.0250	"							
Ethylbenzene	ND	0.0250	"							
Xylenes (total)	ND	0.0500	"							
Surrogate: 4-BFB (FID)	*1.76*		"	*2.40*		*73.3*	*60-120*			
Surrogate: a,a,a-TFT (FID)	*1.15*		"	*1.00*		*115*	*50-150*			
Surrogate: 4-BFB (PID)	*1.80*		"	*2.40*		*75.0*	*54-123*			
Surrogate: a,a,a-TFT (PID)	*1.16*		"	*1.00*		*116*	*50-150*			
LCS (1H14032-BS1)										
Gasoline Range Hydrocarbons	10.8	2.50	mg/kg	12.5		86.4	60-120			
Surrogate: 4-BFB (FID)	*1.95*		"	*2.40*		*81.2*	*60-120*			
Surrogate: a,a,a-TFT (FID)	*1.17*		"	*1.00*		*117*	*50-150*			
LCS (1H14032-BS2)										
Benzene	0.230	0.0100	mg/kg	0.250		92.0	80-120			
Toluene	0.252	0.0250	"	0.250		101	80-120			
Ethylbenzene	0.257	0.0250	"	0.250		103	80-120			
Xylenes (total)	0.780	0.0500	"	0.750		104	80-120			
Surrogate: 4-BFB (PID)	*1.92*		"	*2.40*		*80.0*	*54-123*			
Surrogate: a,a,a-TFT (PID)	*1.18*		"	*1.00*		*118*	*50-150*			
LCS Dup (1H14032-BSD1)										
Gasoline Range Hydrocarbons	11.0	2.50	mg/kg	12.5		88.0	60-120	1.83	20	
Surrogate: 4-BFB (FID)	*1.94*		"	*2.40*		*80.8*	*60-120*			
Surrogate: a,a,a-TFT (FID)	*1.16*		"	*1.00*		*116*	*50-150*			

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0044

Geo Engineers - Alaska	Project: Equilon SAP #120686	
4951 Eagle Street	Project Number: 0401-064-02	**Reported:**
Anchorage AK, 99503-7432	Project Manager: Jamie Oakley	08/16/01 14:23

Gasoline Hydrocarbons (n-Hexane to <n-Decane) and BTEX by AK101 - Quality Control
North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1H14032: Prepared 08/14/01 Using EPA 5030B (MeOH)										
LCS Dup (1H14032-BSD2)										
Benzene	0.225	0.0100	mg/kg	0.250		90.0	80-120	2.20	40	
Toluene	0.240	0.0250	"	0.250		96.0	80-120	4.88	40	
Ethylbenzene	0.251	0.0250	"	0.250		100	80-120	2.36	40	
Xylenes (total)	0.758	0.0500	"	0.750		101	80-120	2.86	40	
Surrogate: 4-BFB (PID)	*1.84*		"	*2.40*		*76.7*	*54-123*			
Surrogate: a,a,a-TFT (PID)	*1.16*		"	*1.00*		*116*	*50-150*			

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Geo Engineers - Alaska	Project: Equilon SAP #120686	
4951 Eagle Street	Project Number: 0401-064-02	**Reported:**
Anchorage AK, 99503-7432	Project Manager: Jamie Oakley	08/16/01 14:23

Diesel Hydrocarbons (C10-C25) and Heavy Oil (C25-C36) by AK102 and AK103 - Quality Control

North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1H14006: Prepared 08/14/01 Using EPA 3550B										
Blank (1H14006-BLK1)										
Diesel Range Hydrocarbons	ND	4.00	mg/kg							
Residual Range Organics	ND	25.0	"							
Surrogate: 2-FBP	*11.4*		"	*12.8*		*89.1*	*50-150*			
Surrogate: Octacosane	*11.7*		"	*12.8*		*91.4*	*50-150*			
LCS (1H14006-BS1)										
Diesel Range Hydrocarbons	67.7	4.00	mg/kg	80.0		84.6	60-120			
Surrogate: 2-FBP	*12.2*		"	*12.8*		*95.3*	*50-150*			
LCS (1H14006-BS2)										
Residual Range Organics	72.6	25.0	mg/kg	80.0		90.8	60-100			
Surrogate: Octacosane	*13.2*		"	*12.8*		*103*	*50-150*			
LCS Dup (1H14006-BSD1)										
Diesel Range Hydrocarbons	65.8	4.00	mg/kg	80.0		82.2	60-120	2.85	20	
Surrogate: 2-FBP	*11.9*		"	*12.8*		*93.0*	*50-150*			
LCS Dup (1H14006-BSD2)										
Residual Range Organics	76.3	25.0	mg/kg	80.0		95.4	60-100	4.97	20	
Surrogate: Octacosane	*14.1*		"	*12.8*		*110*	*50-150*			

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

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Geo Engineers - Alaska	Project: Equilon SAP #120686	
4951 Eagle Street	Project Number: 0401-064-02	**Reported:**
Anchorage AK, 99503-7432	Project Manager: Jamie Oakley	08/16/01 14:23

Physical Parameters by APHA/ASTM/EPA Methods - Quality Control
North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1H14026: Prepared 08/14/01 Using Dry Weight										
Blank (1H14026-BLK1)										
Dry Weight	100	1.00	%							

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0047

Geo Engineers - Alaska	Project: Equilon SAP #120686	
4951 Eagle Street	Project Number: 0401-064-02	**Reported:**
Anchorage AK, 99503-7432	Project Manager: Jamie Oakley	08/16/01 14:23

Notes and Definitions

I-06	The analyte concentration may be artificially elevated due to coeluting compounds or components.
DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit
NR	Not Reported
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference

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CHAIN OF CUSTODY REPORT

Work Order #: B1H0250

CLIENT: Equiva

REPORT TO: Jamie Oakley w/ GeoEngineers

ADDRESS: 4957 Eagle St.
Anchorage, AK 99503

PHONE: (907) 561-3478 FAX: (907)561-5123

INVOICE TO: Attn: Tony Palagyi
Equiva, LLC
1062 NE 38th Place
Kirkland, WA 98033

P.O. NUMBER:

PROJECT NAME: Texaco 63-057-0010

PROJECT NUMBER: 0401-064-02

SAMPLED BY: JJO/DKR

TURNAROUND REQUEST in Business Days*

Organic & Inorganic Analyses: 10 | 7 | 5 | 4 | 3 | 2 | 1 | <1 (STD.)

Petroleum Hydrocarbon Analyses: X | 4 | 3 | 2 | 1 | <1 (STD.)

OTHER — Please Specify

*Turnaround Requests less than standard may incur Rush Charges.

CLIENT SAMPLE IDENTIFICATION	SAMPLING DATE/TIME	BETX / 8260 AK 101	DRO / RRO AK 102/103	MATRIX (W, S, O)	# OF CONT.	COMMENTS	NCA WC ID
1. MW-E (5'-7')	8/7/01 - 1210	X	X	S	2		-01
2. MW-E (12.5'-13')	8/7/01 - 1225	X	X	S	2		-02
3. MW-F (12.5'-13.5')	8/7/01 - 1400	X	X	S	2		-03
4. Trip Blank	8/7/01	X		S	1		-04
5.							
6.							
7.							
8.							
9.							
10.							
11.							
12.							
13.							
14.							
15.							

REQUESTED ANALYSES

0048

RELINQUISHED BY: [signature] DATE: 8/8/01
PRINT NAME: JAMIE OAKLEY FIRM: GEI TIME: 1335

RECEIVED BY: [signature] DATE: 8/9/01
PRINT NAME: FIRM: NCA TIME: 0945

RELINQUISHED BY: DATE:
PRINT NAME: FIRM: TIME:

RECEIVED BY: DATE:
PRINT NAME: TIME:

ADDITIONAL REMARKS: Samples were not @2-6C Upon Receipt

TEMP: 7

COC REV 3/00 GE

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0049

24 August 2001

GeoEngineers
ANCHORAGE

SEP 10 2001

Routing ☐ ☐ ☐
☐ ☐ ☐
File

Jamie Oakley
Geo Engineers - Alaska
4951 Eagle Street
Anchorage, AK 99503-7432

RE: Equilon SAP #120686

Enclosed are the results of analyses for samples received by the laboratory on 08/10/01 10:40. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

S. Wo

COPY

Scott A. Woerman
Project Manager

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0050

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Geo Engineers - Alaska	Project: Equilon SAP #120686	
4951 Eagle Street	Project Number: 0401-064-02	**Reported:**
Anchorage AK, 99503-7432	Project Manager: Jamie Oakley	08/24/01 19:10

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
MW-1	B1H0281-01	Water	08/09/01 13:00	08/10/01 10:40
MW-C	B1H0281-02	Water	08/09/01 12:30	08/10/01 10:40
MW-D	B1H0281-03	Water	08/09/01 12:50	08/10/01 10:40
MW-E	B1H0281-04	Water	08/09/01 13:40	08/10/01 10:40
MW-F	B1H0281-05	Water	08/09/01 13:05	08/10/01 10:40
DUPLICATE	B1H0281-06	Water	08/09/01 12:00	08/10/01 10:40
TRIPBLANKS	B1H0281-07	Water	08/09/01 12:00	08/10/01 10:40

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0051

Geo Engineers - Alaska	Project: Equilon SAP #120686	
4951 Eagle Street	Project Number: 0401-064-02	**Reported:**
Anchorage AK, 99503-7432	Project Manager: Jamie Oakley	08/24/01 19:10

Gasoline Hydrocarbons (n-Hexane to <n-Decane) and BTEX by AK101
North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
MW-C (B1H0281-02) Water Sampled: 08/09/01 12:30 Received: 08/10/01 10:40									
Gasoline Range Hydrocarbons	**1490**	50.0	ug/l	1	1H20007	08/20/01	08/20/01	AK 101	
Benzene	**1.96**	0.200	"	"	"	"	"	"	I-06
Toluene	**0.867**	0.500	"	"	"	"	"	"	I-06
Ethylbenzene	**3.34**	0.500	"	"	"	"	"	"	
Xylenes (total)	**54.2**	1.00	"	"	"	"	"	"	
Surrogate: 4-BFB (FID)	*183 %*	*60-120*			"	"	"	"	*S-04*
Surrogate: 4-BFB (PID)	*114 %*	*60-120*			"	"	"	"	
MW-D (B1H0281-03) Water Sampled: 08/09/01 12:50 Received: 08/10/01 10:40									
Gasoline Range Hydrocarbons	**1030**	50.0	ug/l	1	1H20007	08/20/01	08/20/01	AK 101	
Benzene	**4.38**	0.200	"	"	"	"	"	"	
Toluene	**0.675**	0.500	"	"	"	"	"	"	I-06
Ethylbenzene	**39.6**	0.500	"	"	"	"	"	"	
Xylenes (total)	**72.1**	1.00	"	"	"	"	"	"	
Surrogate: 4-BFB (FID)	*137 %*	*60-120*			"	"	"	"	*S-04*
Surrogate: 4-BFB (PID)	*99.6 %*	*60-120*			"	"	"	"	
MW-E (B1H0281-04) Water Sampled: 08/09/01 13:40 Received: 08/10/01 10:40									
Gasoline Range Hydrocarbons	**4850**	50.0	ug/l	1	1H20007	08/20/01	08/20/01	AK 101	
Benzene	**25.0**	0.200	"	"	"	"	"	"	
Toluene	**61.9**	0.500	"	"	"	"	"	"	
Ethylbenzene	**231**	10.0	"	20	"	"	08/20/01	"	
Xylenes (total)	**3110**	20.0	"	"	"	"	"	"	
Surrogate: 4-BFB (FID)	*181 %*	*60-120*			"	"	*08/20/01*	"	*S-04*
Surrogate: 4-BFB (PID)	*131 %*	*60-120*			"	"	"	"	*S-04*

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0052

Geo Engineers - Alaska	Project: Equilon SAP #120686	
4951 Eagle Street	Project Number: 0401-064-02	**Reported:**
Anchorage AK, 99503-7432	Project Manager: Jamie Oakley	08/24/01 19:10

Gasoline Hydrocarbons (n-Hexane to <n-Decane) and BTEX by AK101

North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
MW-F (B1H0281-05) Water Sampled: 08/09/01 13:05 Received: 08/10/01 10:40									
Gasoline Range Hydrocarbons	**487**	50.0	ug/l	1	1H20007	08/20/01	08/20/01	AK 101	
Benzene	**2.20**	0.200	"	"	"	"	"	"	
Toluene	**0.728**	0.500	"	"	"	"	"	"	I-06
Ethylbenzene	**28.4**	0.500	"	"	"	"	"	"	
Xylenes (total)	**45.6**	1.00	"	"	"	"	"	"	
Surrogate: 4-BFB (FID)	*124 %*	*60-120*			"	"	"	"	*S-04*
Surrogate: 4-BFB (PID)	*107 %*	*60-120*			"	"	"	"	
DUPLICATE (B1H0281-06) Water Sampled: 08/09/01 12:00 Received: 08/10/01 10:40									
Gasoline Range Hydrocarbons	**3440**	125	ug/l	2.5	1H20007	08/20/01	08/20/01	AK 101	
Benzene	**5.54**	0.500	"	"	"	"	"	"	I-06
Toluene	**1.98**	1.25	"	"	"	"	"	"	I-06
Ethylbenzene	**7.70**	1.25	"	"	"	"	"	"	
Xylenes (total)	**107**	2.50	"	"	"	"	"	"	
Surrogate: 4-BFB (FID)	*145 %*	*60-120*			"	"	"	"	*S-04*
Surrogate: 4-BFB (PID)	*122 %*	*60-120*			"	"	"	"	*S-04*
TRIPBLANKS (B1H0281-07) Water Sampled: 08/09/01 12:00 Received: 08/10/01 10:40									
Gasoline Range Hydrocarbons	ND	50.0	ug/l	1	1H20007	08/20/01	08/20/01	AK 101	
Benzene	ND	0.200	"	"	"	"	"	"	
Toluene	ND	0.500	"	"	"	"	"	"	
Ethylbenzene	ND	0.500	"	"	"	"	"	"	
Xylenes (total)	ND	1.00	"	"	"	"	"	"	
Surrogate: 4-BFB (FID)	*87.7 %*	*60-120*			"	"	"	"	
Surrogate: 4-BFB (PID)	*91.5 %*	*60-120*			"	"	"	"	

North Creek Analytical - Bothell

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Geo Engineers - Alaska	Project: Equilon SAP #120686	
4951 Eagle Street	Project Number: 0401-064-02	**Reported:**
Anchorage AK, 99503-7432	Project Manager: Jamie Oakley	08/24/01 19:10

Diesel Hydrocarbons (C10-C25) and Heavy Oil (C25-C36) by AK102 and AK103
North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
MW-1 (B1H0281-01) Water	**Sampled: 08/09/01 13:00**		**Received: 08/10/01 10:40**						
Diesel Range Hydrocarbons	**0.581**	0.100	mg/l	1	1H13012	08/13/01	08/21/01	AK102/103	D-09
Residual Range Organics	**1.69**	0.750	"	"	"	"	"	"	
Surrogate: 2-FBP	*80.7 %*	*50-150*			"	"	"	"	
Surrogate: Octacosane	*76.4 %*	*50-150*			"	"	"	"	
MW-E (B1H0281-04) Water	**Sampled: 08/09/01 13:40**		**Received: 08/10/01 10:40**						
Diesel Range Hydrocarbons	**0.957**	0.100	mg/l	1	1H13012	08/13/01	08/21/01	AK102/103	D-08
Residual Range Organics	ND	0.750	"	"	"	"	"	"	
Surrogate: 2-FBP	*87.8 %*	*50-150*			"	"	"	"	
Surrogate: Octacosane	*71.7 %*	*50-150*			"	"	"	"	
MW-F (B1H0281-05) Water	**Sampled: 08/09/01 13:05**		**Received: 08/10/01 10:40**						
Diesel Range Hydrocarbons	**0.273**	0.100	mg/l	1	1H13012	08/13/01	08/21/01	AK102/103	D-08
Residual Range Organics	ND	0.750	"	"	"	"	"	"	
Surrogate: 2-FBP	*79.4 %*	*50-150*			"	"	"	"	
Surrogate: Octacosane	*63.7 %*	*50-150*			"	"	"	"	

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Scott A. Woerman, Project Manager

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0054

Geo Engineers - Alaska	Project: Equilon SAP #120686	
4951 Eagle Street	Project Number: 0401-064-02	**Reported:**
Anchorage AK, 99503-7432	Project Manager: Jamie Oakley	08/24/01 19:10

Polynuclear Aromatic Compounds by GC/MS with Selected Ion Monitoring

North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
MW-1 (B1H0281-01) Water Sampled: 08/09/01 13:00 Received: 08/10/01 10:40									
Acenaphthene	ND	0.100	ug/l	1	1H12002	08/12/01	08/15/01	GCMS-SIM	
Acenaphthylene	ND	0.100	"	"	"	"	"	"	
Anthracene	ND	0.100	"	"	"	"	"	"	
Benzo (a) anthracene	ND	0.100	"	"	"	"	"	"	
Benzo (a) pyrene	ND	0.100	"	"	"	"	"	"	
Benzo (b) fluoranthene	ND	0.100	"	"	"	"	"	"	
Benzo (ghi) perylene	ND	0.100	"	"	"	"	"	"	
Benzo (k) fluoranthene	ND	0.100	"	"	"	"	"	"	
Chrysene	ND	0.100	"	"	"	"	"	"	
Dibenz (a,h) anthracene	ND	0.100	"	"	"	"	"	"	
Fluoranthene	ND	0.100	"	"	"	"	"	"	
Fluorene	ND	0.100	"	"	"	"	"	"	
Indeno (1,2,3-cd) pyrene	ND	0.100	"	"	"	"	"	"	
Naphthalene	ND	0.100	"	"	"	"	"	"	
Phenanthrene	ND	0.100	"	"	"	"	"	"	
Pyrene	ND	0.100	"	"	"	"	"	"	
Surrogate: 2-FBP	*86.2 %*	*14-115*			"	"	"	"	
Surrogate: Nitrobenzene-d5	*76.4 %*	*10-133*			"	"	"	"	
Surrogate: p-Terphenyl-d14	*47.7 %*	*22-124*			"	"	"	"	
MW-E (B1H0281-04) Water Sampled: 08/09/01 13:40 Received: 08/10/01 10:40									
Acenaphthene	ND	0.100	ug/l	1	1H12002	08/12/01	08/15/01	GCMS-SIM	
Acenaphthylene	ND	0.100	"	"	"	"	"	"	
Anthracene	ND	0.100	"	"	"	"	"	"	
Benzo (a) anthracene	ND	0.100	"	"	"	"	"	"	
Benzo (a) pyrene	ND	0.100	"	"	"	"	"	"	
Benzo (b) fluoranthene	ND	0.100	"	"	"	"	"	"	
Benzo (ghi) perylene	ND	0.100	"	"	"	"	"	"	
Benzo (k) fluoranthene	ND	0.100	"	"	"	"	"	"	
Chrysene	ND	0.100	"	"	"	"	"	"	
Dibenz (a,h) anthracene	ND	0.100	"	"	"	"	"	"	
Fluoranthene	ND	0.100	"	"	"	"	"	"	
Fluorene	ND	0.100	"	"	"	"	"	"	
Indeno (1,2,3-cd) pyrene	ND	0.100	"	"	"	"	"	"	
Naphthalene	**8.29**	0.100	"	"	"	"	"	"	
Phenanthrene	ND	0.100	"	"	"	"	"	"	
Pyrene	ND	0.100	"	"	"	"	"	"	
Surrogate: 2-FBP	*78.8 %*	*14-115*			"	"	"	"	

North Creek Analytical - Bothell

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0055

Geo Engineers - Alaska	Project: Equilon SAP #120686	
4951 Eagle Street	Project Number: 0401-064-02	**Reported:**
Anchorage AK, 99503-7432	Project Manager: Jamie Oakley	08/24/01 19:10

Polynuclear Aromatic Compounds by GC/MS with Selected Ion Monitoring

North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
MW-E (B1H0281-04) Water	**Sampled: 08/09/01 13:40**		**Received: 08/10/01 10:40**						
Surrogate: Nitrobenzene-d5	*75.7 %*	*10-133*			*1H12002*	*08/12/01*	*08/15/01*	*GCMS-SIM*	
Surrogate: p-Terphenyl-d14	*28.7 %*	*22-124*			"	"	"	"	
MW-F (B1H0281-05) Water	**Sampled: 08/09/01 13:05**		**Received: 08/10/01 10:40**						
Acenaphthene	ND	0.100	ug/l	1	1H12002	08/12/01	08/15/01	GCMS-SIM	
Acenaphthylene	ND	0.100	"	"	"	"	"	"	
Anthracene	ND	0.100	"	"	"	"	"	"	
Benzo (a) anthracene	ND	0.100	"	"	"	"	"	"	
Benzo (a) pyrene	ND	0.100	"	"	"	"	"	"	
Benzo (b) fluoranthene	ND	0.100	"	"	"	"	"	"	
Benzo (ghi) perylene	ND	0.100	"	"	"	"	"	"	
Benzo (k) fluoranthene	ND	0.100	"	"	"	"	"	"	
Chrysene	ND	0.100	"	"	"	"	"	"	
Dibenz (a,h) anthracene	ND	0.100	"	"	"	"	"	"	
Fluoranthene	ND	0.100	"	"	"	"	"	"	
Fluorene	ND	0.100	"	"	"	"	"	"	
Indeno (1,2,3-cd) pyrene	ND	0.100	"	"	"	"	"	"	
Naphthalene	**0.309**	0.100	"	"	"	"	"	"	
Phenanthrene	ND	0.100	"	"	"	"	"	"	
Pyrene	ND	0.100	"	"	"	"	"	"	
Surrogate: 2-FBP	*86.5 %*	*14-115*			"	"	"	"	
Surrogate: Nitrobenzene-d5	*79.5 %*	*10-133*			"	"	"	"	
Surrogate: p-Terphenyl-d14	*32.4 %*	*22-124*			"	"	"	"	

North Creek Analytical - Bothell

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Scott A. Woerman, Project Manager

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0056

Geo Engineers - Alaska	Project: Equilon SAP #120686	
4951 Eagle Street	Project Number: 0401-064-02	**Reported:**
Anchorage AK, 99503-7432	Project Manager: Jamie Oakley	08/24/01 19:10

Gasoline Hydrocarbons (n-Hexane to <n-Decane) and BTEX by AK101 - Quality Control
North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1H20007: Prepared 08/20/01 Using EPA 5030B (P/T)										
Blank (1H20007-BLK1)										
Gasoline Range Hydrocarbons	ND	50.0	ug/l							
Benzene	ND	0.200	"							
Toluene	ND	0.500	"							
Ethylbenzene	ND	0.500	"							
Xylenes (total)	ND	1.00	"							
Surrogate: 4-BFB (FID)	*41.8*		"	*48.0*		*87.1*	*60-120*			
Surrogate: 4-BFB (PID)	*44.2*		"	*48.0*		*92.1*	*60-120*			
LCS (1H20007-BS1)										
Gasoline Range Hydrocarbons	454	50.0	ug/l	500		90.8	60-120			
Surrogate: 4-BFB (FID)	*46.9*		"	*48.0*		*97.7*	*60-120*			
LCS (1H20007-BS2)										
Benzene	9.49	0.200	ug/l	10.0		94.9	60-120			
Toluene	9.90	0.500	"	10.0		99.0	60-120			
Ethylbenzene	10.5	0.500	"	10.0		105	60-120			
Xylenes (total)	31.0	1.00	"	30.0		103	60-120			
Surrogate: 4-BFB (PID)	*44.3*		"	*48.0*		*92.3*	*60-120*			
LCS Dup (1H20007-BSD1)										
Gasoline Range Hydrocarbons	459	50.0	ug/l	500		91.8	60-120	1.10	20	
Surrogate: 4-BFB (FID)	*47.9*		"	*48.0*		*99.8*	*60-120*			
LCS Dup (1H20007-BSD2)										
Benzene	9.50	0.200	ug/l	10.0		95.0	60-120	0.105	20	
Toluene	9.97	0.500	"	10.0		99.7	60-120	0.705	20	
Ethylbenzene	10.4	0.500	"	10.0		104	60-120	0.957	20	
Xylenes (total)	31.3	1.00	"	30.0		104	60-120	0.963	20	
Surrogate: 4-BFB (PID)	*44.0*		"	*48.0*		*91.7*	*60-120*			

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Geo Engineers - Alaska	Project: Equilon SAP #120686	
4951 Eagle Street	Project Number: 0401-064-02	**Reported:**
Anchorage AK, 99503-7432	Project Manager: Jamie Oakley	08/24/01 19:10

Gasoline Hydrocarbons (n-Hexane to <n-Decane) and BTEX by AK101 - Quality Control
North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1H20007: Prepared 08/20/01 Using EPA 5030B (P/T)										
Matrix Spike (1H20007-MS1)					**Source: B1H0256-06**					
Gasoline Range Hydrocarbons	447	50.0	ug/l	500	ND	89.4	60-120			
Surrogate: 4-BFB (FID)	*47.5*		"	*48.0*		*99.0*	*60-120*			
Matrix Spike (1H20007-MS2)					**Source: B1H0256-05**					
Benzene	9.51	0.200	ug/l	10.0	ND	93.1	60-120			
Toluene	9.92	0.500	"	10.0	ND	97.4	60-120			
Ethylbenzene	10.2	0.500	"	10.0	ND	100	60-120			
Xylenes (total)	30.9	1.00	"	30.0	ND	101	60-120			
Surrogate: 4-BFB (PID)	*44.5*		"	*48.0*		*92.7*	*60-120*			
Matrix Spike Dup (1H20007-MSD1)					**Source: B1H0256-06**					
Gasoline Range Hydrocarbons	430	50.0	ug/l	500	ND	86.0	60-120	3.88	20	
Surrogate: 4-BFB (FID)	*46.7*		"	*48.0*		*97.3*	*60-120*			
Matrix Spike Dup (1H20007-MSD2)					**Source: B1H0256-05**					
Benzene	9.55	0.200	ug/l	10.0	ND	93.5	60-120	0.420	20	
Toluene	9.85	0.500	"	10.0	ND	96.8	60-120	0.708	20	
Ethylbenzene	10.1	0.500	"	10.0	ND	99.1	60-120	0.985	20	
Xylenes (total)	30.5	1.00	"	30.0	ND	99.8	60-120	1.30	20	
Surrogate: 4-BFB (PID)	*44.3*		"	*48.0*		*92.3*	*60-120*			

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0058

Geo Engineers - Alaska	Project: Equilon SAP #120686	
4951 Eagle Street	Project Number: 0401-064-02	**Reported:**
Anchorage AK, 99503-7432	Project Manager: Jamie Oakley	08/24/01 19:10

Diesel Hydrocarbons (C10-C25) and Heavy Oil (C25-C36) by AK102 and AK103 - Quality Control
North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1H13012: Prepared 08/13/01 Using EPA 3520C/600 Series										
Blank (1H13012-BLK1)										
Diesel Range Hydrocarbons	ND	0.100	mg/l							
Residual Range Organics	ND	0.750	"							
Surrogate: 2-FBP	*0.279*		"	*0.320*		*87.2*	*50-150*			
Surrogate: Octacosane	*0.279*		"	*0.320*		*87.2*	*50-150*			
LCS (1H13012-BS1)										
Diesel Range Hydrocarbons	1.61	0.100	mg/l	2.00		80.5	60-120			
Surrogate: 2-FBP	*0.269*		"	*0.320*		*84.1*	*50-150*			
LCS (1H13012-BS2)										
Residual Range Organics	1.67	0.750	mg/l	2.00		83.5	60-100			
Surrogate: Octacosane	*0.281*		"	*0.320*		*87.8*	*50-150*			
LCS Dup (1H13012-BSD1)										
Diesel Range Hydrocarbons	1.71	0.100	mg/l	2.00		85.5	60-120	6.02	20	
Surrogate: 2-FBP	*0.284*		"	*0.320*		*88.8*	*50-150*			
LCS Dup (1H13012-BSD2)										
Residual Range Organics	1.69	0.750	mg/l	2.00		84.5	60-100	1.19	20	
Surrogate: Octacosane	*0.282*		"	*0.320*		*88.1*	*50-150*			

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0059

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Geo Engineers - Alaska	Project: Equilon SAP #120686	
4951 Eagle Street	Project Number: 0401-064-02	**Reported:**
Anchorage AK, 99503-7432	Project Manager: Jamie Oakley	08/24/01 19:10

Polynuclear Aromatic Compounds by GC/MS with Selected Ion Monitoring - Quality Control
North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1H12002: Prepared 08/12/01 Using EPA 3520C/600 Series										
Blank (1H12002-BLK1)										
Acenaphthene	ND	0.100	ug/l							
Acenaphthylene	ND	0.100	"							
Anthracene	ND	0.100	"							
Benzo (a) anthracene	ND	0.100	"							
Benzo (a) pyrene	ND	0.100	"							
Benzo (b) fluoranthene	ND	0.100	"							
Benzo (ghi) perylene	ND	0.100	"							
Benzo (k) fluoranthene	ND	0.100	"							
Chrysene	ND	0.100	"							
Dibenz (a,h) anthracene	ND	0.100	"							
Fluoranthene	ND	0.100	"							
Fluorene	ND	0.100	"							
Indeno (1,2,3-cd) pyrene	ND	0.100	"							
Naphthalene	ND	0.100	"							
Phenanthrene	ND	0.100	"							
Pyrene	ND	0.100	"							
Surrogate: 2-FBP	*51.3*		"	*50.0*		*103*	*14-115*			
Surrogate: Nitrobenzene-d5	*44.5*		"	*50.0*		*89.0*	*10-133*			
Surrogate: p-Terphenyl-d14	*59.3*		"	*50.0*		*119*	*22-124*			
LCS (1H12002-BS1)										
Chrysene	9.14	0.100	ug/l	10.0		91.4	50-123			
Fluorene	8.66	0.100	"	10.0		86.6	31-132			
Indeno (1,2,3-cd) pyrene	7.76	0.100	"	10.0		77.6	27-146			
Surrogate: 2-FBP	*46.7*		"	*50.0*		*93.4*	*14-115*			
Surrogate: Nitrobenzene-d5	*42.4*		"	*50.0*		*84.8*	*10-133*			
Surrogate: p-Terphenyl-d14	*50.2*		"	*50.0*		*100*	*22-124*			

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T060

Geo Engineers - Alaska	Project: Equilon SAP #120686	
4951 Eagle Street	Project Number: 0401-064-02	**Reported:**
Anchorage AK, 99503-7432	Project Manager: Jamie Oakley	08/24/01 19:10

Polynuclear Aromatic Compounds by GC/MS with Selected Ion Monitoring - Quality Control
North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1H12002: Prepared 08/12/01 Using EPA 3520C/600 Series										
LCS Dup (1H12002-BSD1)										
Chrysene	9.62	0.100	ug/l	10.0		96.2	50-123	5.12	27	
Fluorene	9.04	0.100	"	10.0		90.4	31-132	4.29	36	
Indeno (1,2,3-cd) pyrene	8.78	0.100	"	10.0		87.8	27-146	12.3	31	
Surrogate: 2-FBP	*47.2*		"	*50.0*		*94.4*	*14-115*			
Surrogate: Nitrobenzene-d5	*43.1*		"	*50.0*		*86.2*	*10-133*			
Surrogate: p-Terphenyl-d14	*50.5*		"	*50.0*		*101*	*22-124*			

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Geo Engineers - Alaska	Project: Equilon SAP #120686	
4951 Eagle Street	Project Number: 0401-064-02	**Reported:**
Anchorage AK, 99503-7432	Project Manager: Jamie Oakley	08/24/01 19:10

Notes and Definitions

D-08	Results in the diesel organics range are primarily due to overlap from a gasoline range product.
D-09	Results in the diesel organics range are primarily due to overlap from a heavy oil range product.
I-06	The analyte concentration may be artificially elevated due to coeluting compounds or components.
S-04	The surrogate recovery for this sample is outside of established control limits due to a sample matrix effect.
DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit
NR	Not Reported
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference

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CHAIN OF CUSTODY REPORT

Work Order #: B1H0281

CLIENT: Equiva

REPORT TO: Samie Oakley w/ GeoEngineers

ADDRESS: 4957 Eagle St
Anchorage, AK 99503

PHONE: (907) 561-5478 FAX: 561-5123

INVOICE TO: Attn: Tony Palagyi
Equiva, LLC.
1062 NE 38th Place
Kirkland, WA 98033

P.O. NUMBER:

PROJECT NAME: Texaco 63-057-0092

PROJECT NUMBER: 0401-064-02

SAMPLED BY: DKR

TURNAROUND REQUEST in Business Days*

Organic & Inorganic Analyses: 10 | 7 | 5 | 4 | 3 | 2 | 1 | <1

STD. Petroleum Hydrocarbon Analyses: 5 | 4 | 3 | 2 | 1 | <1

STD. OTHER Please Specify

*Turnaround Requests less than standard may incur Rush Charges.

CLIENT SAMPLE IDENTIFICATION	SAMPLING DATE/TIME	BETX/GRO AK101	DRO/RRO AK102/103	PAH 8270 SIM	MATRIX (W, S, O)	# OF CONT.	COMMENTS	NCA WO ID
1. MW-1	8/9/01 - 1300		X	X	W	4		01
2. MW-C	8/9/01 - 1230	X			W	3		02
3. MW-D	8/9/01 - 1250	X			W	3		03
4. MW-E	8/9/01 - 1340	X	X	X	W	7		04
5. MW-F	8/9/01 - 1305	X	X	X	W	7		05
6. Duplicate	8/9/01	X			W	3		06
7. Trip Blank	8/9/01	X			W	1		07
8.							0062	
9.								
10.								
11.								
12.								
13.								
14.								
15.								

RELINQUISHED BY: Deanne Raita DATE: 8/9/01
PRINT NAME: Deanne Raita FIRM: GET TIME: 1400

RECEIVED BY: Clarence A. Wisdom DATE: 8/10/01
PRINT NAME: M. WISDOM FIRM: NCA TIME: 1040

RELINQUISHED BY: DATE:
PRINT NAME: FIRM: TIME:

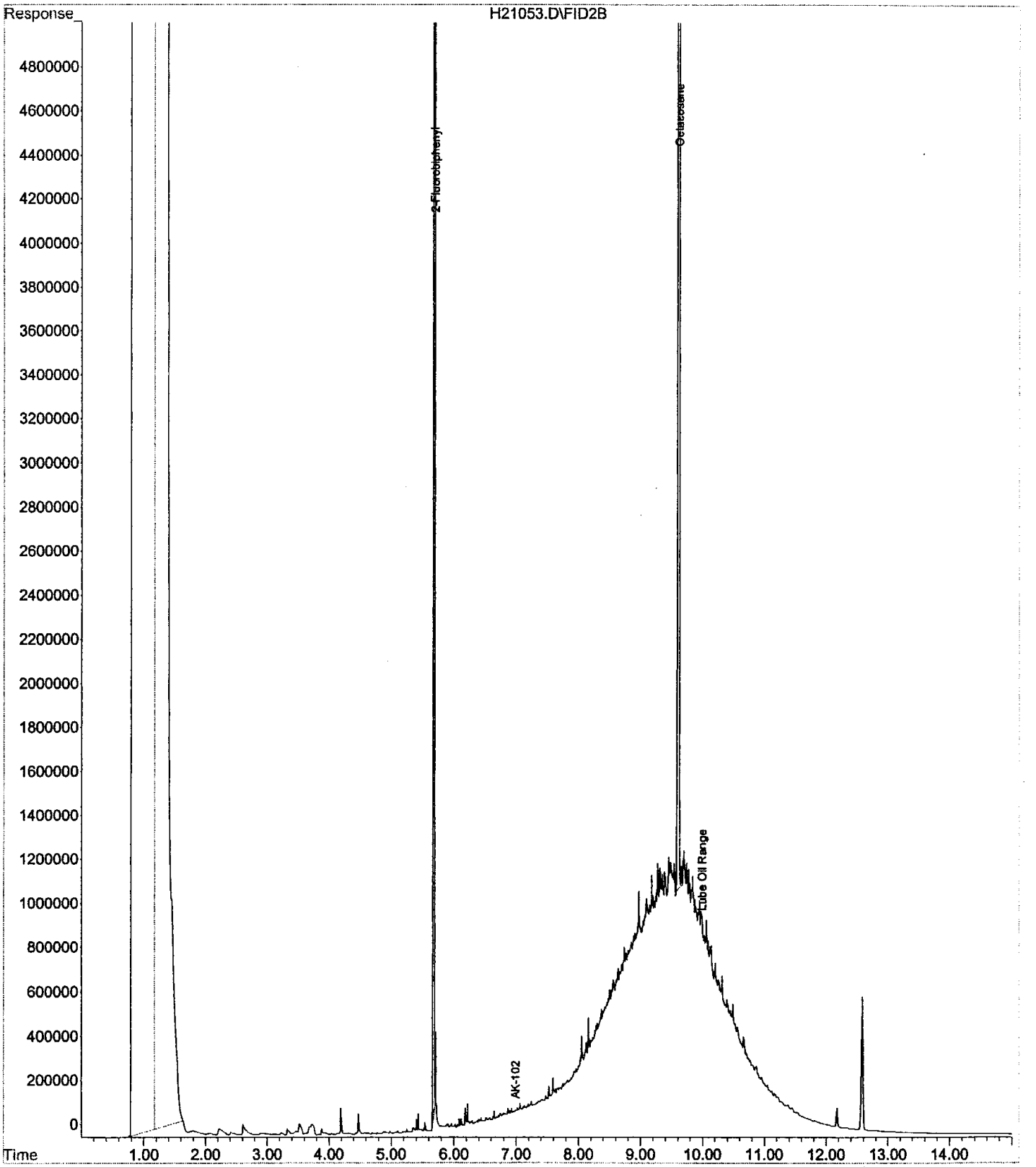
RECEIVED BY: DATE:
PRINT NAME: FIRM: TIME:

ADDITIONAL REMARKS:

1105 TEMP: 3.6 E

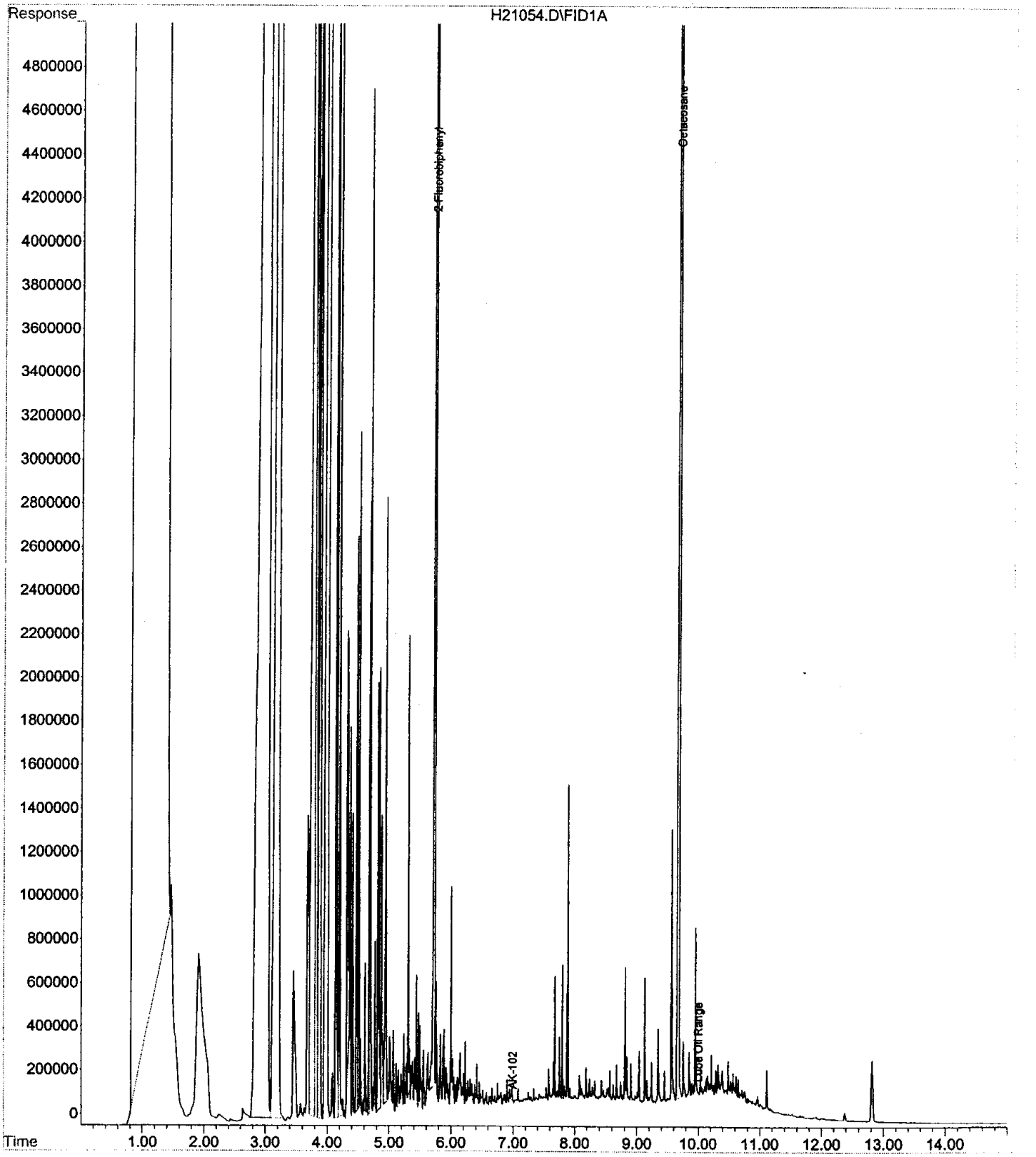
File : C:\HPCHEM\1\DATA.SEC\H21053.D
Operator : GAP
Acquired : 8-21-01 17:07:20 using AcqMethod 22901!9A.M
Instrument : GC #9
Sample Name: b1h0281-01
Misc Info : 1x AK102/103
Vial Number: 14

0063



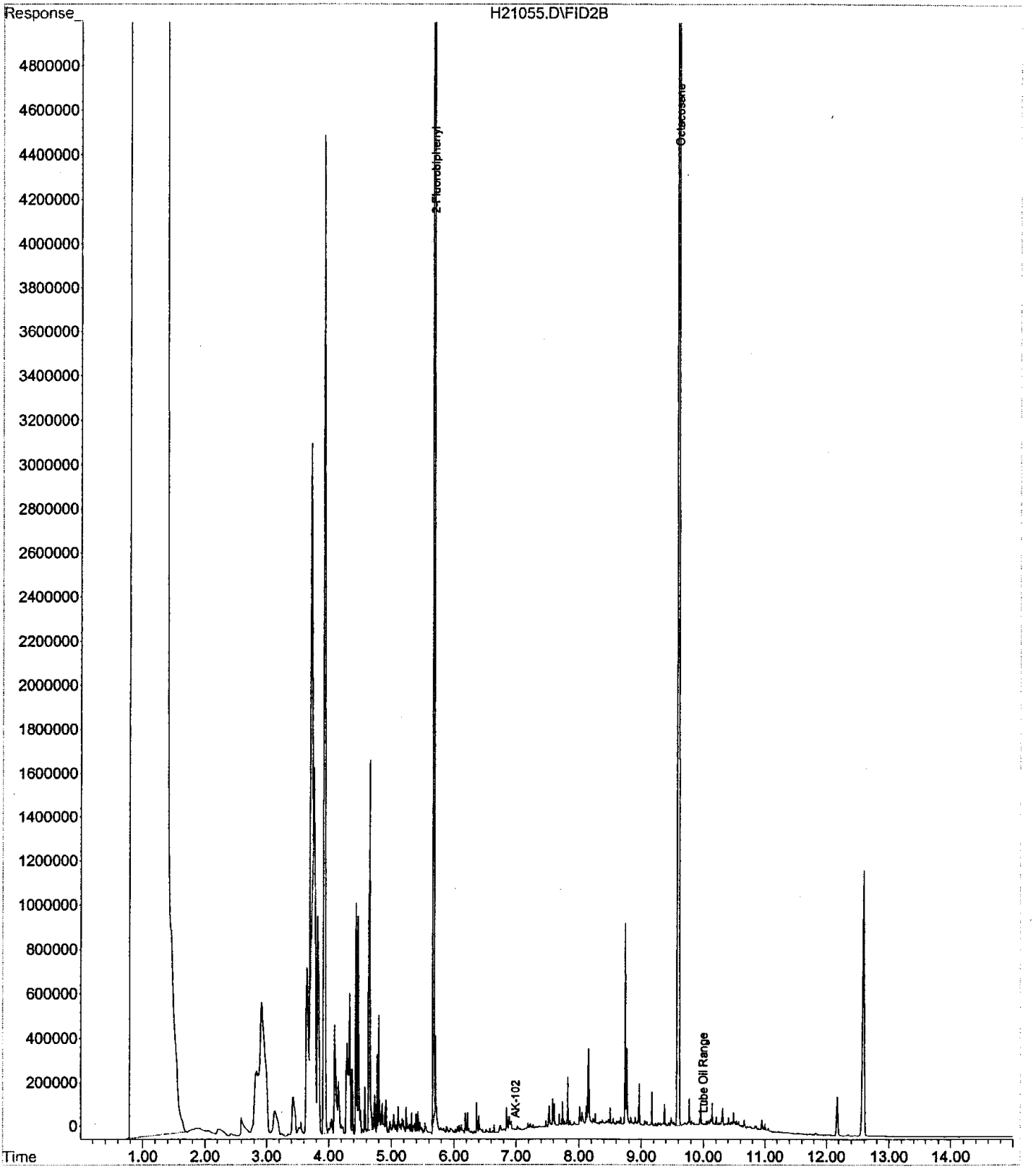
File : C:\HPCHEM\1\DATA\H21054.D
Operator : GAP
Acquired : 8-21-01 17:07:20 using AcqMethod 22901!9A.M
Instrument : GC #9
Sample Name: b1h0281-04
Misc Info : 1x AK102/103
Vial Number: 15

0064



File : C:\HPCHEM\1\DATA.SEC\H21055.D
Operator : GAP
Acquired : 8-21-01 17:29:29 using AcqMethod 22901!9A.M
Instrument : GC #9
Sample Name: b1h0281-05
Misc Info : 1x AK102/103
Vial Number: 16

0065



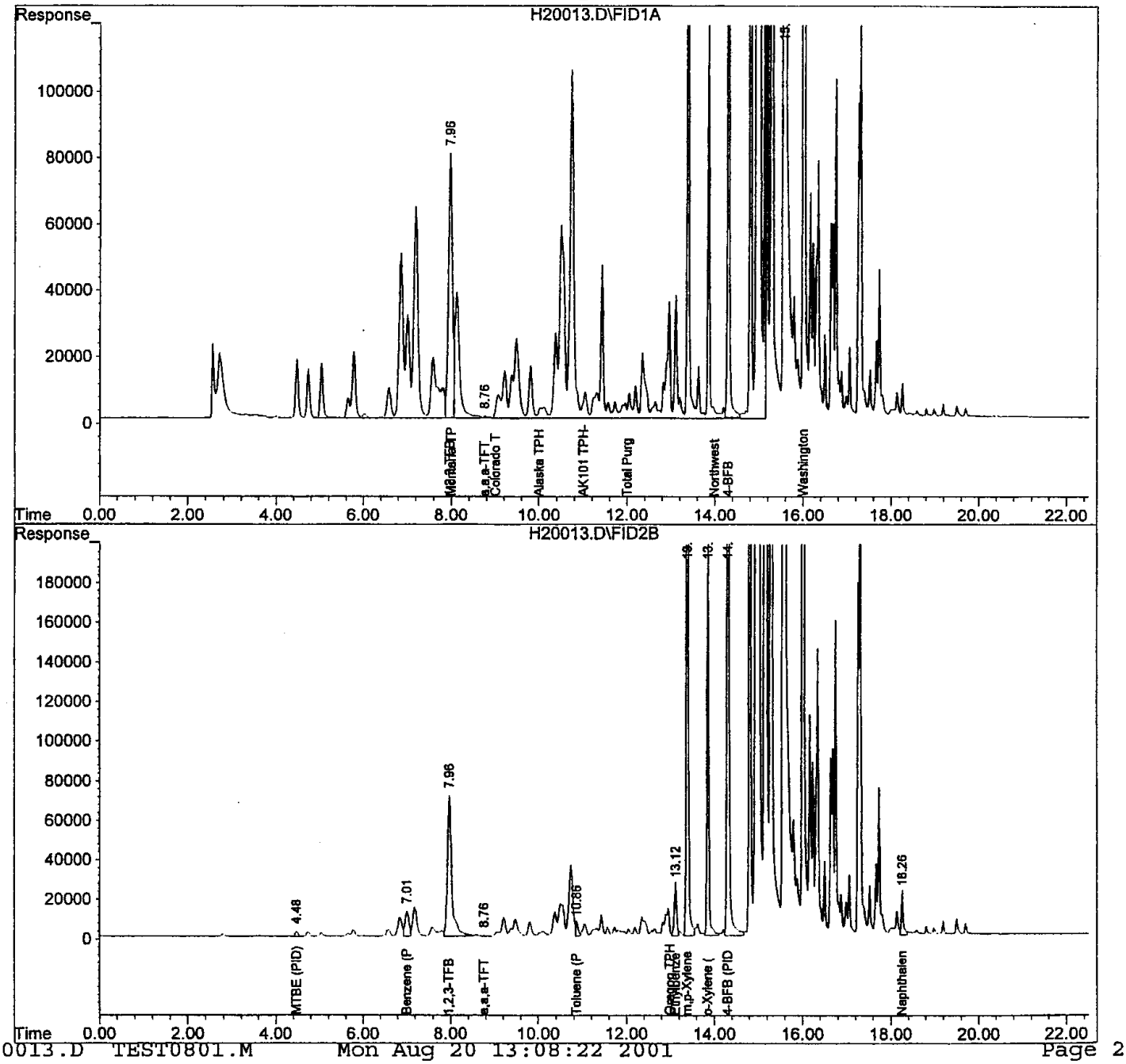
Signal #1 : D:\HPCHEM\3\DATA\082001\H20013.D\FID1A.CH Vial: 13
Signal #2 : D:\HPCHEM\3\DATA\082001\H20013.D\FID2B.CH
Acq On : 20 Aug 2001 12:45 pm Operator: aa
Sample : b1h0281-02 Inst : GC #6
Misc : 1x 5 mL (2.5 + 2.5) Multiplr: 1.00
0066 Sample Amount: 0.00

IntFile Signal #1: SURR.E IntFile Signal #2: SURR2.E

Quant Time: Aug 20 13:08 2001 Quant Results File: TEST0801.RES

Quant Method : D:\HPCHEM\3\METHODS\TEST0801.M (Chemstation Integrator)
Title : TPH-G Method
Last Update : Sun Aug 19 11:14:59 2001
Response via : Multiple Level Calibration
DataAcq Meth : TEST0801.M

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



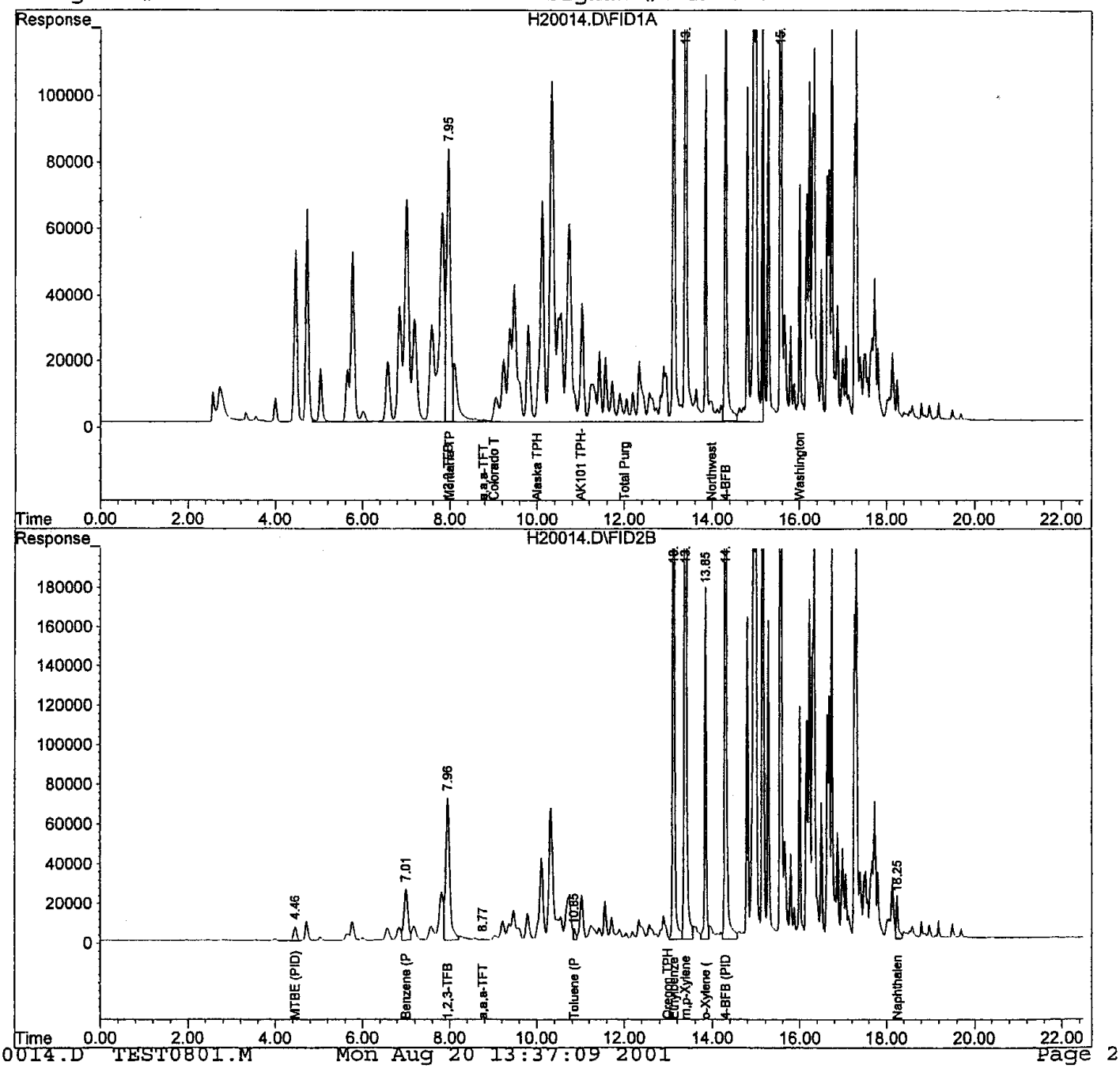
Quantitation Report

Signal #1 : D:\HPCHEM\3\DATA\082001\H20014.D\FID1A.CH Vial: 14
Signal #2 : D:\HPCHEM\3\DATA\082001\H20014.D\FID2B.CH
Acq On : 20 Aug 2001 1:14 pm Operator: aa
Sample : b1h0281-03 Inst : GC #6
Misc : 1x 5 mL 0067 Multiplr: 1.00
Sample Amount: 0.00
IntFile Signal #1: SURR.E IntFile Signal #2: SURR2.E

Quant Time: Aug 20 13:37 2001 Quant Results File: TEST0801.RES

Quant Method : D:\HPCHEM\3\METHODS\TEST0801.M (Chemstation Integrator)
Title : TPH-G Method
Last Update : Sun Aug 19 11:14:59 2001
Response via : Multiple Level Calibration
DataAcq Meth : TEST0801.M

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

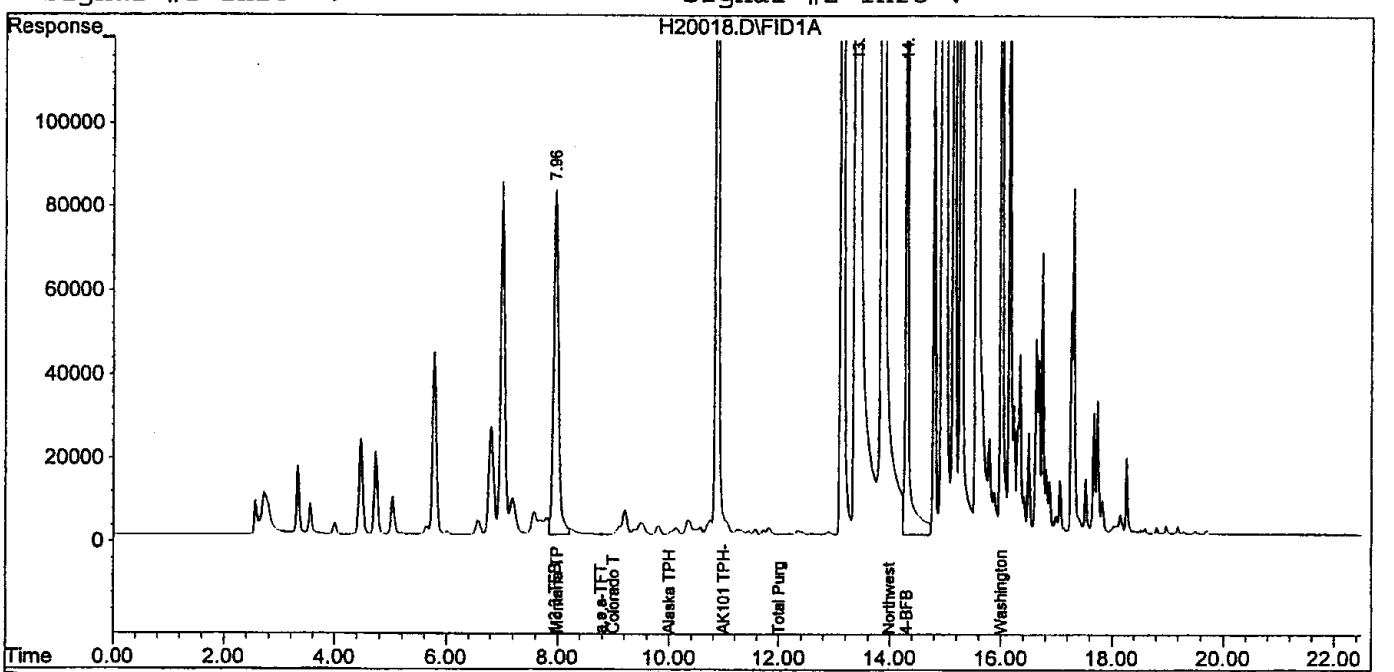


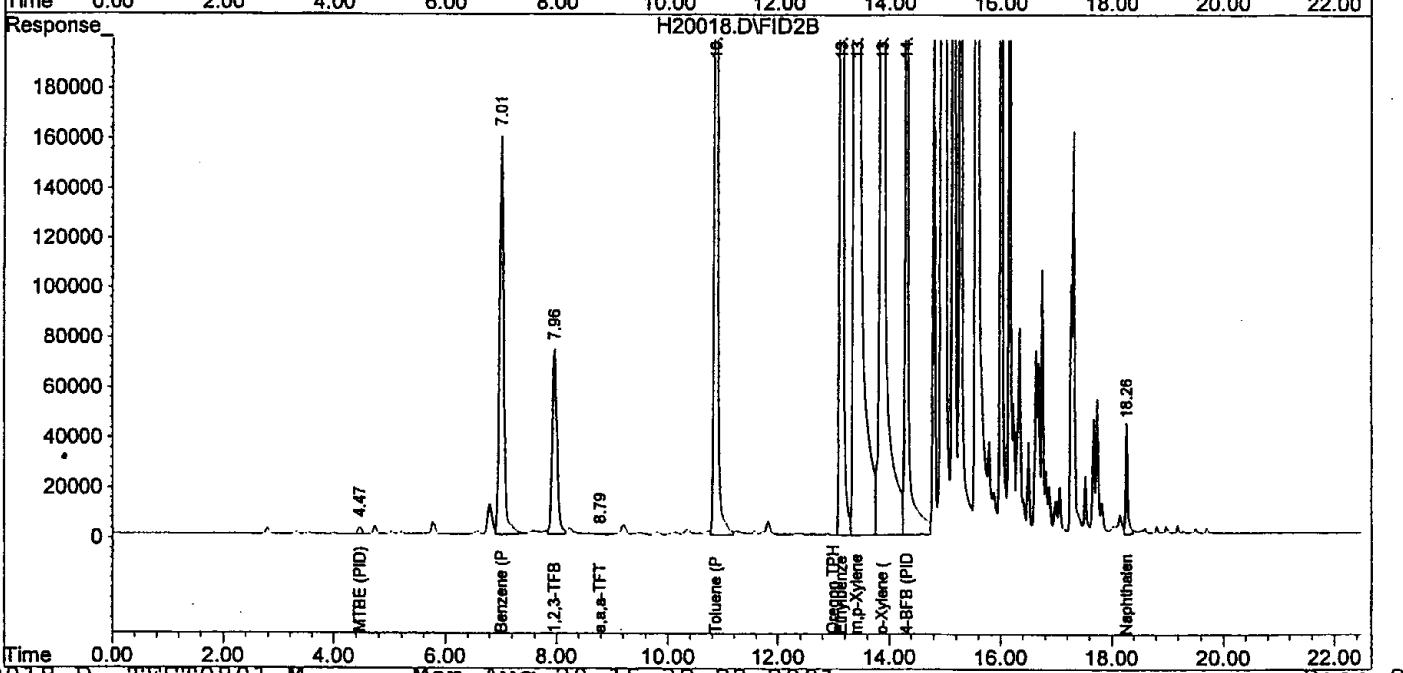
Signal #1 : D:\HPCHEM\3\DATA\082001\H20018.D\FID1A.CH Vial: 18
Signal #2 : D:\HPCHEM\3\DATA\082001\H20018.D\FID2B.CH
Acq On : 20 Aug 2001 3:09 pm Operator: aa
Sample : blh0281-04 0068 Inst : GC #6
Misc : 1x 5 mL Multiplr: 1.00
Sample Amount: 0.00
IntFile Signal #1: SURR.E IntFile Signal #2: SURR2.E

Quant Time: Aug 20 15:32 2001 Quant Results File: TEST0801.RES

Quant Method : D:\HPCHEM\3\METHODS\TEST0801.M (Chemstation Integrator)
Title : TPH-G Method
Last Update : Sun Aug 19 11:14:59 2001
Response via : Multiple Level Calibration
DataAcq Meth : TEST0801.M

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





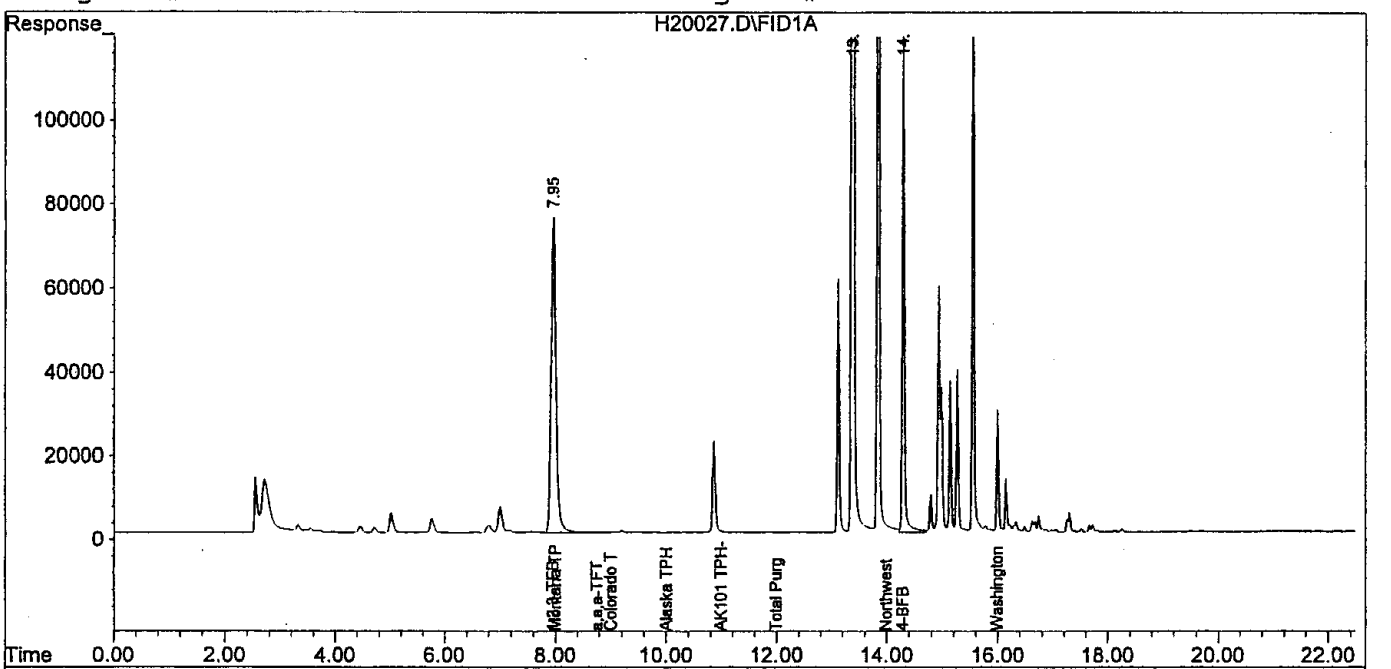
Signal #1 : D:\HPCHEM\3\DATA\082001\H20027.D\FID1A.CH Vial: 27
Signal #2 : D:\HPCHEM\3\DATA\082001\H20027.D\FID2B.CH
Acq On : 20 Aug 2001 7:36 pm Operator: aa
Sample : b1H0281-04 r1 Inst : GC #6
Misc : 20x 250 uL Multiplr: 1.00
0069 Sample Amount: 0.00

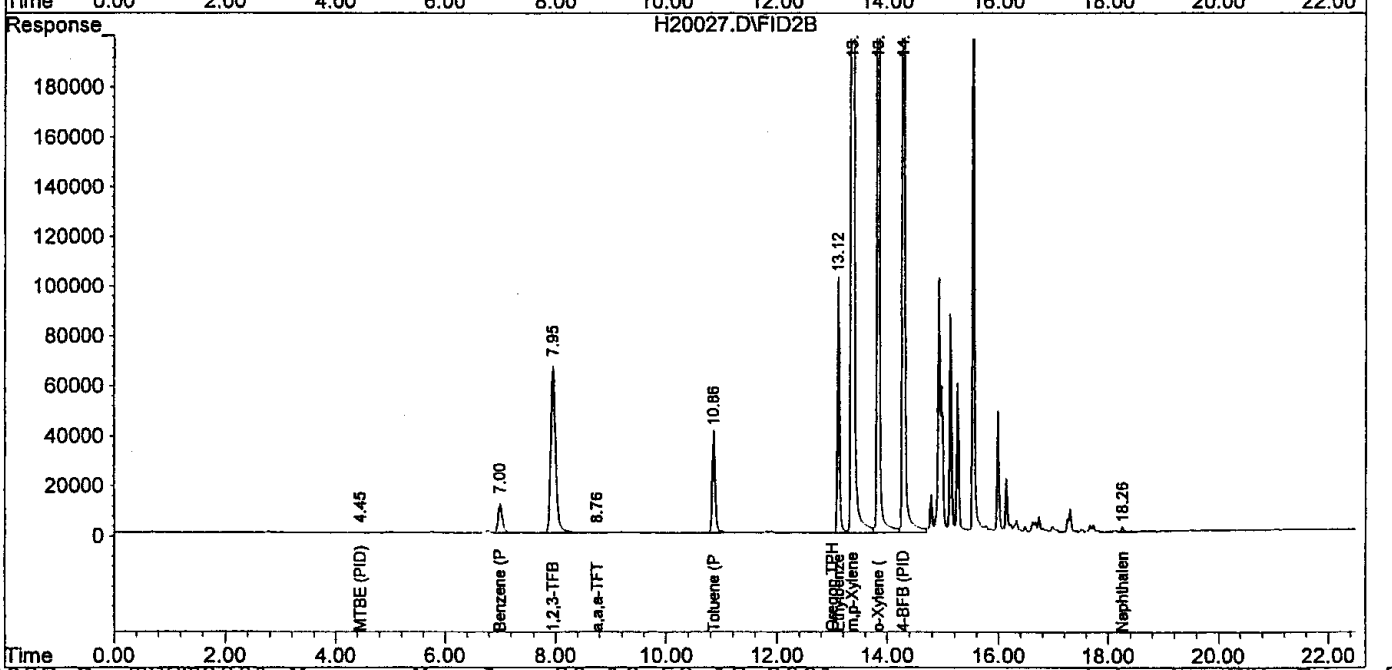
IntFile Signal #1: SURR.E IntFile Signal #2: SURR2.E

Quant Time: Aug 20 19:59 2001 Quant Results File: TEST0801.RES

Quant Method : D:\HPCHEM\3\METHODS\TEST0801.M (Chemstation Integrator)
Title : TPH-G Method
Last Update : Sun Aug 19 11:14:59 2001
Response via : Multiple Level Calibration
DataAcq Meth : TEST0801.M

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



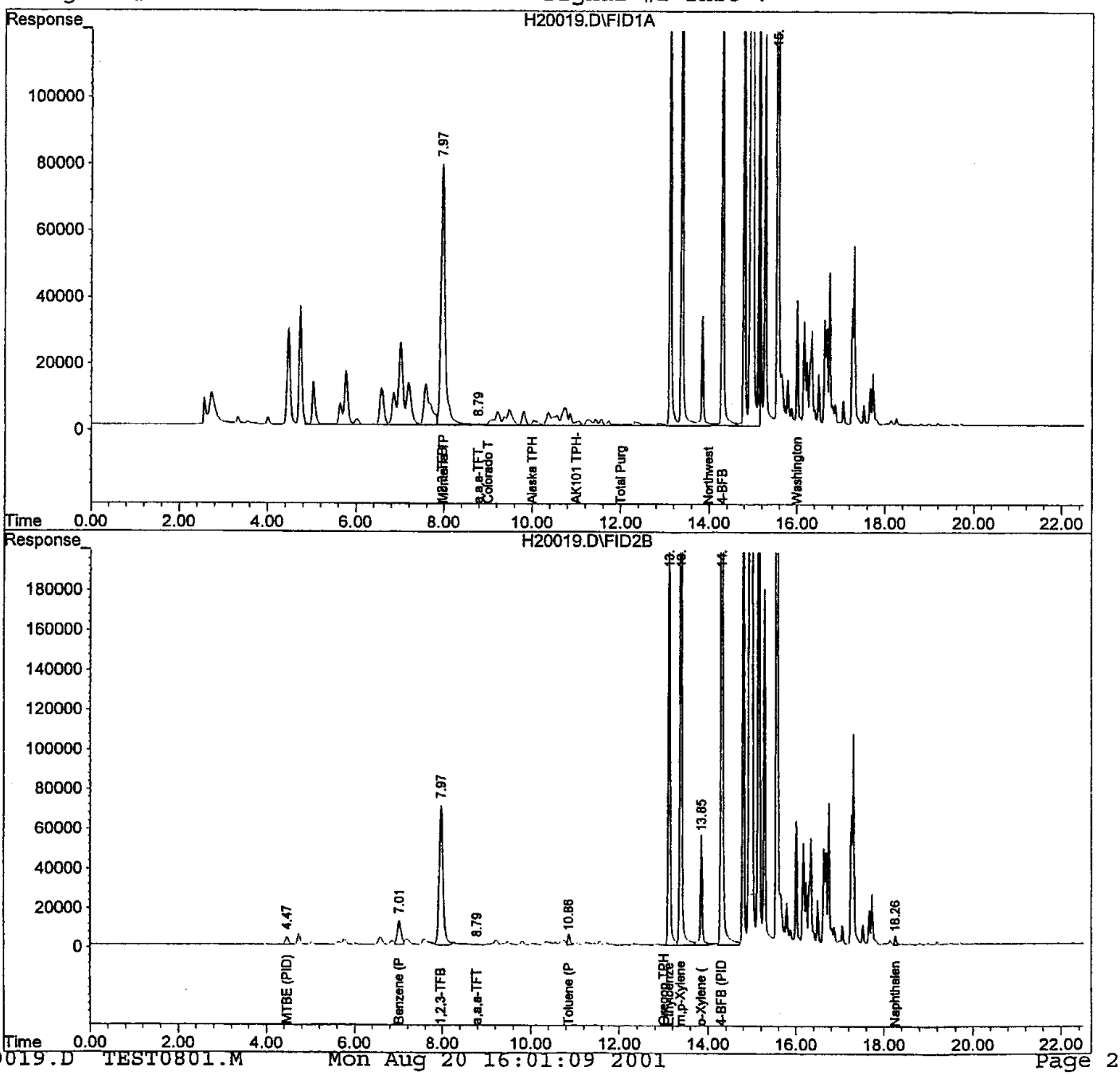


Signal #1 : D:\HPCHEM\3\DATA\082001\H20019.D\FID1A.CH Vial: 19
Signal #2 : D:\HPCHEM\3\DATA\082001\H20019.D\FID2B.CH
Acq On : 20 Aug 2001 3:38 pm Operator: aa
Sample : blh0281-05 0070 Inst : GC #6
Misc : 1x 5 mL Multiplr: 1.00
Sample Amount: 0.00
IntFile Signal #1: SURR.E IntFile Signal #2: SURR2.E

Quant Time: Aug 20 16:01 2001 Quant Results File: TEST0801.RES

Quant Method : D:\HPCHEM\3\METHODS\TEST0801.M (Chemstation Integrator)
Title : TPH-G Method
Last Update : Sun Aug 19 11:14:59 2001
Response via : Multiple Level Calibration
DataAcq Meth : TEST0801.M

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



Signal #1 : D:\HPCHEM\3\DATA\082001\H20028.D\FID1A.CH Vial: 28
Signal #2 : D:\HPCHEM\3\DATA\082001\H20028.D\FID2B.CH
Acq On : 20 Aug 2001 8:05 pm Operator: aa
Sample : b1H0281-06 r1 Inst : GC #6
Misc : 2.5x 2 mL Multiplr: 1.00
Sample Amount: 0.00

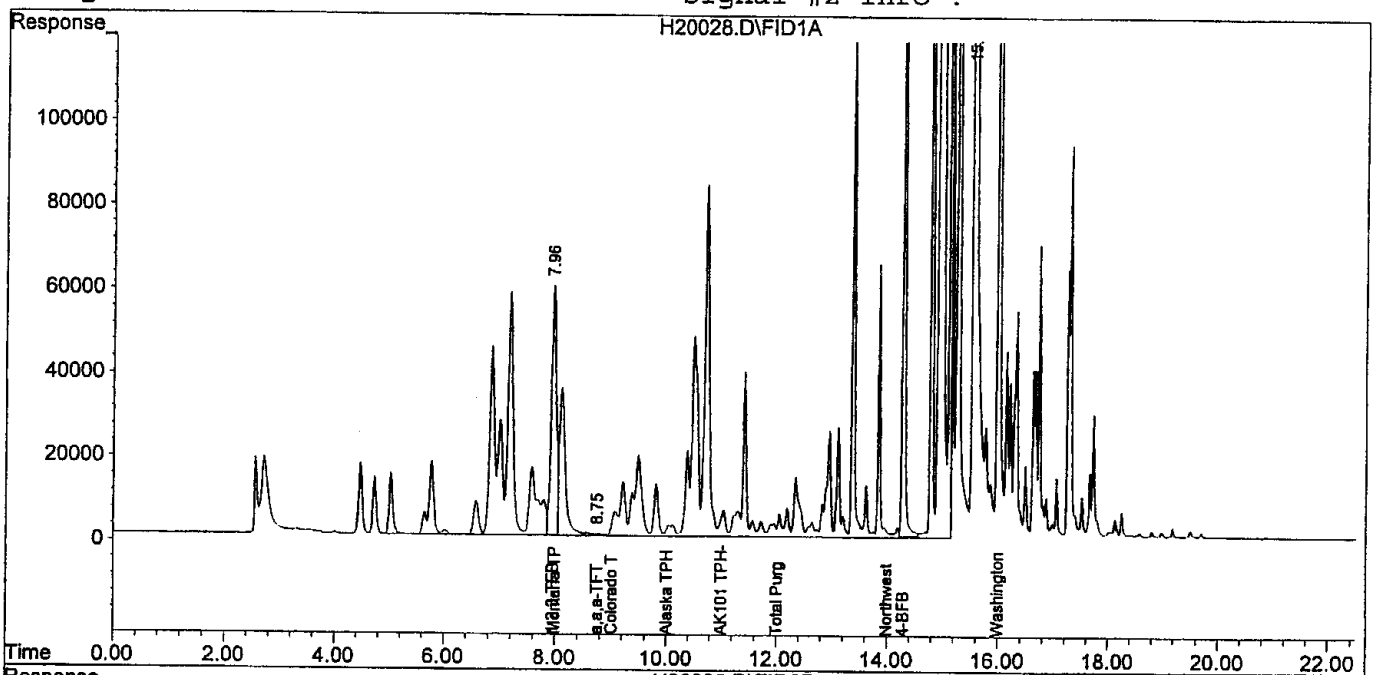
0071

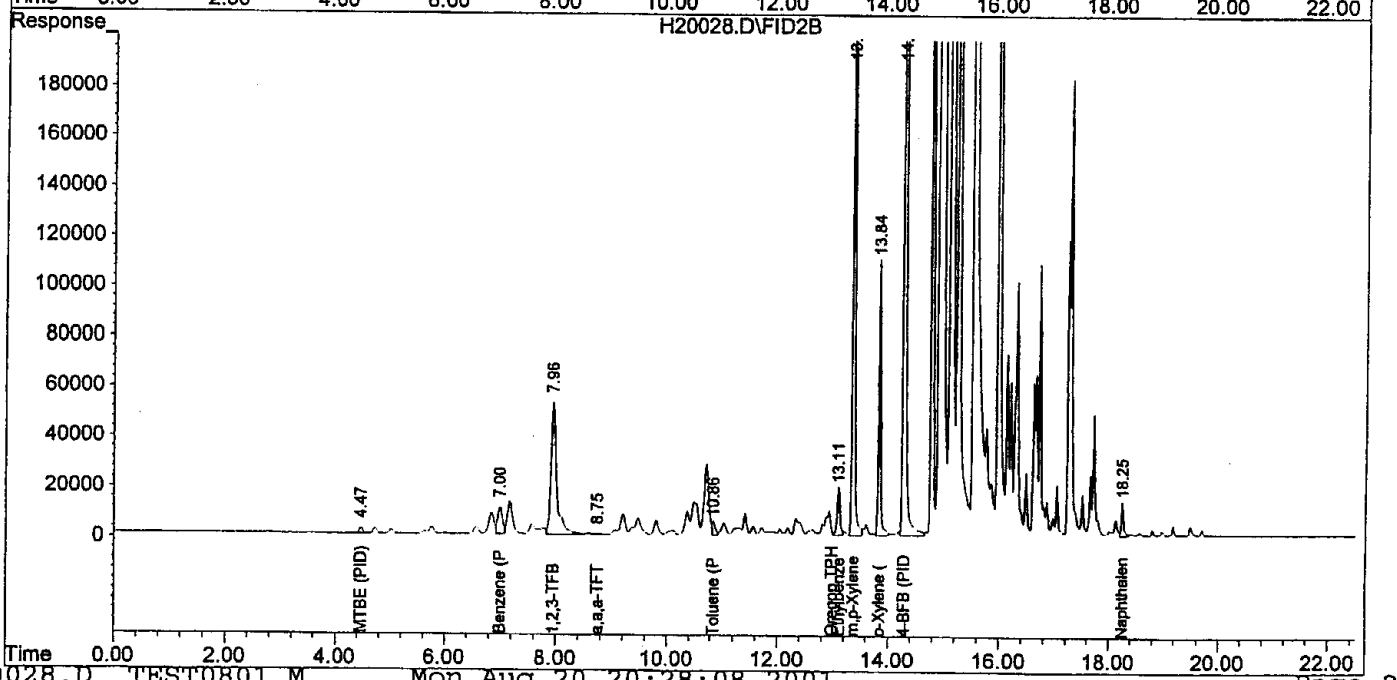
IntFile Signal #1: SURR.E IntFile Signal #2: SURR2.E

Quant Time: Aug 20 20:28 2001 Quant Results File: TEST0801.RES

Quant Method : D:\HPCHEM\3\METHODS\TEST0801.M (Chemstation Integrator)
Title : TPH-G Method
Last Update : Sun Aug 19 11:14:59 2001
Response via : Multiple Level Calibration
DataAcq Meth : TEST0801.M

Volume Inj. :
Signal #1 Phase :
Signal #1 Info :
Signal #2 Phase:
Signal #2 Info :





Signal #1 : D:\HPCHEM\3\DATA\082001\H20021.D\FID1A.CH Vial: 21
Signal #2 : D:\HPCHEM\3\DATA\082001\H20021.D\FID2B.CH
Acq On : 20 Aug 2001 4:35 pm Operator: aa
Sample : b1h0281-07 Inst : GC #6
Misc : 1x 5 mL TB 0072 Multiplr: 1.00
Sample Amount: 0.00

IntFile Signal #1: SURR.E IntFile Signal #2: SURR2.E

Quant Time: Aug 20 16:58 2001 Quant Results File: TEST0801.RES

Quant Method : D:\HPCHEM\3\METHODS\TEST0801.M (Chemstation Integrator)
Title : TPH-G Method
Last Update : Sun Aug 19 11:14:59 2001
Response via : Multiple Level Calibration
DataAcq Meth : TEST0801.M

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :