

April 21, 2020

Parametrix No. 553-1521-242 (01.02)

Mr. John Greene

King County Transit Division - Design & Construction Section

Environmental Planning and Real Estate

201 South Jackson Street, M.S. KSC-TR-0431

Seattle, WA 98104-3856

Re: South Facilities Push Probe Investigation Results, East Marginal Way South, Tukwila, Washington

Dear Mr. Greene:

This report documents the results of a push probe investigation conducted at Metro's South Facilities, located at 11911 E Marginal Way S, Tukwila, WA 98168 (the Subject Property). Parametrix' services were performed under Work Order No. 01 to Contract No. E00635E19.

The objectives of the work were to determine the source of contamination found in groundwater collected from well SB-8, and to verify/determine lack of migration of historic groundwater contamination from the underground storage tank (UST) area of South Facilities, and specifically to address any migration potential from the Subject Property to the neighboring King County Metro South Base Annex property to the east.

BACKGROUND

The Subject Property is located between State Route 599 and East Marginal Way South, approximately 1/4 mile south of the Duwamish River in the city of Tukwila (see Figure 1). It is west-northwest of Metro Transit's existing South Base, located at 12200 East Marginal Way South. Topographically the Subject Property is generally flat, with a slight slope to the west in the westernmost edge of the Subject Property with overall slope toward the north (King County GIS; USGS 2017). Groundwater has been documented in previous reports to flow toward the northwest.

The Subject Property is on Ecology's confirmed and suspected contaminated sites list (CSCSL) and is identified by Facility Site ID 8422289 and Cleanup Site Property ID 7790. In 2015, the Department of Ecology (Ecology) conducted a Site Hazard Assessment (SHA) and assigned a ranking of 1 (highest priority). The SHA findings were based on the results of environmental site assessment studies conducted in the 1990's in the vicinity of the former underground storage tanks (USTs), including concentrations of benzene above the Model Toxics Control Act (MTCA) Method A cleanup level (CUL).

Two site assessments were conducted at the Subject Property in the 1990s: Woodward-Clyde (1995), a pre-construction site assessment study conducted in 1994 related to upgrade of the USTs; and AGI Technologies (1997) documenting site assessment actions performed in April 1997 during removal of three USTs. During the site investigations, TPH was detected in soil and groundwater and benzene was detected above the MTCA Method A CUL in one monitoring well.

More recent work at the Subject Property was conducted in 2019 and included a review of files at the Department of Ecology and an initial resampling of four wells (DW-3, DW-4, SB-7 and SB-8) in September 2019 (Parametrix 2019a). The four wells were surveyed (Parametrix 2020) and the wells were redeveloped and resampled in December 2019 (PBS 2020). Benzene was not detected during either sampling event, although

diesel and oil-range petroleum hydrocarbons were detected in well SB-8 during the September 2019 event, with oil-range concentrations above the MTCA Method A CUL.

PUSH-PROBE INVESTIGATION

On April 1, 2020, a push probe investigation was conducted at the South Facilities, consisting of sampling soil and groundwater at nine boring locations (20B1 through 20B9) shown on Figure 2. Borings 20B1 through 20B4 were drilled in the northeast corner of the Subject Property near monitoring well SB-8. Borings 20B5, 20B6, 20B7, and 20B9 were drilled in the southeast area of the Subject Property between the former tanks and the eastern Subject Property boundary. Boring 20B8 was drilled in the western portion of the Subject Property downgradient from the former USTs.

Drilling was conducted by the drilling subcontractor, Cascade Drilling. Borings were advanced to 10 to 15 feet below ground surface (bgs) using a direct push drill rig. The direct push probe consists of a section of hollow steel rod attached to a 5-ft long macro core sample barrel. After a section of the steel rod is advanced in each boring to specific sampling depths, the sampler, lined with a clear acetate tubing, is attached to the rod and advanced five feet. The clear acetate liner containing the soil sample is then removed from the sample barrel, a clean acetate liner inserted into the sample barrel, and the steel rod replaced into the boring.

Each boring was sampled and logged continuously in 5-ft intervals. A table of boring information including soil types and samples collected is provided in Attachment A. Photographs of the sampling location settings and cores are provided in Attachment B.

Soils observed consist of three to seven feet of sand and gravel fill above layers of black, brown, and gray silt, clayey silt, peat/organics; and black fine to medium-grained volcanic sands. The soils encountered correlate with the Quaternary peat (Qp) deposits mapped for the Subject Property (Troost et al 2005) with layers of Quaternary alluvium (Qal) more prevalent at depth.

The depth to water was measured in the four on-site wells (DW-3, DW-4, SB-7, and SB-8) and found to be 4.48 to 5.33 feet below ground surface. These data were used to calculate groundwater elevations and are presented in Table 1, along with data for the two 2019 monitoring events. The measured groundwater elevations are generally consistent with the northwesterly groundwater flow direction cited in previous reports.

Groundwater was encountered in each of the boreholes at varying depths; however, water availability for sampling was primarily in the sandy silt and fine to medium sand layers. The silt, clayey silt, and peat generally was observed to be moist to wet with completely saturated layers intermixed.

Temporary PVC wells were installed in each boring and the wells were purged until groundwater was relatively free of turbidity. Groundwater samples were collected using a peristaltic pump and disposable tubing and placed in analysis-appropriate containers and placed in a cooler with ice. Samples were transported under chain-of-custody to On-Site Environmental, Inc. in Redmond, Washington.

One groundwater sample from each location (20B1-W through 20B9-W) was analyzed for Gasoline-range Total Petroleum Hydrocarbons (TPH-G) and Benzene, Toluene, Ethylbenzene and Xylenes (BTEX) by Method NWTPH Gx/EPA 8021B, and for Diesel and Heavy Oil-range hydrocarbons (TPH-D and TPH-O) by Method NWTPH-Dx.

Six soil samples were collected, and four of the samples (20B1-5, 20B2-3.5, 20B3-4.5, and 20B4-4.5) were tested for TPH-D and TPH-O by Method NWTPH-Dx.

LABORATORY RESULTS

The laboratory report is provided in Attachment C, and the results are summarized in Table 2. The soil sample 20B1-5 ft contained TPH-O at a concentration of 68 mg/kg, below the MTCA Method A CUL of 2,000 mg/kg. This sample was collected near the top of the peat encountered in 20B1.

TPH-G was not detected in any water samples except 20B1-W which contained TPH-G at a concentration of 140 ug/L, below the MTCA A CUL of 1,000 ug/L. No BTEX compounds were detected in any of the water samples.

Seven of the nine groundwater samples contained TPH in the diesel and oil range. Concentrations in the four samples from the northeast corner of the Subject Property near SB-8 (20B1 through 20B4) were slightly above the MTCA Method A cleanup criteria of 500 ug/L. However, chromatograms for the groundwater samples with detections show a smooth peak extending over and overlapping both the diesel and oil ranges. Because some of the soils were observed to have a high organic content (peat), it was suspected that these results likely reflect some biogenic interference. Chromatograms of example fuels are provided in Attachment C for reference.

The samples with detected TPH in the diesel and/or oil range were reanalyzed using a silica gel/acid cleanup technique (Ecology 1997; 2016). The laboratory test method NWTPH-Dx quantifies non-polar petroleum hydrocarbon compounds and also polar organic compounds such as oxygen, nitrogen, sulfur organic acids, alcohols, ketones, phenols, and organic matter. The silica gel/acid cleanup technique removes polar compounds including natural organic matter and also some metabolites from the biodegradation of petroleum so that non-polar petroleum hydrocarbons are not absorbed by the silica gel and are more accurately quantitated.

Ecology's Publication No. 10-09-057, revised June 2016, states the following regarding the use of silica gel cleanup in the analysis of groundwater samples for petroleum hydrocarbons: "Silica gel cleanup should not be used for NWTPH-Dx analyses of groundwater samples unless uncontaminated background samples indicate that naturally occurring organic matter is a significant component of the TPH being detected in the groundwater samples. If silica gel cleanup is used, groundwater samples should be split and analyzed both with and without silica gel cleanup."

The laboratory report with the results of the reanalyses is presented in Attachment C. No diesel or oil-range TPH were detected in any of the seven groundwater samples reanalyzed using silica gel/acid cleanup. These data support the interpretation that the diesel and oil-range concentrations detected in groundwater in this investigation and in previous sampling of well SB-8 likely have very strong biogenic interferences. This interpretation is consistent with observations of organic soils observed during this investigation and with published geologic mapping of the Subject Property (Troost et al 2005) that shows surficial soils as peat.

The results from this investigation without silica gel/acid cleanup ranged from slightly above to slightly below the MTCA Method A CUL (250 to 570 ug/L). Biogenic interference in the petroleum analysis from the naturally occurring peat at the Subject Property is likely greater than 100 ug/L. With the silica gel/acid cleanup analysis showing no non-polar material (petroleum products) detected in the samples, and with the historical assessment of the property showing no known contamination sources in the area surrounding SB-8, weathered petroleum, if present in the groundwater samples from this investigation, is likely below the MTCA Method A CUL of 500 ug/L.

CONCLUSIONS

- Diesel and oil-range hydrocarbons were present in groundwater in seven of the nine samples. The four samples in the northeastern portion of the Subject property had concentrations greater than the MTCA Method A CULs.
- The TPH detected in groundwater is believed to primarily reflect biogenic interference because it was removed by silica gel/acid cleanup. This interpretation is consistent with the geologic mapping as peat and the observations of organic soil during this investigation.
- If highly organic soils (peat) were not present at the site, the results from the investigation likely would be below MTCA Method A CULs since the magnitudes of the exceedances are less than the values expected to be attributable to biogenic interference.
- Historical sample results for TPH in groundwater from well SB-8 likely were also affected by biogenic interference.
- No downgradient contamination above MTCA Method A CULs was observed in the one boring downgradient from the former tank area (20B8).
- Based on the results of this investigation, migration of petroleum hydrocarbons in groundwater from the Subject Property has not impacted the neighboring King County Metro South Base Annex to the east.

RECOMMENDATIONS

We understand that Phase II site assessment activities are on-going related to the redevelopment of the neighboring South Base Annex property to the east. Surficial materials at the South Base Annex are also mapped as Quaternary peat, and analysis of petroleum hydrocarbons in that area should be performed both with and without silica gel/acid cleanup treatment. Additional analysis of total organic carbon (TOC) may be also helpful in determining the level of dissolved organic material within the local groundwater below the South Facilities. Compliance with MTCA CULs should take into account the level of biogenic interference from the native peat.

Ecology's Manchester Laboratory is leading the analysis of compliance at sites where strong biogenic interference is suspected such as the South Facility where Quaternary peat is mapped. King County Metro, being a publicly funded agency, is eligible to submit samples directly to the Manchester Laboratory in the future. This may be important for determining compliance with MTCA CULs at the Subject Property and could facilitate Ecology's reevaluation of the SHA ranking of 1.

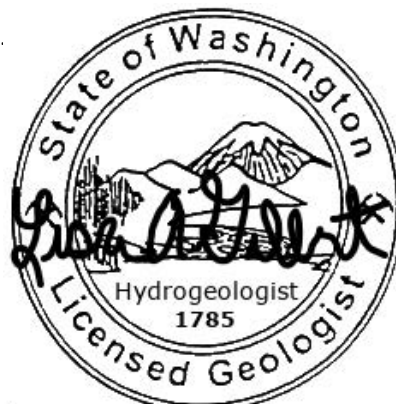
Please contact me at (206)394-3667 if you have any questions.

Sincerely,



Lisa Gilbert, LG, LHG

cc: Mark Mazzola, Parametrix Project Manager



Lisa A. Gilbert

REFERENCES

- AGI Technologies. 1997. Underground Storage Tank Closure Assessment Report, Facilities Maintenance South UST Project. Prepared for King County Water Pollution Control Division, Design and Construction Services, Seattle, Washington. June 18.
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- King County GIS Center iMAP application, Property Information, Groundwater Program, and Sensitive Areas map sets. <http://www.kingcounty.gov/operations/GIS/Maps/iMAP.aspx> Accessed September 2019.
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- PBS, Inc. 2020. Groundwater Sampling at King County Metro South Base Facilities, 11911 E. Marginal Way S., Seattle WA 98168. Prepared for King County Metro Transit. January 10.
- Troost, Booth, Wisher, and Shimel. 2005. Geologic Map of Seattle – a Progress Report, U.S. Geologic Survey Open File Report 2005-1252, Prepared in cooperation with the City of Seattle and the Pacific Northwest Center for Geologic Mapping Studies at the Department of Earth and Space Sciences, University of Washington.
- U.S. Geological Survey (USGS). 2017. Des Moines Quadrangle, Washington-King County, 7.5-minute series topographic map.
- Woodward-Clyde. 1995. Pre-Construction Site Assessment Report, South Operating Base Facility Annex. Prepared for King County Department of Metropolitan Services, Seattle, Washington. January.

FIGURES

- 1 Site Location Map
- 2 Boring Locations

TABLES

- 1 Groundwater Elevations
- 2 Results of Laboratory Analyses

ATTACHMENTS

- A Boring Log Table
- B Subject Property Photographs
- C Laboratory Reports

Figures



Service Credits: Pictometry, King County
Sources: Esri, DeLorme, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRI, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

Date: 10/10/2019 Author: worshlav Path: U:\PSO\Projects\Clients\1521-KingCo\554-1521-214 EnviroTransit\T1\Call199Sves\GIS\MapDocs\South Base_VicinityMap.mxd



Parametrix
Source: King County

Project Location — Stream



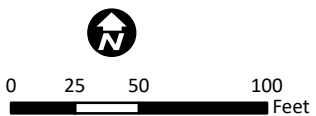
0 50 100 200
Feet

Figure 1
Site Location Map
King County Metro Transit South Base Facility Annex

Tukwila, WA



Source: King County



- Project Location
- ◆ Monitoring Well Location (approx.)
- Boring Location (approx.)

Figure 2
Boring Locations
King County Metro Transit South Base Facility Annex

Tukwila, WA

Tables



Table 1. Groundwater Elevations, King County Metro South Facilities, 11911 E Marginal Way S, Tukwila, WA.

Well	Reference Elevation ¹	September 23, 2019		December 17, 2019		April 1, 2020	
		Depth to Groundwater (ft)	Groundwater Elevation (ft NAVD88)	Depth to Groundwater (ft)	Groundwater Elevation (ft NAVD88)	Depth to Groundwater (ft)	Groundwater Elevation (ft NAVD88)
DW-3*	13.63	5.21	8.42	4.84	8.79	4.48	9.15
DW-4	14.00	5.58	8.42	5.15	8.85	4.82	9.18
SB-7	14.05	5.66	8.39	5.23	8.82	4.86	9.19
SB-8	14.19	6.28	7.91	5.80	8.39	5.33	8.86

Notes:

¹ N rim PVC in ft NAVD88**

*Well has been damaged and casing is not vertical

Table 2. Push Probe Investigation Results, April 1, 2020, King County Metro South Facilities, 11911 E Marginal Way S, Tukwila, WA.

Groundwater (mg/L)

Sample ID	TPH-Diesel	TPH-Heavy Oil	TPH-Gasoline	Benzene	Toluene	Ethylbenzene	Toluene
	mg/L				ug/L		
20B1-W	<0.23	0.52	<100	<1	<1	<1	<1
reanalysis*	<0.22	<0.22	NA	NA	NA	NA	NA
20B2-W	0.24	0.27	140	<1	<1	<1	<1
reanalysis*	<0.22	<0.22	NA	NA	NA	NA	NA
20B3-W	<0.23	0.57	<100	<1	<1	<1	<1
reanalysis*	<0.23	<0.23	NA	NA	NA	NA	NA
20B4-W	<0.25	0.53	<100	<1	<1	<1	<1
reanalysis*	<0.25	<0.25	NA	NA	NA	NA	NA
20B5-W	<0.24	0.25	<100	<1	<1	<1	<1
reanalysis*	<0.24	<0.24	NA	NA	NA	NA	NA
20B6-W	<0.24	<0.24	<100	<1	<1	<1	<1
20B7-W	<0.22	0.49	<100	<1	<1	<1	<1
reanalysis*	<0.22	<0.22	NA	NA	NA	NA	NA
20B8-W	<0.24	0.43	<100	<1	<1	<1	<1
reanalysis*	<0.24	<0.24	NA	NA	NA	NA	NA
20B9-W	<0.24	<0.24	<100	<1	<1	<1	<1
MTCA Method A Cleanup Level							
	0.5	0.5	1000	5	1000	700	1000
Soil (mg/kg)							
20B1-5	<32	68	NA	NA	NA	NA	NA
20B2-3.5	<43	<86	NA	NA	NA	NA	NA
20B3-4.5	<32	<64	NA	NA	NA	NA	NA
20B4-4.5	<31	<62	NA	NA	NA	NA	NA
MTCA Method A Cleanup Level							
	2000	2000					

concentration is above Model Toxics Control Act WAC 173-340 (MTCA) Method A Cleanup Level

Gasoline cleanup level is presented for the circumstance in which benzene is not detected

*Reanalysis after silica gel/acid cleanup

NA = not analyzed

Attachment A

Boring Log Table



BORING LOG SUMMARY - King County Metro South Facilities, April 1, 2020																																					
		Depth (feet)																																			
BORING ID		0	0.5	1	1.5	2	2.5	3	3.5	4	4.5	5	5.5	6	6.5	7	7.5	8	8.5	9	9.5	10	10.5	11	11.5	12	12.5	13	13.5	14	14.5	15					
		Description of Materials, Samples, and Recovery																																			
20B1	Description	Concrete	Gray Sand and Gravel, Fill					Black to Brown Silt and Clayey Silt with organics, peat, moist to wet															Black Fine Sand and Gray Silt, water-bearing (interpreted, no recovery)								Bottom @ 15 ft						
	Recovery (ft)	60%											80%										0%														
	Sample ID	20B1-5															20B1-W																				
20B2	Description	Concrete	Gr.-Br. Sand and Gravel, Fill				Black Silt, moist to wet				Gray Sandy Silt, wet				Brown Silt, Clayey Silt, peat, moist		Black Sand, W.B.	Brown Silt, Clayey Silt, moist	Black Fine to Medium Sand, water-bearing (W.B.)				Gray Sandy Silt, wet		Black Fine to Medium Sand, water-bearing				Bottom @ 15 ft								
	Recovery (ft)	40%											100%										100%														
	Sample ID	20B2-W																																			
		0	0.5	1	1.5	2	2.5	3	3.5	4	4.5	5	5.5	6	6.5	7	7.5	8	8.5	9	9.5	10	10.5	11	11.5	12	12.5	13	13.5	14	14.5	15					
20B3	Description	Concrete	Gray Sand and Gravel, Fill					Black to Brown Silt and Clayey Silt with organics, peat, moist to wet			Gray Sandy Silt, wet				Brown Silt, Clayey Silt, peat, moist						Gray Silty Sand and Gravel, wet		Brown Silt with organics, moist		Gray Fine Sand grading to Sandy Silt, water-bearing			Gray Fine to Medium Sand, water-bearing		Bottom @ 15 ft							
	Recovery (ft)	60%											95%										100%														
	Sample ID	20B3-4.5													20B3-W																						
20B4	Description	Concrete	Gray Sand and Gravel, Fill				Brown-Gray Silt, moist			Black Fine Sand, water-bearing						Black-Brown Silt, Clayey Silt, peat, moist to wet					Bottom @ 10 ft																
	Recovery (ft)	60%											100%																								
	Sample ID	20B4-4.5													20B4-W																						
		0	0.5	1	1.5	2	2.5	3	3.5	4	4.5	5	5.5	6	6.5	7	7.5	8	8.5	9	9.5	10	10.5	11	11.5	12	12.5	13	13.5	14	14.5	15					
20B5	Description	Concrete	Brown-Gray Sand and Gravel, Fill											Brown Silt, Clayey Silt, with organics, peat, moist		Gray Silt and Sandy Silt, occassional clay, moist/wet						Gray Silt, some Sandy Silt, wet				Black Fine Sand to Silty Sand, water-bearing		Gray Silt, some Sandy Silt, wet			Black Fine Sand, W.B.		Bottom @ 15 ft				
	Recovery (ft)	60%											100%										100%														
	Sample ID	20B5-W																																			
B20B6	Description	Concrete	Gray Sand and Gravel, Fill											Black-Gray Silt, moist to wet						Gray Silty Sand and Gravel, wet		Brown Silt, Clayey Silt, peat, wet			Black F. - M. Sand, W.B.	Gray Sandy Silt, wet		Black Fine to Medium Sand, water-bearing		Bottom @ 15 ft							
	Recovery (ft)	60%											70%										80%														
	Sample ID	20B6-7															20B6-W																				

BORING LOG SUMMARY - King County Metro South Facilities, April 1, 2020																																
		Depth (feet)																														
BORING ID		0	0.5	1	1.5	2	2.5	3	3.5	4	4.5	5	5.5	6	6.5	7	7.5	8	8.5	9	9.5	10	10.5	11	11.5	12	12.5	13	13.5	14	14.5	15
		Description of Materials, Samples, and Recovery																														
20B7	Description	Concrete	Gray Sand and Gravel, Fill										Gray Silt, moist (interpreted, no recovery)							Brown-Gray Silt, wet					Black Fine Sand, water-bearing	Gray Sandy Silt, wet	Black Fine Sand, W.B.	Bottom @ 15 ft				
	Recovery (ft)	50%										0%							100%													
	Sample ID	20B7-W																														
20B8	Description	Concrete	Gray Sand and Gravel, Fill					Gray Silt, moist to wet				Brown Silt, Clayey Silt, with organics,peat, moist						Black Fine Sand to Sandy Silt, water-bearing						Gray Silt, wet			Black Fine Sand, W.B.	Bottom @ 15 ft				
	Recovery (ft)	60%										90%							100%													
	Sample ID	20B8-4														20B8-W																
		0	0.5	1	1.5	2	2.5	3	3.5	4	4.5	5	5.5	6	6.5	7	7.5	8	8.5	9	9.5	10	10.5	11	11.5	12	12.5	13	13.5	14	14.5	15
20B9	Description	Concrete	Gray Sand and Gravel, Fill										Brown-Gray Silt, Clayey Silt, with organics, peat, wet										Black Fine Sand, water bearing	Gray Silt, Clayey Silt, wet			Black Fine Sand, W.B.	Bottom @ 15 ft				
	Recovery (ft)	60%										100%							100%													
	Sample ID	20B9-W																														

Attachment B
Subject Property Photographs





1. Location of 20B1 on the northeast portion of the site. SB-8 located just west below the garbage container.



2. Soil cores obtained from 20B1. Silt and Clayey Silt with organics typical of peat soils directly below the shallow fill.



3. Location of 20B2 north of the building.



4. Soil cores obtained from 20B2. Silt, Clayey Silt, and peat below the fill (top and middle) with alluvial sands at depth (bottom).



5. Location of 20B3 west of the Subject Property boundary and south of SB-8.



6. Soil cores obtained from 20B3. Similar lithology to previous boreholes.



7. Location of 20B4 west of SB-8.



8. Soil cores obtained from 20B4. A thin layers of silt is below the fill prior to encountering alluvial sands, seen shallower at 20B4 at approximately 4.5 feet below ground (lower right).



9. Location of 20B5 along the eastern boundary of the Subject Property.



10. Soil cores obtained from 20B5. The fill was observed deeper down to 6 feet below ground prior to encountering the peat deposits (bottom and middle).



11. Location of 20B6 further north than 20B5 along the eastern boundary of the Subject Property.



12. Soil cores obtained from 20B6. The fill extends further down to 7 feet below ground prior to encountering the peat deposits (bottom and middle) with alluvial sands at depth (top).



13. Location of 20B7 located south of the eastern building extension on the Subject Property.



14. Soil cores obtained from 20B7. No recovery from 5 to 10 feet. Peat deposits observed down to 12 feet below ground prior to encountering alluvial sands (top).



15. Location of 20B8 northwest of the UST area. DW-3 if the foreground.



16. Soil cores obtained from 20B8. Primarily peat and silt deposits below the fill (bottom, middle) prior to encountering alluvial sands (top).



17. Location of 20B9 south of the building and east of the UST area.



18. Soil cores obtained from 20B9. Peat and silt observed from 6 to 12 feet (middle) prior to encountering alluvial sands (bottom).

Attachment C

Laboratory Reports





14648 NE 95th Street, Redmond, WA 98052 • (425) 883-3881

April 7, 2020

Lisa Gilbert
Parametrix
719 2nd Avenue, Suite 200
Seattle, WA 98104

Re: Analytical Data for Project 553-1521-242-01
Laboratory Reference No. 2004-019

Dear Lisa:

Enclosed are the analytical results and associated quality control data for samples submitted on April 2, 2020.

The standard policy of OnSite Environmental, Inc. is to store your samples for 30 days from the date of receipt. If you require longer storage, please contact the laboratory.

We appreciate the opportunity to be of service to you on this project. If you have any questions concerning the data, or need additional information, please feel free to call me.

Sincerely,

A handwritten signature in black ink, appearing to read 'DeB' followed by a stylized flourish.

David Baumeister
Project Manager

Enclosures



OnSite Environmental, Inc. 14648 NE 95th Street, Redmond, WA 98052 (425) 883-3881

This report pertains to the samples analyzed in accordance with the chain of custody, and is intended only for the use of the individual or company to whom it is addressed.

Date of Report: April 7, 2020
Samples Submitted: April 2, 2020
Laboratory Reference: 2004-019
Project: 553-1521-242-01

Case Narrative

Samples were collected on April 1, 2020 and received by the laboratory on April 2, 2020. They were maintained at the laboratory at a temperature of 2°C to 6°C.

Please note that any and all soil sample results are reported on a dry-weight basis, unless otherwise noted below.

General QA/QC issues associated with the analytical data enclosed in this laboratory report will be indicated with a reference to a comment or explanation on the Data Qualifier page. More complex and involved QA/QC issues will be discussed in detail below.

NWTPH-Gx/BTEX Analysis

The gasoline result for sample 20B2-W is mainly attributed to a single, unidentified peak.

Any other QA/QC issues associated with this extraction and analysis will be indicated with a footnote reference and discussed in detail on the Data Qualifier page.



Date of Report: April 7, 2020
 Samples Submitted: April 2, 2020
 Laboratory Reference: 2004-019
 Project: 553-1521-242-01

**GASOLINE RANGE ORGANICS/BTEX
 NWTPH-Gx/EPA 8021B**

Matrix: Water
 Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	20B1-W					
Laboratory ID:	04-019-02					
Benzene	ND	1.0	EPA 8021B	4-6-20	4-6-20	
Toluene	ND	1.0	EPA 8021B	4-6-20	4-6-20	
Ethyl Benzene	ND	1.0	EPA 8021B	4-6-20	4-6-20	
m,p-Xylene	ND	1.0	EPA 8021B	4-6-20	4-6-20	
o-Xylene	ND	1.0	EPA 8021B	4-6-20	4-6-20	
Gasoline	ND	100	NWTPH-Gx	4-6-20	4-6-20	
<i>Surrogate:</i>	<i>Percent Recovery</i>	<i>Control Limits</i>				
<i>Fluorobenzene</i>	104	59-122				
Client ID:	20B2-W					
Laboratory ID:	04-019-04					
Benzene	ND	1.0	EPA 8021B	4-6-20	4-6-20	
Toluene	ND	1.0	EPA 8021B	4-6-20	4-6-20	
Ethyl Benzene	ND	1.0	EPA 8021B	4-6-20	4-6-20	
m,p-Xylene	ND	1.0	EPA 8021B	4-6-20	4-6-20	
o-Xylene	ND	1.0	EPA 8021B	4-6-20	4-6-20	
Gasoline	140	100	NWTPH-Gx	4-6-20	4-6-20	Z
<i>Surrogate:</i>	<i>Percent Recovery</i>	<i>Control Limits</i>				
<i>Fluorobenzene</i>	100	59-122				
Client ID:	20B3-W					
Laboratory ID:	04-019-06					
Benzene	ND	1.0	EPA 8021B	4-6-20	4-6-20	
Toluene	ND	1.0	EPA 8021B	4-6-20	4-6-20	
Ethyl Benzene	ND	1.0	EPA 8021B	4-6-20	4-6-20	
m,p-Xylene	ND	1.0	EPA 8021B	4-6-20	4-6-20	
o-Xylene	ND	1.0	EPA 8021B	4-6-20	4-6-20	
Gasoline	ND	100	NWTPH-Gx	4-6-20	4-6-20	
<i>Surrogate:</i>	<i>Percent Recovery</i>	<i>Control Limits</i>				
<i>Fluorobenzene</i>	99	59-122				



Date of Report: April 7, 2020
 Samples Submitted: April 2, 2020
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 Project: 553-1521-242-01

**GASOLINE RANGE ORGANICS/BTEX
 NWTPH-Gx/EPA 8021B**

Matrix: Water
 Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	20B4-W					
Laboratory ID:	04-019-08					
Benzene	ND	1.0	EPA 8021B	4-6-20	4-6-20	
Toluene	ND	1.0	EPA 8021B	4-6-20	4-6-20	
Ethyl Benzene	ND	1.0	EPA 8021B	4-6-20	4-6-20	
m,p-Xylene	ND	1.0	EPA 8021B	4-6-20	4-6-20	
o-Xylene	ND	1.0	EPA 8021B	4-6-20	4-6-20	
Gasoline	ND	100	NWTPH-Gx	4-6-20	4-6-20	
<i>Surrogate:</i>	<i>Percent Recovery</i>	<i>Control Limits</i>				
<i>Fluorobenzene</i>	100	59-122				
Client ID:	20B5-W					
Laboratory ID:	04-019-09					
Benzene	ND	1.0	EPA 8021B	4-6-20	4-6-20	
Toluene	ND	1.0	EPA 8021B	4-6-20	4-6-20	
Ethyl Benzene	ND	1.0	EPA 8021B	4-6-20	4-6-20	
m,p-Xylene	ND	1.0	EPA 8021B	4-6-20	4-6-20	
o-Xylene	ND	1.0	EPA 8021B	4-6-20	4-6-20	
Gasoline	ND	100	NWTPH-Gx	4-6-20	4-6-20	
<i>Surrogate:</i>	<i>Percent Recovery</i>	<i>Control Limits</i>				
<i>Fluorobenzene</i>	98	59-122				
Client ID:	20B6-W					
Laboratory ID:	04-019-11					
Benzene	ND	1.0	EPA 8021B	4-6-20	4-6-20	
Toluene	ND	1.0	EPA 8021B	4-6-20	4-6-20	
Ethyl Benzene	ND	1.0	EPA 8021B	4-6-20	4-6-20	
m,p-Xylene	ND	1.0	EPA 8021B	4-6-20	4-6-20	
o-Xylene	ND	1.0	EPA 8021B	4-6-20	4-6-20	
Gasoline	ND	100	NWTPH-Gx	4-6-20	4-6-20	
<i>Surrogate:</i>	<i>Percent Recovery</i>	<i>Control Limits</i>				
<i>Fluorobenzene</i>	100	59-122				



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**GASOLINE RANGE ORGANICS/BTEX
 NWTPH-Gx/EPA 8021B**

Matrix: Water
 Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	20B7-W					
Laboratory ID:	04-019-12					
Benzene	ND	1.0	EPA 8021B	4-6-20	4-6-20	
Toluene	ND	1.0	EPA 8021B	4-6-20	4-6-20	
Ethyl Benzene	ND	1.0	EPA 8021B	4-6-20	4-6-20	
m,p-Xylene	ND	1.0	EPA 8021B	4-6-20	4-6-20	
o-Xylene	ND	1.0	EPA 8021B	4-6-20	4-6-20	
Gasoline	ND	100	NWTPH-Gx	4-6-20	4-6-20	
<i>Surrogate:</i>	<i>Percent Recovery</i>	<i>Control Limits</i>				
<i>Fluorobenzene</i>	99	59-122				
Client ID:	20B8-W					
Laboratory ID:	04-019-14					
Benzene	ND	1.0	EPA 8021B	4-6-20	4-6-20	
Toluene	ND	1.0	EPA 8021B	4-6-20	4-6-20	
Ethyl Benzene	ND	1.0	EPA 8021B	4-6-20	4-6-20	
m,p-Xylene	ND	1.0	EPA 8021B	4-6-20	4-6-20	
o-Xylene	ND	1.0	EPA 8021B	4-6-20	4-6-20	
Gasoline	ND	100	NWTPH-Gx	4-6-20	4-6-20	
<i>Surrogate:</i>	<i>Percent Recovery</i>	<i>Control Limits</i>				
<i>Fluorobenzene</i>	98	59-122				
Client ID:	20B9-W					
Laboratory ID:	04-019-15					
Benzene	ND	1.0	EPA 8021B	4-6-20	4-6-20	
Toluene	ND	1.0	EPA 8021B	4-6-20	4-6-20	
Ethyl Benzene	ND	1.0	EPA 8021B	4-6-20	4-6-20	
m,p-Xylene	ND	1.0	EPA 8021B	4-6-20	4-6-20	
o-Xylene	ND	1.0	EPA 8021B	4-6-20	4-6-20	
Gasoline	ND	100	NWTPH-Gx	4-6-20	4-6-20	
<i>Surrogate:</i>	<i>Percent Recovery</i>	<i>Control Limits</i>				
<i>Fluorobenzene</i>	100	59-122				



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**GASOLINE RANGE ORGANICS/BTEX
 NWTPH-Gx/EPA 8021B
 QUALITY CONTROL**

Matrix: Water
 Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB0406W1					
Benzene	ND	1.0	EPA 8021B	4-6-20	4-6-20	
Toluene	ND	1.0	EPA 8021B	4-6-20	4-6-20	
Ethyl Benzene	ND	1.0	EPA 8021B	4-6-20	4-6-20	
m,p-Xylene	ND	1.0	EPA 8021B	4-6-20	4-6-20	
o-Xylene	ND	1.0	EPA 8021B	4-6-20	4-6-20	
Gasoline	ND	100	NWTPH-Gx	4-6-20	4-6-20	
Surrogate:	Percent Recovery	Control Limits				
Fluorobenzene	110	59-122				

Analyte	Result	Spike Level	Source Result	Percent Recovery	Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE								
Laboratory ID:	04-019-02							
	ORIG	DUP						
Benzene	ND	ND	NA	NA	NA	NA	NA	30
Toluene	ND	ND	NA	NA	NA	NA	NA	30
Ethyl Benzene	ND	ND	NA	NA	NA	NA	NA	30
m,p-Xylene	ND	ND	NA	NA	NA	NA	NA	30
o-Xylene	ND	ND	NA	NA	NA	NA	NA	30
Gasoline	ND	ND	NA	NA	NA	NA	NA	30
Surrogate:								
Fluorobenzene			104	102	59-122			

SPIKE BLANKS

Laboratory ID:	SB0406W1								
	SB	SBD	SB	SBD	SB	SBD			
Benzene	54.0	54.2	50.0	50.0	108	108	76-120	0	11
Toluene	54.4	54.9	50.0	50.0	109	110	80-116	1	12
Ethyl Benzene	54.0	54.9	50.0	50.0	108	110	80-116	2	12
m,p-Xylene	53.5	54.5	50.0	50.0	107	109	76-117	2	12
o-Xylene	52.9	53.4	50.0	50.0	106	107	79-114	1	11
Surrogate:									
Fluorobenzene			101	101	59-122				



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**DIESEL AND HEAVY OIL RANGE ORGANICS
 NWTPH-Dx**

Matrix: Soil
 Units: mg/Kg (ppm)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	20B1-5					
Laboratory ID:	04-019-01					
Diesel Range Organics	ND	32	NWTPH-Dx	4-3-20	4-3-20	
Lube Oil Range Organics	68	63	NWTPH-Dx	4-3-20	4-3-20	
<i>Surrogate:</i>	<i>Percent Recovery</i>	<i>Control Limits</i>				
<i>o-Terphenyl</i>	84	50-150				

Client ID:	20B2-3.5					
Laboratory ID:	04-019-03					
Diesel Range Organics	ND	43	NWTPH-Dx	4-3-20	4-3-20	
Lube Oil Range Organics	ND	86	NWTPH-Dx	4-3-20	4-3-20	
<i>Surrogate:</i>	<i>Percent Recovery</i>	<i>Control Limits</i>				
<i>o-Terphenyl</i>	83	50-150				

Client ID:	20B3-4.5					
Laboratory ID:	04-019-05					
Diesel Range Organics	ND	32	NWTPH-Dx	4-3-20	4-3-20	
Lube Oil Range Organics	ND	64	NWTPH-Dx	4-3-20	4-3-20	
<i>Surrogate:</i>	<i>Percent Recovery</i>	<i>Control Limits</i>				
<i>o-Terphenyl</i>	86	50-150				

Client ID:	20B4-4.5					
Laboratory ID:	04-019-07					
Diesel Range Organics	ND	31	NWTPH-Dx	4-3-20	4-3-20	
Lube Oil Range Organics	ND	62	NWTPH-Dx	4-3-20	4-3-20	
<i>Surrogate:</i>	<i>Percent Recovery</i>	<i>Control Limits</i>				
<i>o-Terphenyl</i>	88	50-150				



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**DIESEL AND HEAVY OIL RANGE ORGANICS
 NWTPH-Dx
 QUALITY CONTROL**

Matrix: Soil
 Units: mg/Kg (ppm)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB0403S1					
Diesel Range Organics	ND	25	NWTPH-Dx	4-3-20	4-3-20	
Lube Oil Range Organics	ND	50	NWTPH-Dx	4-3-20	4-3-20	
<i>Surrogate:</i>	<i>Percent Recovery</i>	<i>Control Limits</i>				
<i>o-Terphenyl</i>	96	50-150				

Analyte	Result		Spike Level		Source Result	Percent Recovery	Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE										
Laboratory ID:	04-017-01									
	ORIG	DUP								
Diesel Range	ND	ND	NA	NA		NA	NA	NA	NA	
Lube Oil Range	ND	ND	NA	NA		NA	NA	NA	NA	
Surrogate:										
o-Terphenyl						69	78	50-150		



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**DIESEL AND HEAVY OIL RANGE ORGANICS
 NWTPH-Dx**

Matrix: Water
 Units: mg/L (ppm)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	20B1-W					
Laboratory ID:	04-019-02					
Diesel Range Organics	ND	0.23	NWTPH-Dx	4-3-20	4-6-20	
Lube Oil Range Organics	0.52	0.23	NWTPH-Dx	4-3-20	4-6-20	
<i>Surrogate:</i>	<i>Percent Recovery</i>	<i>Control Limits</i>				
<i>o-Terphenyl</i>	97	50-150				

Client ID:	20B2-W					
Laboratory ID:	04-019-04					
Diesel Range Organics	0.24	0.23	NWTPH-Dx	4-3-20	4-6-20	
Lube Oil Range Organics	0.27	0.23	NWTPH-Dx	4-3-20	4-6-20	
<i>Surrogate:</i>	<i>Percent Recovery</i>	<i>Control Limits</i>				
<i>o-Terphenyl</i>	89	50-150				

Client ID:	20B3-W					
Laboratory ID:	04-019-06					
Diesel Range Organics	ND	0.23	NWTPH-Dx	4-3-20	4-6-20	
Lube Oil Range Organics	0.57	0.23	NWTPH-Dx	4-3-20	4-6-20	
<i>Surrogate:</i>	<i>Percent Recovery</i>	<i>Control Limits</i>				
<i>o-Terphenyl</i>	97	50-150				

Client ID:	20B4-W					
Laboratory ID:	04-019-08					
Diesel Range Organics	ND	0.25	NWTPH-Dx	4-3-20	4-6-20	
Lube Oil Range Organics	0.53	0.25	NWTPH-Dx	4-3-20	4-6-20	
<i>Surrogate:</i>	<i>Percent Recovery</i>	<i>Control Limits</i>				
<i>o-Terphenyl</i>	95	50-150				

Client ID:	20B5-W					
Laboratory ID:	04-019-09					
Diesel Range Organics	ND	0.24	NWTPH-Dx	4-3-20	4-6-20	
Lube Oil Range Organics	0.25	0.24	NWTPH-Dx	4-3-20	4-6-20	
<i>Surrogate:</i>	<i>Percent Recovery</i>	<i>Control Limits</i>				
<i>o-Terphenyl</i>	89	50-150				

Client ID:	20B6-W					
Laboratory ID:	04-019-11					
Diesel Range Organics	ND	0.24	NWTPH-Dx	4-3-20	4-6-20	
Lube Oil Range Organics	ND	0.24	NWTPH-Dx	4-3-20	4-6-20	
<i>Surrogate:</i>	<i>Percent Recovery</i>	<i>Control Limits</i>				
<i>o-Terphenyl</i>	93	50-150				



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DIESEL AND HEAVY OIL RANGE ORGANICS
NWTPH-Dx

Matrix: Water
 Units: mg/L (ppm)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	20B7-W					
Laboratory ID:	04-019-12					
Diesel Range Organics	ND	0.22	NWTPH-Dx	4-3-20	4-6-20	
Lube Oil Range Organics	0.49	0.22	NWTPH-Dx	4-3-20	4-6-20	
<i>Surrogate:</i>	<i>Percent Recovery</i>	<i>Control Limits</i>				
<i>o-Terphenyl</i>	86	50-150				

Client ID:	20B8-W					
Laboratory ID:	04-019-14					
Diesel Range Organics	ND	0.24	NWTPH-Dx	4-3-20	4-6-20	
Lube Oil Range Organics	0.43	0.24	NWTPH-Dx	4-3-20	4-6-20	
<i>Surrogate:</i>	<i>Percent Recovery</i>	<i>Control Limits</i>				
<i>o-Terphenyl</i>	100	50-150				

Client ID:	20B9-W					
Laboratory ID:	04-019-15					
Diesel Range Organics	ND	0.22	NWTPH-Dx	4-3-20	4-6-20	
Lube Oil Range Organics	ND	0.22	NWTPH-Dx	4-3-20	4-6-20	
<i>Surrogate:</i>	<i>Percent Recovery</i>	<i>Control Limits</i>				
<i>o-Terphenyl</i>	89	50-150				



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**DIESEL AND HEAVY OIL RANGE ORGANICS
 NWTPH-Dx
 QUALITY CONTROL**

Matrix: Water
 Units: mg/L (ppm)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB0403W1					
Diesel Range Organics	ND	0.20	NWTPH-Dx	4-3-20	4-6-20	
Lube Oil Range Organics	ND	0.20	NWTPH-Dx	4-3-20	4-6-20	
Surrogate:	Percent Recovery	Control Limits				
o-Terphenyl	99	50-150				

Analyte	Result		Spike Level		Source Result	Percent Recovery	Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE										
Laboratory ID:	04-019-02									
	ORIG	DUP								
Diesel Range	ND	ND	NA	NA		NA	NA	NA	NA	
Lube Oil Range Organics	0.523	0.387	NA	NA		NA	NA	30	NA	
Surrogate:										
o-Terphenyl						97	83	50-150		



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% MOISTURE

Client ID	Lab ID	% Moisture	Date Analyzed
20B1-5	04-019-01	29	4-3-20
20B2-3.5	04-019-03	42	4-3-20
20B3-4.5	04-019-05	22	4-3-20
20B4-4.5	04-019-07	19	4-3-20





Data Qualifiers and Abbreviations

- A - Due to a high sample concentration, the amount spiked is insufficient for meaningful MS/MSD recovery data.
 - B - The analyte indicated was also found in the blank sample.
 - C - The duplicate RPD is outside control limits due to high result variability when analyte concentrations are within five times the quantitation limit.
 - E - The value reported exceeds the quantitation range and is an estimate.
 - F - Surrogate recovery data is not available due to the high concentration of coeluting target compounds.
 - H - The analyte indicated is a common laboratory solvent and may have been introduced during sample preparation, and be impacting the sample result.
 - I - Compound recovery is outside of the control limits.
 - J - The value reported was below the practical quantitation limit. The value is an estimate.
 - K - Sample duplicate RPD is outside control limits due to sample inhomogeneity. The sample was re-extracted and re-analyzed with similar results.
 - L - The RPD is outside of the control limits.
 - M - Hydrocarbons in the gasoline range are impacting the diesel range result.
 - M1 - Hydrocarbons in the gasoline range (toluene-naphthalene) are present in the sample.
 - N - Hydrocarbons in the lube oil range are impacting the diesel range result.
 - N1 - Hydrocarbons in diesel range are impacting lube oil range results.
 - O - Hydrocarbons indicative of heavier fuels are present in the sample and are impacting the gasoline result.
 - P - The RPD of the detected concentrations between the two columns is greater than 40.
 - Q - Surrogate recovery is outside of the control limits.
 - S - Surrogate recovery data is not available due to the necessary dilution of the sample.
 - T - The sample chromatogram is not similar to a typical _____.
 - U - The analyte was analyzed for, but was not detected above the reported sample quantitation limit.
 - U1 - The practical quantitation limit is elevated due to interferences present in the sample.
 - V - Matrix Spike/Matrix Spike Duplicate recoveries are outside control limits due to matrix effects.
 - W - Matrix Spike/Matrix Spike Duplicate RPD are outside control limits due to matrix effects.
 - X - Sample extract treated with a mercury cleanup procedure.
 - X1 - Sample extract treated with a sulfuric acid/silica gel cleanup procedure.
 - Y - The calibration verification for this analyte exceeded the 20% drift specified in methods 8260 & 8270, and therefore the reported result should be considered an estimate. The overall performance of the calibration verification standard met the acceptance criteria of the method.
 - Z - The gasoline result is mainly attributed to a single, unidentified peak.
- ND - Not Detected at PQL
 PQL - Practical Quantitation Limit
 RPD - Relative Percent Difference





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Chain of Custody

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ENVIRONMENTAL INC. Analytical Laboratory Testing Services 14648 NE 95th Street • Redmond, WA 98052 Phone: (425) 883-3881 • www.on-site-env.com						
Turnaround Request (in working days)						
(Check One) ☐ Same Day ☐ 1 Day ☐ 2 Days ☐ 3 Days ☒ Standard (7 Days)						
Number of Containers						
Laboratory Number: 04-019						
NWTPH-HCID						
NWTPH-Gx/BTEX						
NWTPH-Gx						
NWTPH-Dx (☐ Acid / SG Clean-up)						
Volatiles 8260C						
Halogenated Volatiles 8260C						
EDB EPA 8011 (Waters Only)						
Semivolatiles 8270D/SIM (with low-level PAHs)						
PAHs 8270D/SIM (low-level)						
PCBs 8082A						
Organochlorine Pesticides 8081B						
Organophosphorus Pesticides 8270D/SIM						
Chlorinated Acid Herbicides 8151A						
Total RCRA Metals						
Total MTCA Metals						
TCLP Metals						
HEM (oil and grease) 1664A						
% Moisture						



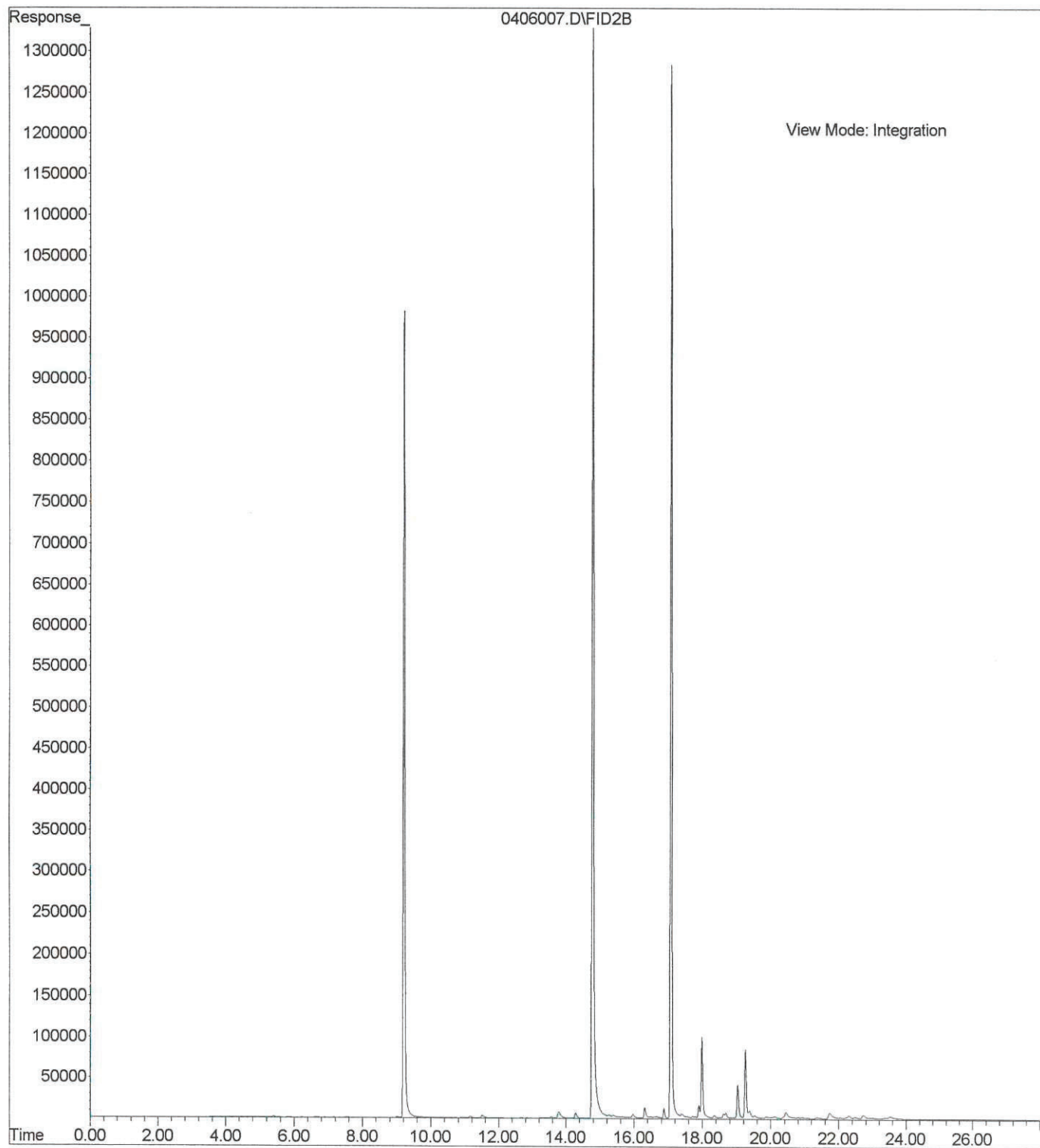
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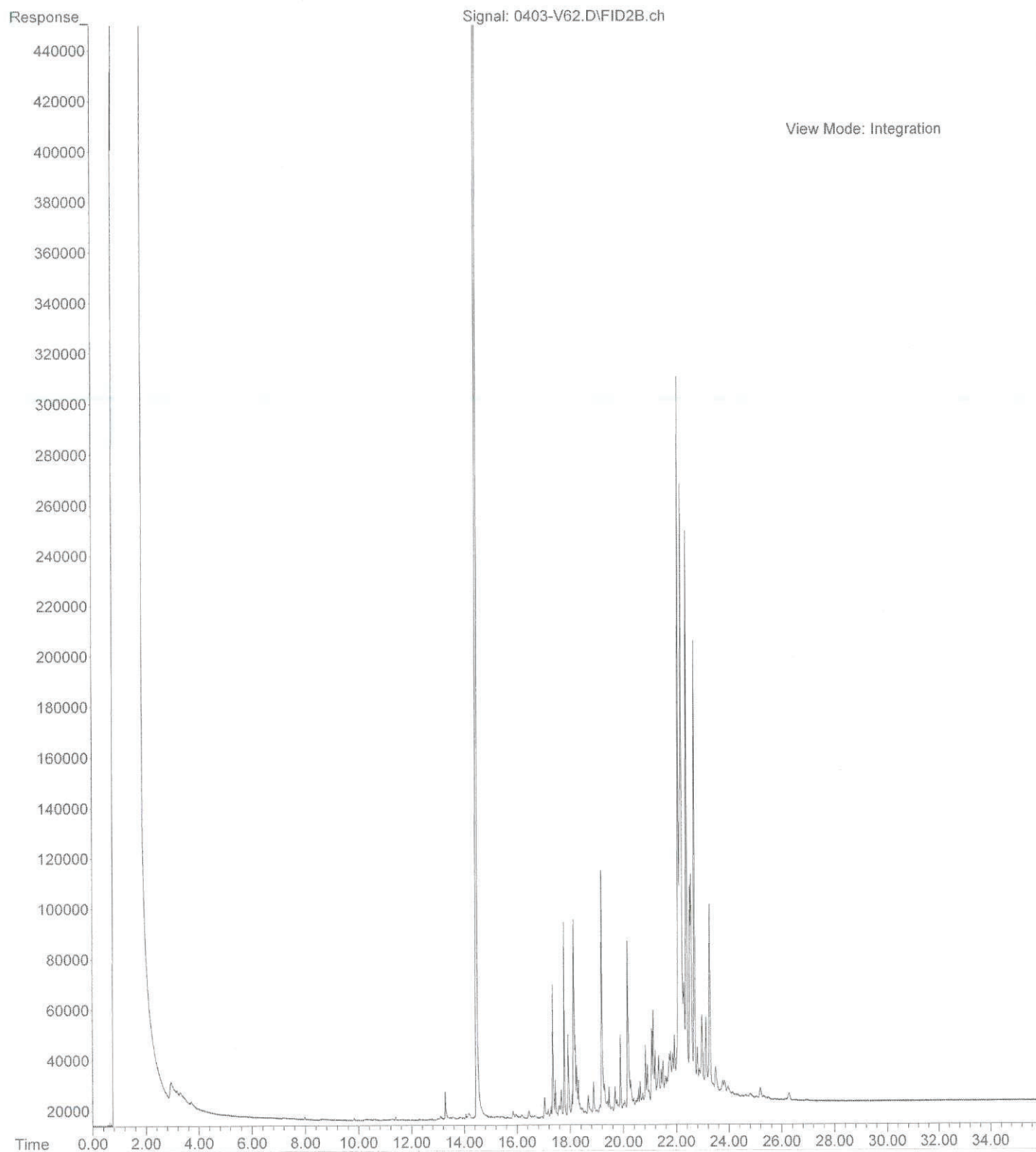
Page 2 of 2

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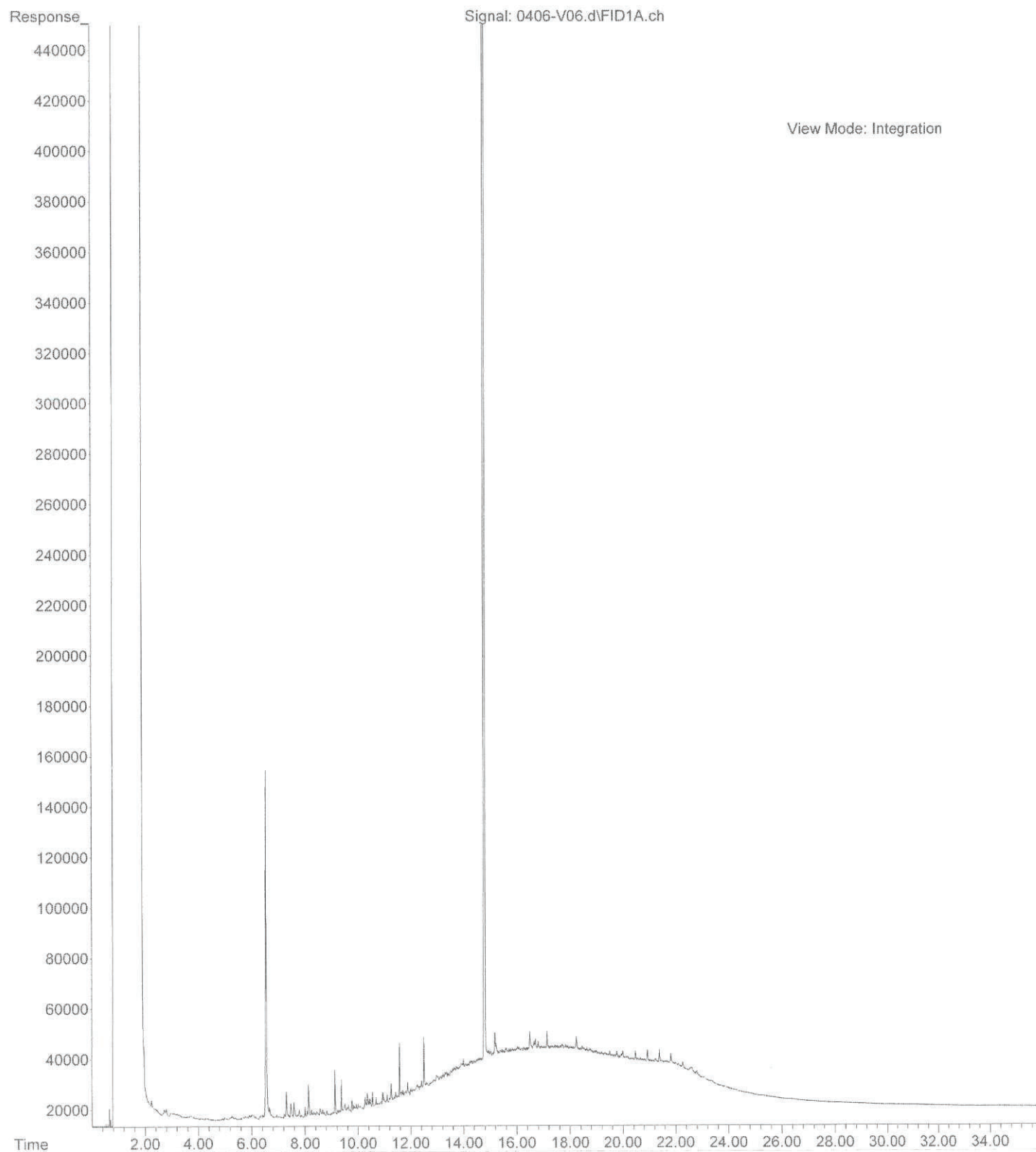
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Operator :
Acquired : 6 Apr 2020 15:21 using AcqMethod 200309G.M
Instrument : Hope
Sample Name: 04-019-04c
Misc Info :
Vial Number: 7



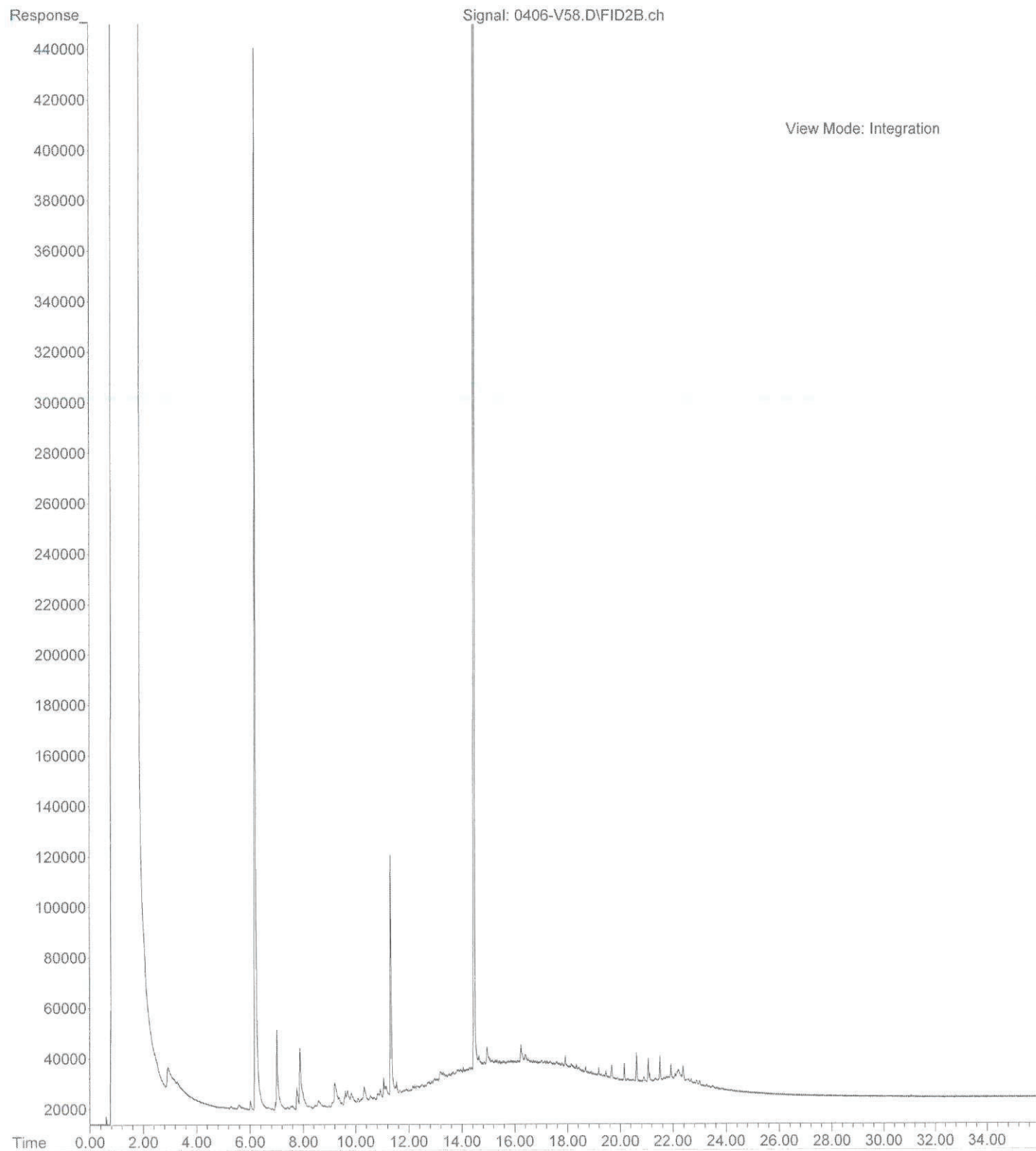
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Instrument : Vigo
Sample Name: 04-019-01
Misc Info :
Vial Number: 62



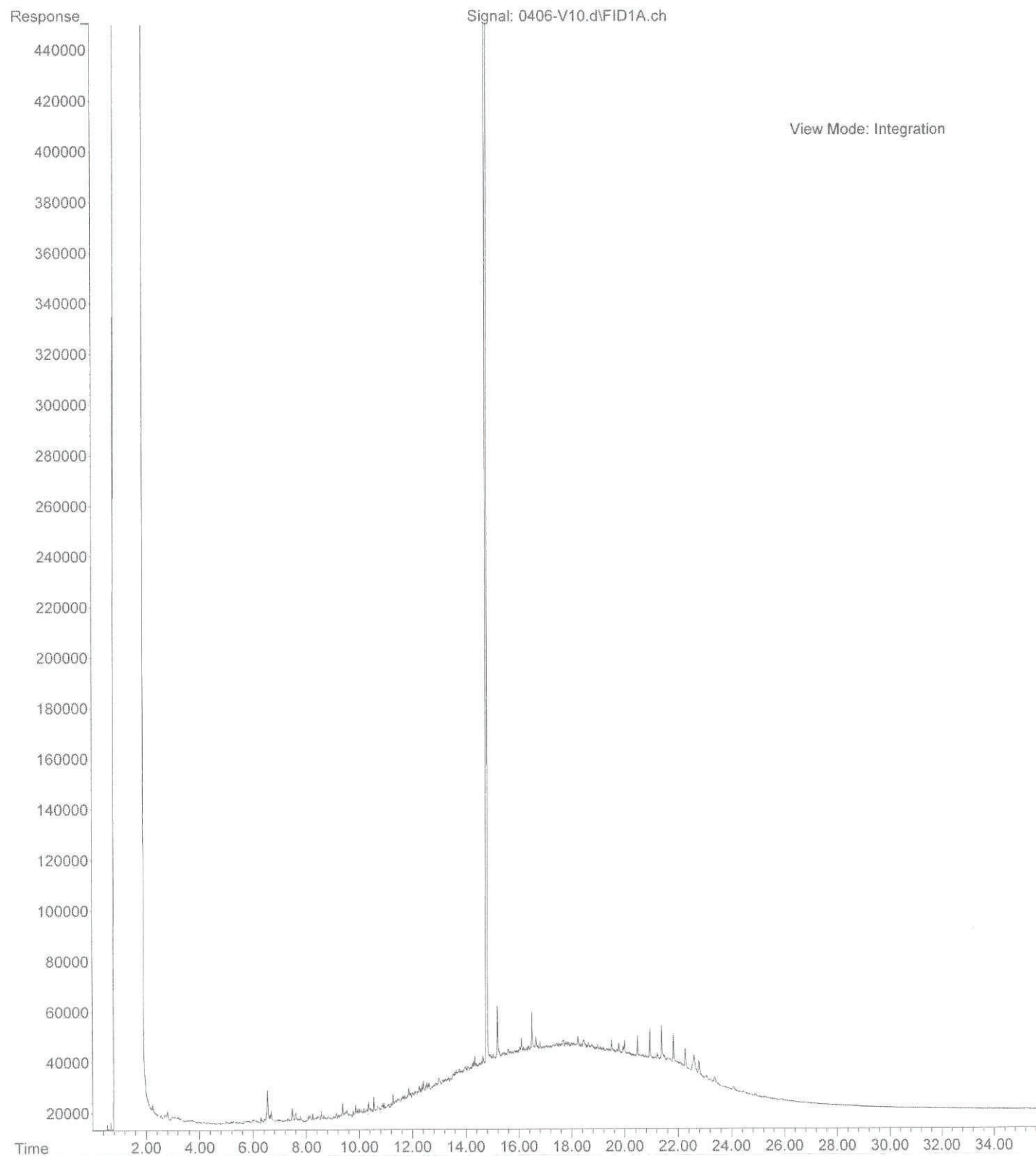
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Operator : JT
Acquired : 6 Apr 2020 11:22 using AcqMethod V191206F.M
Instrument : Vigo
Sample Name: 04-019-02 ~~DUP~~
Misc Info :
Vial Number: 6



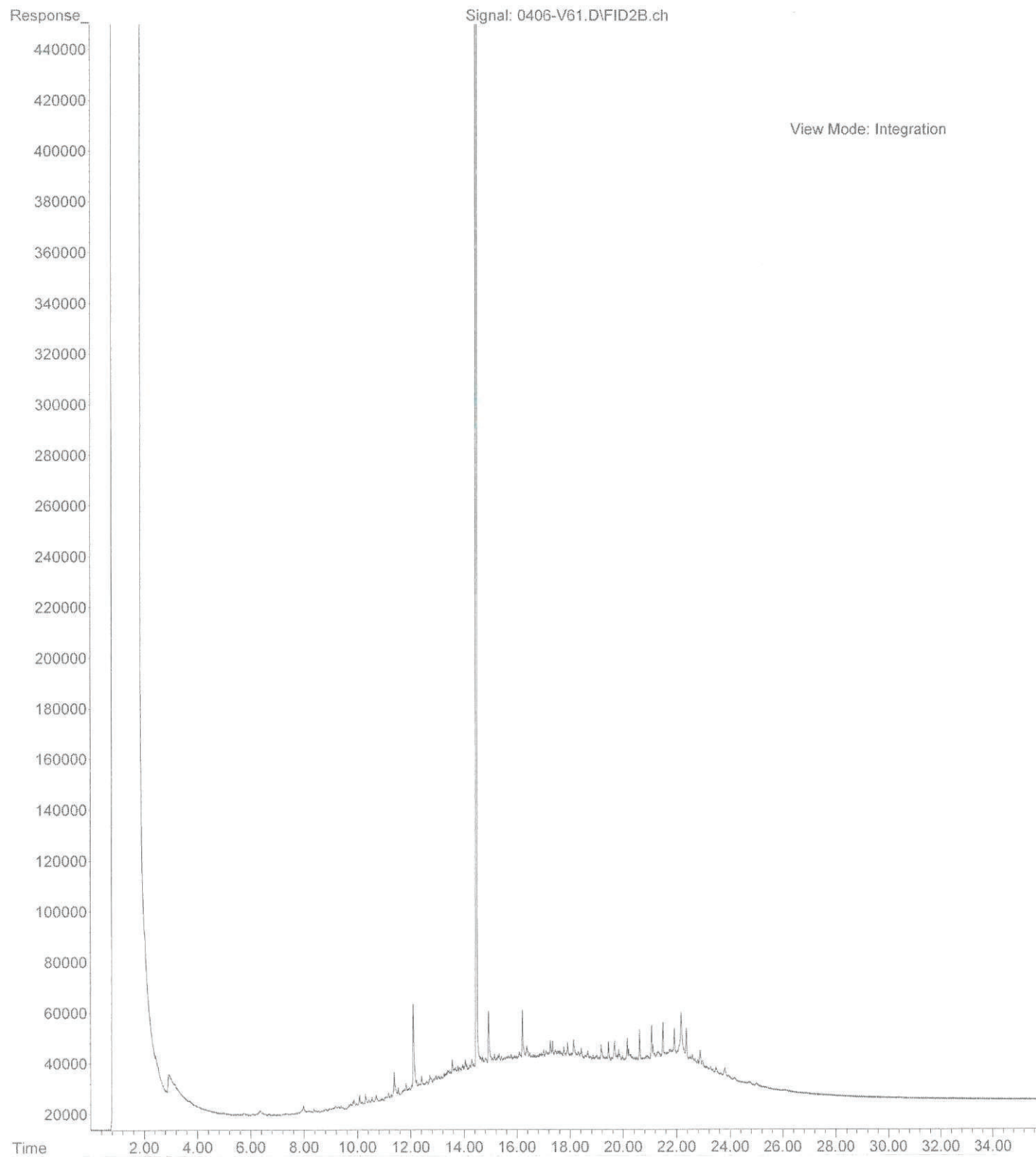
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Operator : JT
Acquired : 6 Apr 2020 12:43 using AcqMethod V191206F.M
Instrument : Vigo
Sample Name: 04-019-04
Misc Info :
Vial Number: 58



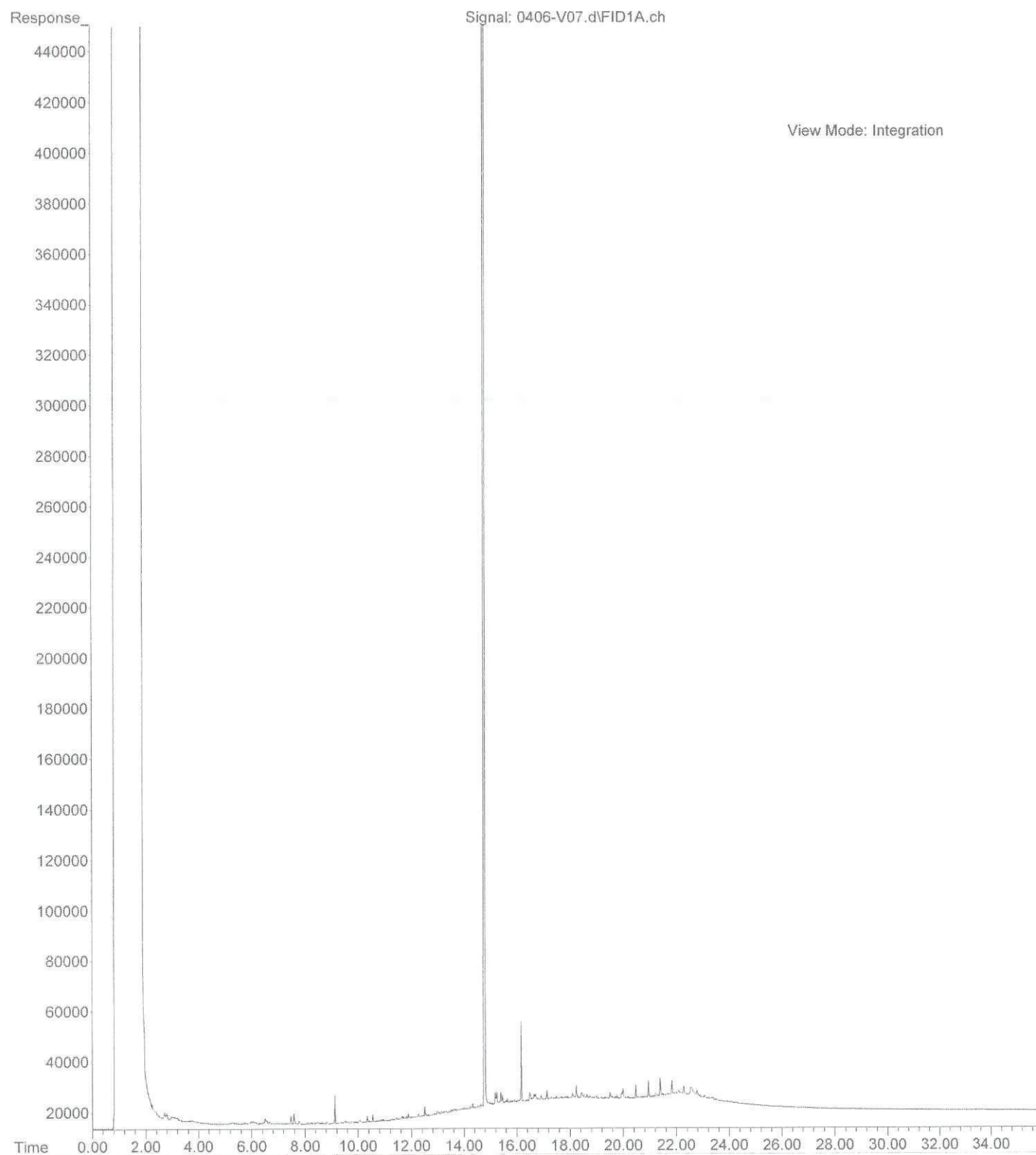
File :X:\DIESELS\VIGO\DATA\V200406\0406-V10.d
Operator : JT
Acquired : 6 Apr 2020 14:04 using AcqMethod V191206F.M
Instrument : Vigo
Sample Name: 04-019-06
Misc Info :
Vial Number: 10



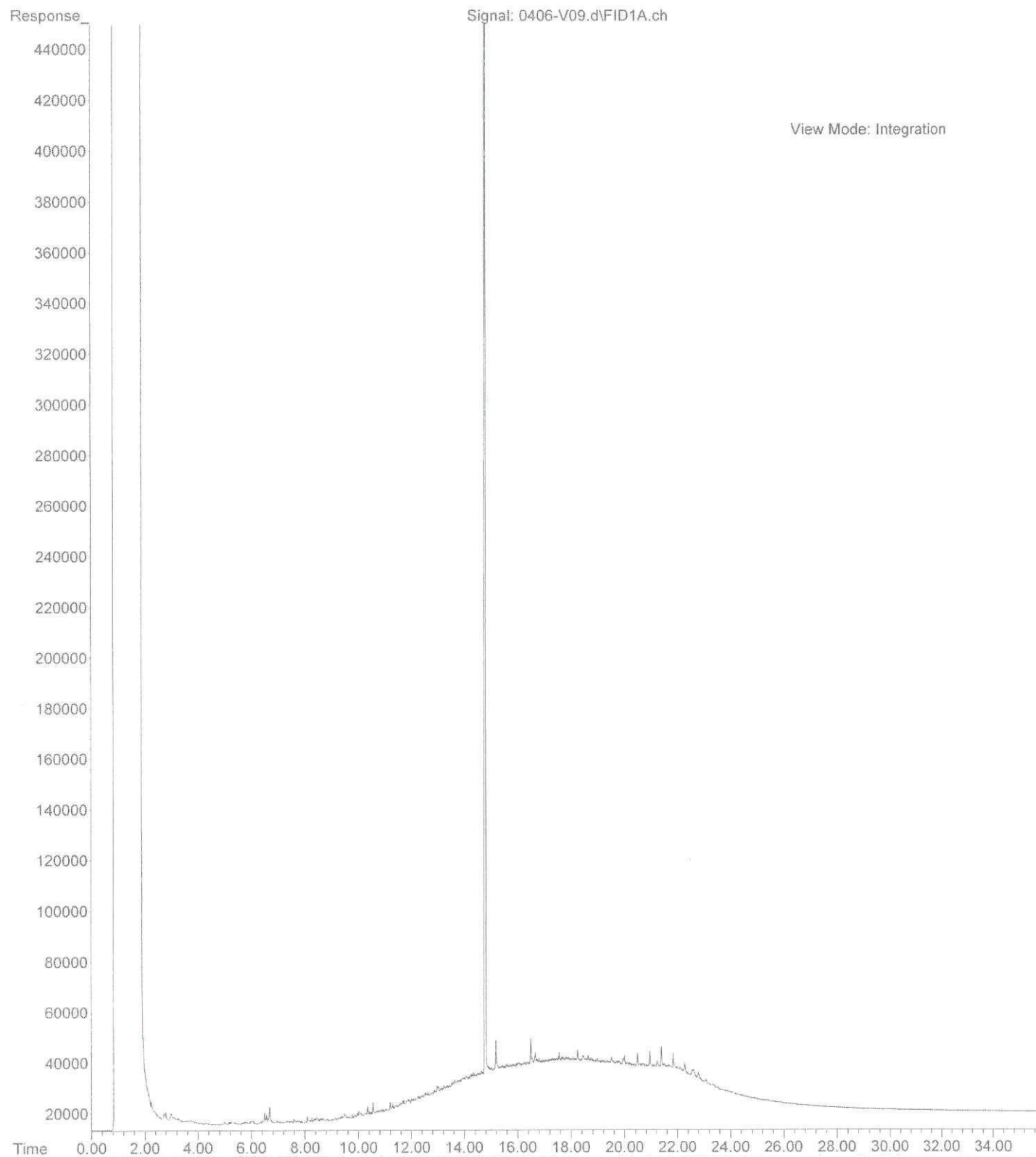
File :X:\DIESELS\VIGO\DATA\V200406.SEC\0406-V61.D
Operator : JT
Acquired : 6 Apr 2020 14:45 using AcqMethod V191206F.M
Instrument : Vigo
Sample Name: 04-019-08
Misc Info :
Vial Number: 61



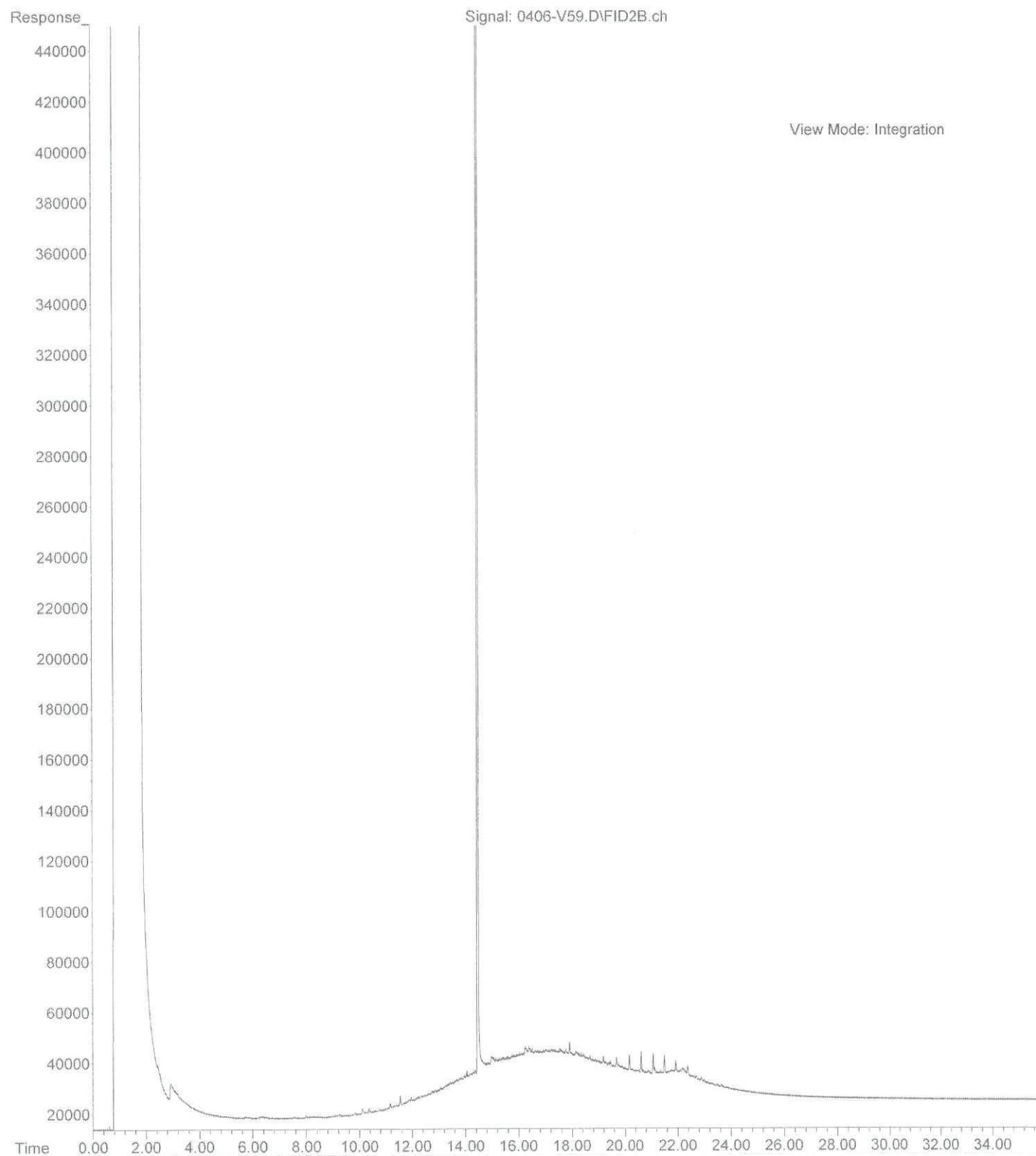
File :X:\DIESELS\VIGO\DATA\V200406\0406-V07.d
Operator : JT
Acquired : 6 Apr 2020 12:02 using AcqMethod V191206F.M
Instrument : Vigo
Sample Name: 04-019-09
Misc Info :
Vial Number: 7



File :X:\DIESELS\VIGO\DATA\V200406\0406-V09.d
Operator : JT
Acquired : 6 Apr 2020 13:24 using AcqMethod V191206F.M
Instrument : Vigo
Sample Name: 04-019-12
Misc Info :
Vial Number: 9



File :X:\DIESELS\VIGO\DATA\V200406.SEC\0406-V59.D
Operator : JT
Acquired : 6 Apr 2020 13:24 using AcqMethod V191206F.M
Instrument : Vigo
Sample Name: 04-019-14
Misc Info :
Vial Number: 59





14648 NE 95th Street, Redmond, WA 98052 • (425) 883-3881

April 15, 2020

Lisa Gilbert
Parametrix
719 2nd Avenue, Suite 200
Seattle, WA 98104

Re: Analytical Data for Project 553-1521-242-01
Laboratory Reference No. 2004-019B

Dear Lisa:

Enclosed are the analytical results and associated quality control data for samples submitted on April 2, 2020.

The standard policy of OnSite Environmental, Inc. is to store your samples for 30 days from the date of receipt. If you require longer storage, please contact the laboratory.

We appreciate the opportunity to be of service to you on this project. If you have any questions concerning the data, or need additional information, please feel free to call me.

Sincerely,

A handwritten signature in black ink, appearing to read "DeB" followed by a stylized flourish.

David Baumeister
Project Manager

Enclosures



OnSite Environmental, Inc. 14648 NE 95th Street, Redmond, WA 98052 (425) 883-3881

This report pertains to the samples analyzed in accordance with the chain of custody, and is intended only for the use of the individual or company to whom it is addressed.

Date of Report: April 15, 2020
Samples Submitted: April 2, 2020
Laboratory Reference: 2004-019B
Project: 553-1521-242-01

Case Narrative

Samples were collected on April 1, 2020 and received by the laboratory on April 2, 2020. They were maintained at the laboratory at a temperature of 2°C to 6°C.

Please note that any and all soil sample results are reported on a dry-weight basis, unless otherwise noted below.

General QA/QC issues associated with the analytical data enclosed in this laboratory report will be indicated with a reference to a comment or explanation on the Data Qualifier page. More complex and involved QA/QC issues will be discussed in detail below.



Date of Report: April 15, 2020
 Samples Submitted: April 2, 2020
 Laboratory Reference: 2004-019B
 Project: 553-1521-242-01

**DIESEL AND HEAVY OIL RANGE ORGANICS
 NWTPH-Dx**

Matrix: Water
 Units: mg/L (ppm)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	20B1-W					
Laboratory ID:	04-019-02					
Diesel Range Organics	ND	0.22	NWTPH-Dx	4-3-20	4-14-20	X1
Lube Oil Range Organics	ND	0.22	NWTPH-Dx	4-3-20	4-14-20	X1
<i>Surrogate:</i>	<i>Percent Recovery</i>	<i>Control Limits</i>				
<i>o-Terphenyl</i>	98	50-150				

Client ID:	20B2-W					
Laboratory ID:	04-019-04					
Diesel Range Organics	ND	0.23	NWTPH-Dx	4-3-20	4-14-20	X1
Lube Oil Range Organics	ND	0.23	NWTPH-Dx	4-3-20	4-14-20	X1
<i>Surrogate:</i>	<i>Percent Recovery</i>	<i>Control Limits</i>				
<i>o-Terphenyl</i>	99	50-150				

Client ID:	20B3-W					
Laboratory ID:	04-019-06					
Diesel Range Organics	ND	0.23	NWTPH-Dx	4-3-20	4-14-20	X1
Lube Oil Range Organics	ND	0.23	NWTPH-Dx	4-3-20	4-14-20	X1
<i>Surrogate:</i>	<i>Percent Recovery</i>	<i>Control Limits</i>				
<i>o-Terphenyl</i>	100	50-150				

Client ID:	20B4-W					
Laboratory ID:	04-019-08					
Diesel Range Organics	ND	0.25	NWTPH-Dx	4-3-20	4-14-20	X1
Lube Oil Range Organics	ND	0.25	NWTPH-Dx	4-3-20	4-14-20	X1
<i>Surrogate:</i>	<i>Percent Recovery</i>	<i>Control Limits</i>				
<i>o-Terphenyl</i>	105	50-150				

Client ID:	20B5-W					
Laboratory ID:	04-019-09					
Diesel Range Organics	ND	0.24	NWTPH-Dx	4-3-20	4-14-20	X1
Lube Oil Range Organics	ND	0.24	NWTPH-Dx	4-3-20	4-14-20	X1
<i>Surrogate:</i>	<i>Percent Recovery</i>	<i>Control Limits</i>				
<i>o-Terphenyl</i>	110	50-150				

Client ID:	20B7-W					
Laboratory ID:	04-019-12					
Diesel Range Organics	ND	0.22	NWTPH-Dx	4-3-20	4-14-20	X1
Lube Oil Range Organics	ND	0.22	NWTPH-Dx	4-3-20	4-14-20	X1
<i>Surrogate:</i>	<i>Percent Recovery</i>	<i>Control Limits</i>				
<i>o-Terphenyl</i>	102	50-150				



Date of Report: April 15, 2020
 Samples Submitted: April 2, 2020
 Laboratory Reference: 2004-019B
 Project: 553-1521-242-01

DIESEL AND HEAVY OIL RANGE ORGANICS
NWTPH-Dx

Matrix: Water
 Units: mg/L (ppm)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	20B8-W					
Laboratory ID:	04-019-14					
Diesel Range Organics	ND	0.24	NWTPH-Dx	4-3-20	4-14-20	X1
Lube Oil Range Organics	ND	0.24	NWTPH-Dx	4-3-20	4-14-20	X1
<i>Surrogate:</i>	<i>Percent Recovery</i>	<i>Control Limits</i>				
<i>o-Terphenyl</i>	99	50-150				



Date of Report: April 15, 2020
 Samples Submitted: April 2, 2020
 Laboratory Reference: 2004-019B
 Project: 553-1521-242-01

**DIESEL AND HEAVY OIL RANGE ORGANICS
 NWTPH-Dx
 QUALITY CONTROL**

Matrix: Water
 Units: mg/L (ppm)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB0403W1					
Diesel Range Organics	ND	0.20	NWTPH-Dx	4-3-20	4-14-20	X1
Lube Oil Range Organics	ND	0.20	NWTPH-Dx	4-3-20	4-14-20	X1
Surrogate:	Percent Recovery	Control Limits				
o-Terphenyl	107	50-150				

Analyte	Result	Spike Level	Source Result	Percent Recovery	Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE								
Laboratory ID:	04-019-02							
	ORIG	DUP						
Diesel Range	ND	ND	NA	NA	NA	NA	NA	X1
Lube Oil Range	ND	ND	NA	NA	NA	NA	NA	X1
Surrogate:								
o-Terphenyl				98	95	50-150		





Data Qualifiers and Abbreviations

- A - Due to a high sample concentration, the amount spiked is insufficient for meaningful MS/MSD recovery data.
 - B - The analyte indicated was also found in the blank sample.
 - C - The duplicate RPD is outside control limits due to high result variability when analyte concentrations are within five times the quantitation limit.
 - E - The value reported exceeds the quantitation range and is an estimate.
 - F - Surrogate recovery data is not available due to the high concentration of coeluting target compounds.
 - H - The analyte indicated is a common laboratory solvent and may have been introduced during sample preparation, and be impacting the sample result.
 - I - Compound recovery is outside of the control limits.
 - J - The value reported was below the practical quantitation limit. The value is an estimate.
 - K - Sample duplicate RPD is outside control limits due to sample inhomogeneity. The sample was re-extracted and re-analyzed with similar results.
 - L - The RPD is outside of the control limits.
 - M - Hydrocarbons in the gasoline range are impacting the diesel range result.
 - M1 - Hydrocarbons in the gasoline range (toluene-naphthalene) are present in the sample.
 - N - Hydrocarbons in the lube oil range are impacting the diesel range result.
 - N1 - Hydrocarbons in diesel range are impacting lube oil range results.
 - O - Hydrocarbons indicative of heavier fuels are present in the sample and are impacting the gasoline result.
 - P - The RPD of the detected concentrations between the two columns is greater than 40.
 - Q - Surrogate recovery is outside of the control limits.
 - S - Surrogate recovery data is not available due to the necessary dilution of the sample.
 - T - The sample chromatogram is not similar to a typical _____.
 - U - The analyte was analyzed for, but was not detected above the reported sample quantitation limit.
 - U1 - The practical quantitation limit is elevated due to interferences present in the sample.
 - V - Matrix Spike/Matrix Spike Duplicate recoveries are outside control limits due to matrix effects.
 - W - Matrix Spike/Matrix Spike Duplicate RPD are outside control limits due to matrix effects.
 - X - Sample extract treated with a mercury cleanup procedure.
 - X1 - Sample extract treated with a sulfuric acid/silica gel cleanup procedure.
 - Y - The calibration verification for this analyte exceeded the 20% drift specified in methods 8260 & 8270, and therefore the reported result should be considered an estimate. The overall performance of the calibration verification standard met the acceptance criteria of the method.
 - Z - The gasoline result is mainly attributed to a single, unidentified peak.
- ND - Not Detected at PQL
 PQL - Practical Quantitation Limit
 RPD - Relative Percent Difference





**M/onsite
Environmental Inc.**

Analytical Laboratory Testing Services
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Phone: (425) 883-3881 • www.onsite-env.com

Chain of Custody

Page 1 of 2

Turnaround Request (in working days)				Laboratory Number: 04-019																					
(Check One)																									
☐ Same Day ☐ 1 Day																									
☐ 2 Days ☐ 3 Days																									
☒ Standard (7 Days)																									
☐ _____ (other)																									
Company:	Parametrix																								
Project Number:	553-1521-242-01																								
Project Name:	KC Metro - Tukula Bldg C																								
Project Manager:	Lisa Gilbert																								
Sampled by:	Mike Brady																								
Lab ID	Sample Identification	Date Sampled	Time Sampled	Matrix	Number of Containers																				
1	20B1-5	4/1	8:50	S	1	NWTPH-HCID	NWTPH-Gx/BTEX	NWTPH-Gx	NWTPH-Dx (☐ Acid / SG Clean-up)	Volatiles 8260C	Halogenated Volatiles 8260C	EDB EPA 8011 (Waters Only)	Semivolatiles 8270D/SIM (with low-level PAHs)	PAHs 8270D/SIM (low-level)	PCBs 8082A	Organochlorine Pesticides 8081B	Organophosphorus Pesticides 8270D/SIM	Chlorinated Acid Herbicides 8151A	Total RCRA Metals	Total MTCA Metals	TCLP Metals	HEM (oil and grease) 1664A	Acu/SG	% Moisture	
2	20B1-W		9:30	W	5		X		X																X
3	20B2-3.5		9:50	S	1				X																X
4	20B2-W		10:10	W	5		X		X																X
5	20B3-4.5		10:35	S	1				X																X
6	20B3-W		10:50	W	5		X		X																X
7	20B4-4.5		11:15	S	1				X																X
8	20B4-W		11:30	W	5		X		X																X
9	20B5-W		13:55	W	5		X		X																X
10	20B6-7		14:10	S	1																				X
Signature		Company		Date	Time	Comments/Special Instructions																			
Relinquished		Parametrix		4/2/20	13:00	HOLD 20B6-7 X Added 4/13/2020 - J8 (STA)																			
Received		OSI		4/2/20	13:00																				
Relinquished																									
Received																									
Relinquished																									
Received																									
Relinquished																									
Reviewed/Date		Reviewed/Date				Data Package: Standard ☐ Level III ☐ Level IV ☐ Chromatograms with final report ☐ Electronic Data Deliverables (EDDs) ☐																			



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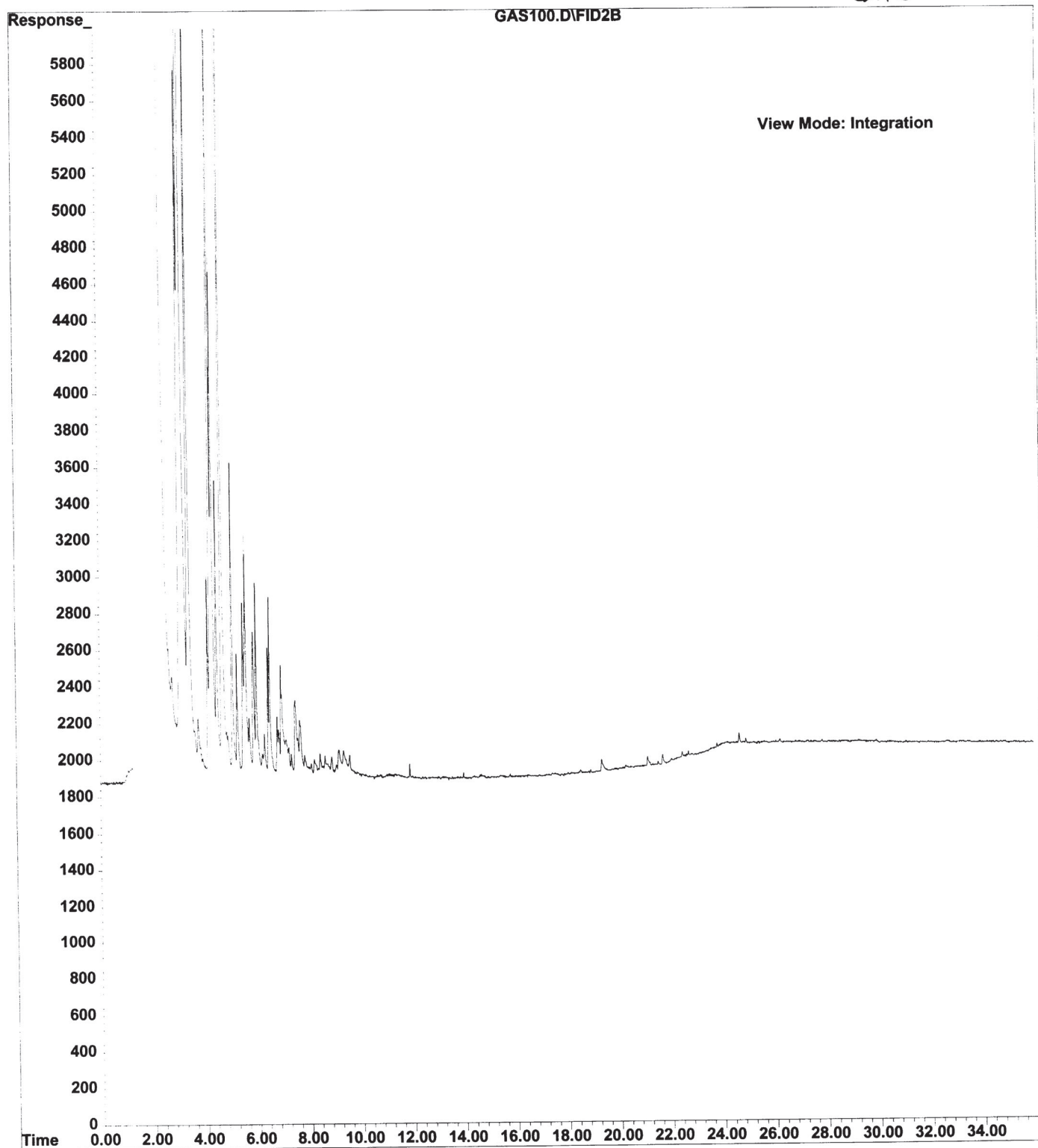
Chain of Custody

Page 2 of 2

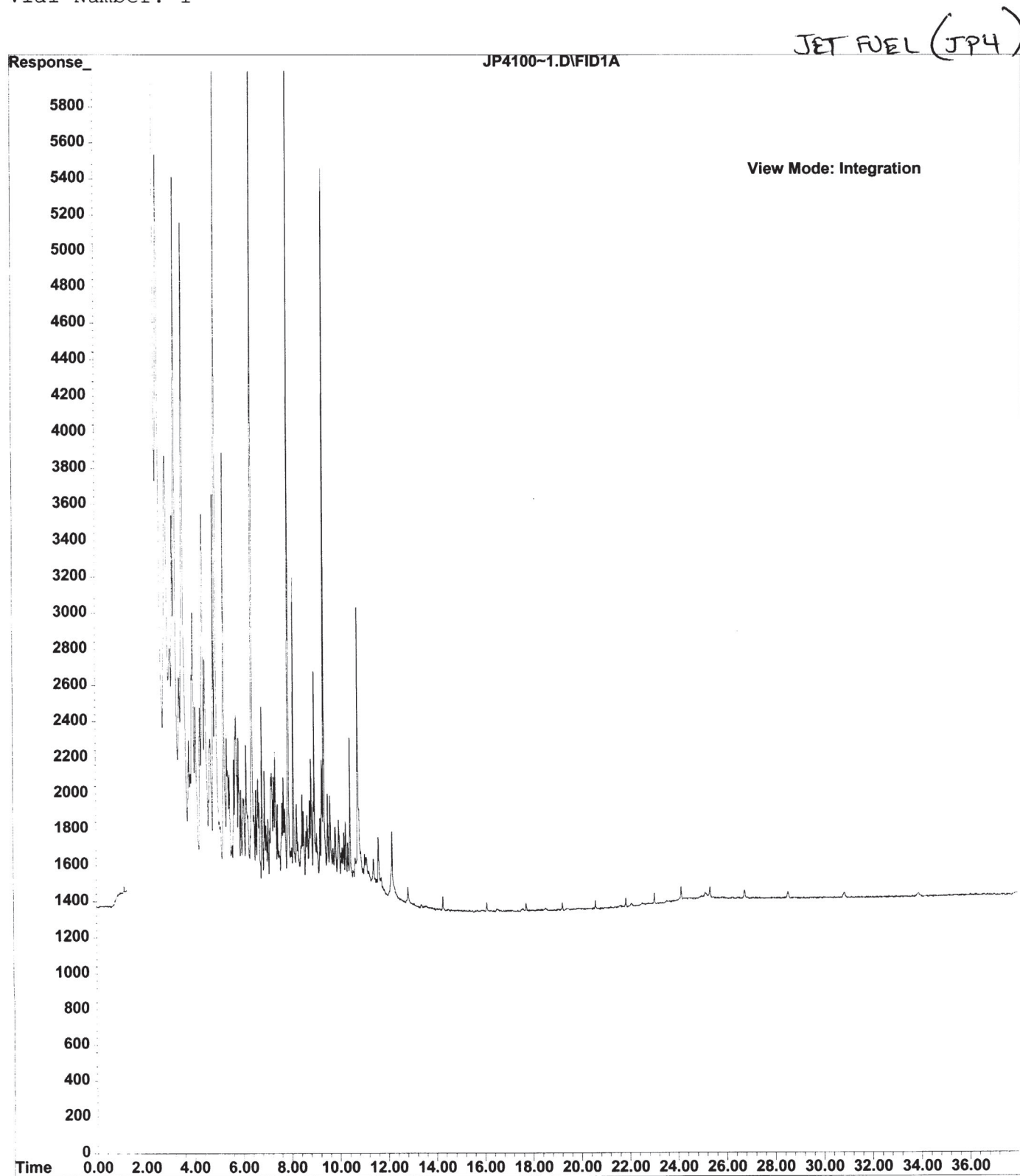
[illegible]

File : E:\1\DATA\LUCYLI~1\GAS100.D
Operator : JAW
Acquired : 4 Apr 1999 1:47 using AcqMethod COLUMN1.M
Instrument : Lucy
Sample Name: GAS 100
Misc Info : 2
Vial Number: 97

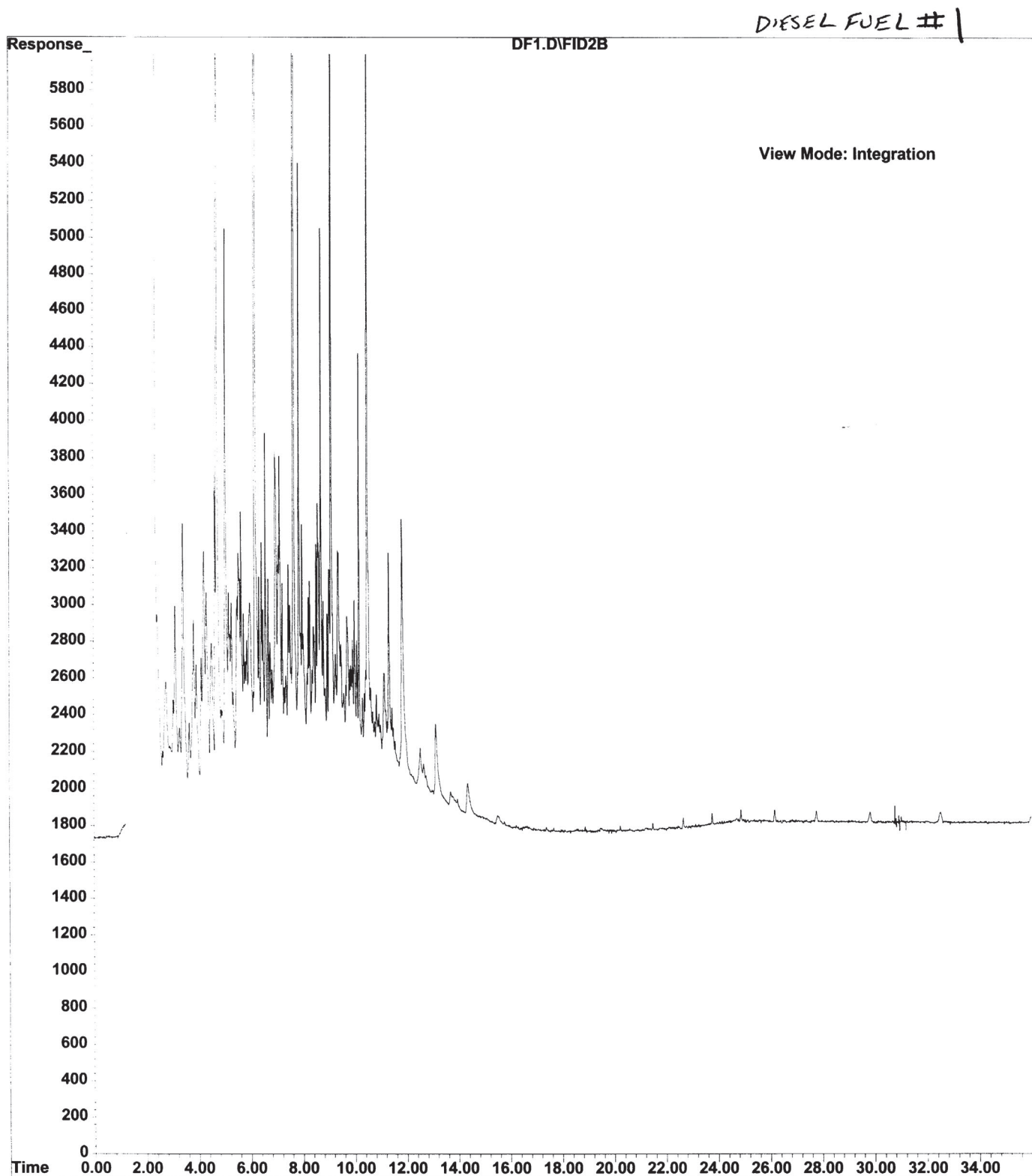
GAS



File : E:\1\DATA\LUCYLI~1\JP4100~1.D
Operator : JAW
Acquired : 4 Feb 20100 8:0 using AcqMethod COLUMN1.M
Instrument : Lucy
Sample Name: JET FUEL (JP4) 100PPM
Misc Info : 1
Vial Number: 1

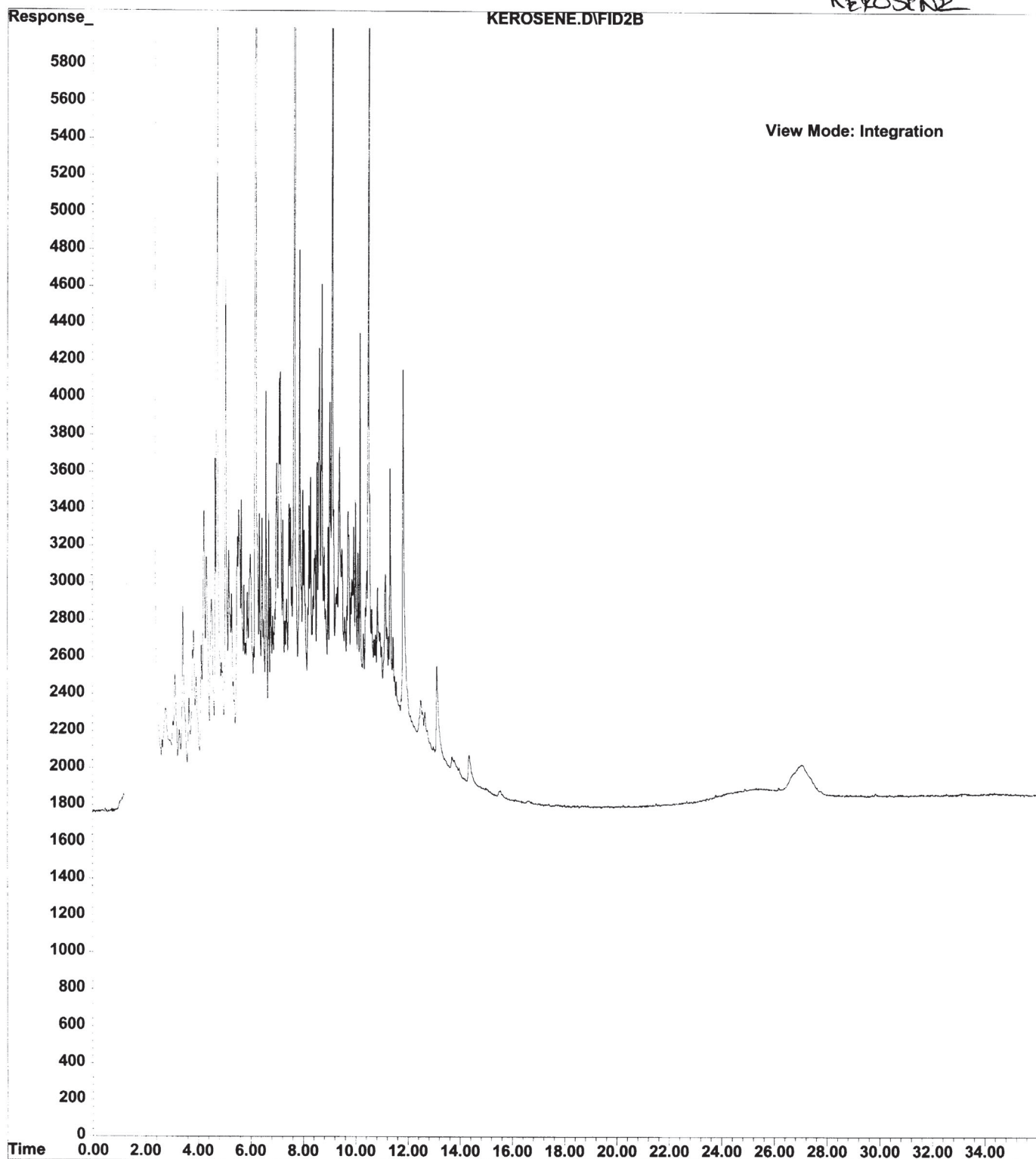


File : E:\1\DATA\LUCYLI~1\DF1.D
Operator : JAW
Acquired : 7 Apr 1999 15:46 using AcqMethod COLUMN1.M
Instrument : Lucy
Sample Name: DF1 100 PPM
Misc Info : 2
Vial Number: 58



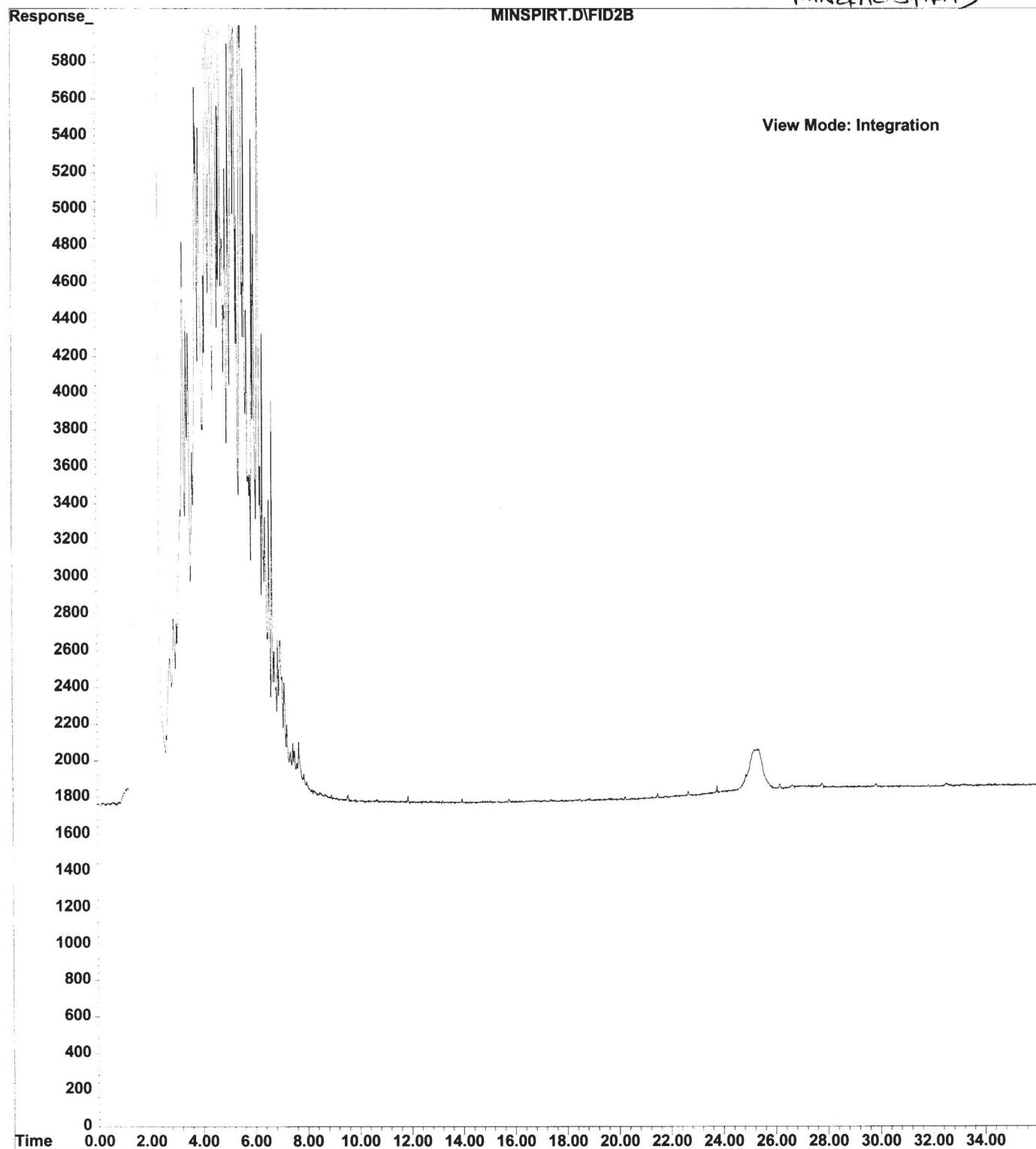
File : E:\1\DATA\LUCYLI~1\KEROSENE.D
Operator : JAW
Acquired : 6 Apr 1999 23:19 using AcqMethod COLUMN1.M
Instrument : Lucy
Sample Name: KEROSENE 100
Misc Info : 2
Vial Number: 68

KEROSENE

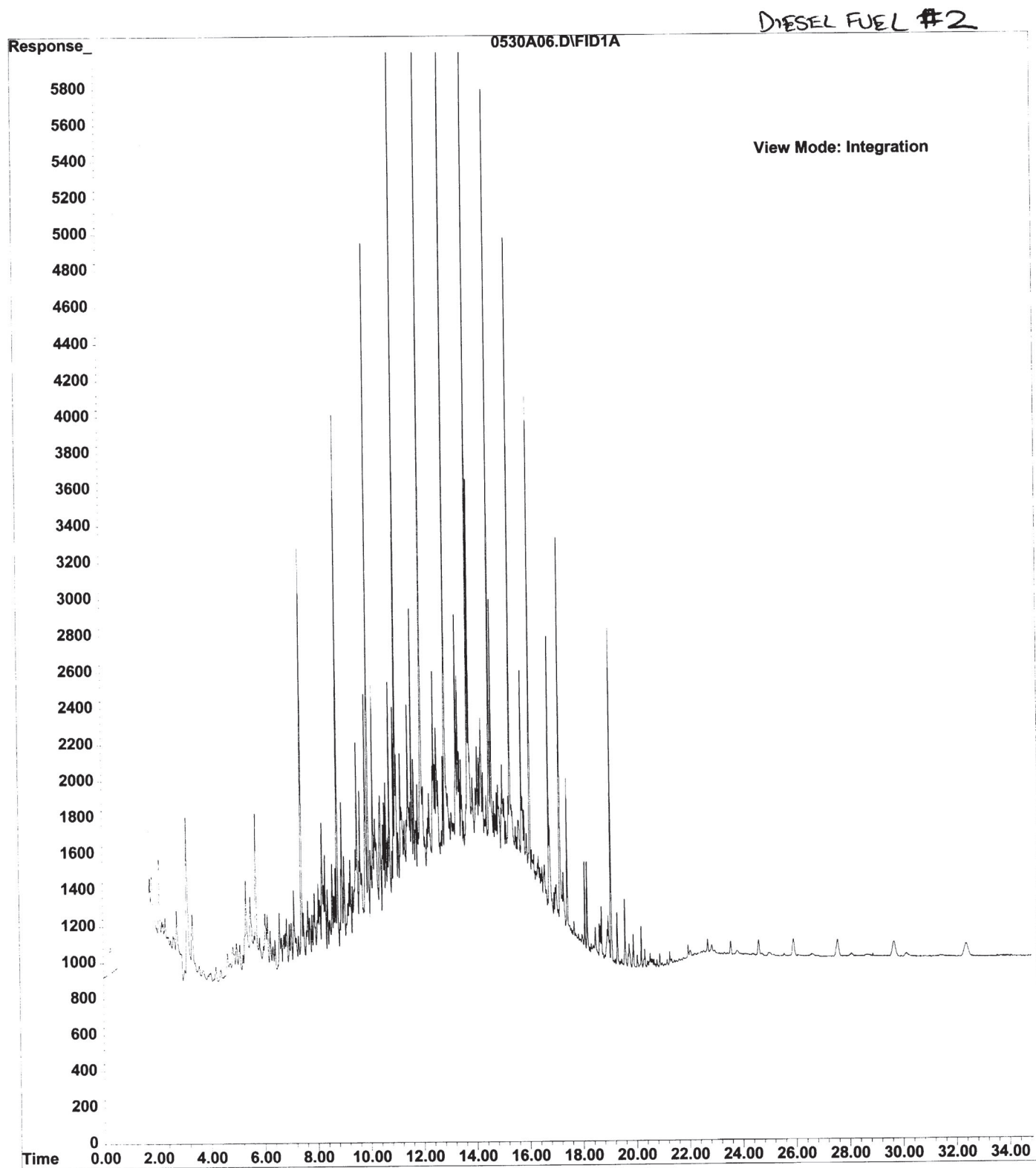


File : E:\1\DATA\LUCYLI~1\MINSPIRT.D
Operator : JAW
Acquired : 6 Apr 1999 22:37 using AcqMethod COLUMN1.M
Instrument : Lucy
Sample Name: MIN SPIR 100 PPM
Misc Info : 2
Vial Number: 67

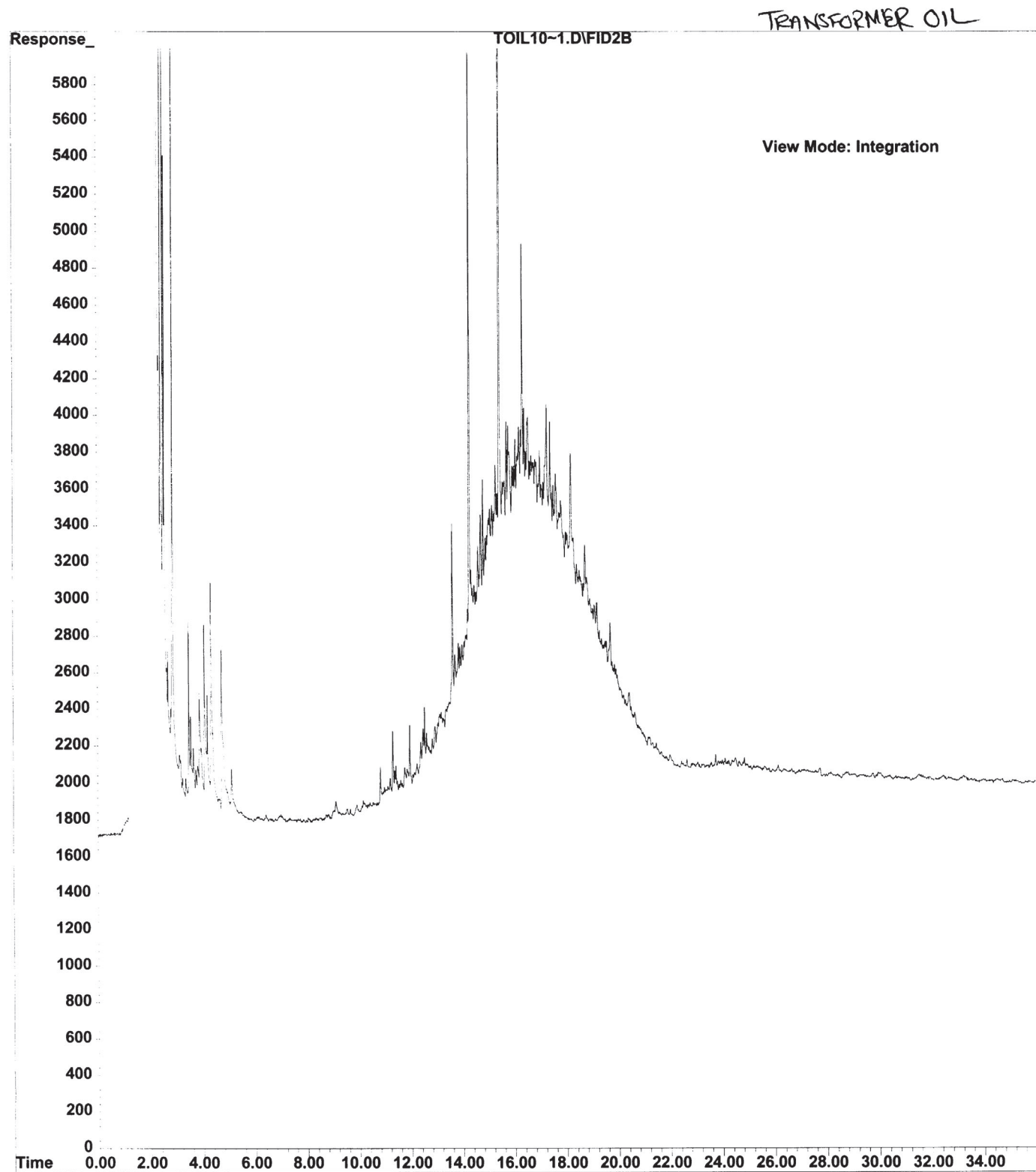
MINERAL SPIRITS



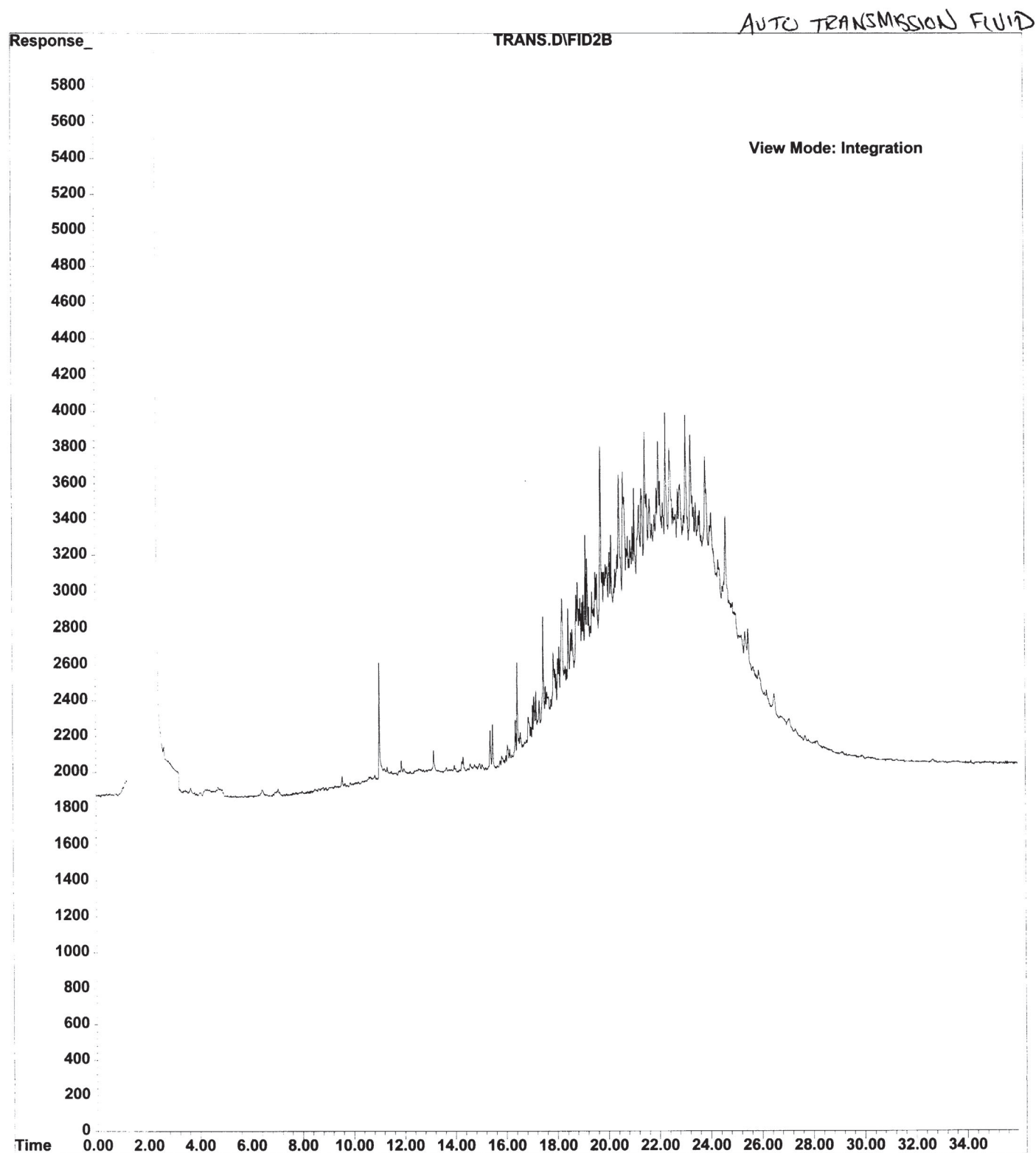
File : E:\1\DATA\L030530\0530A06.D
Operator : TK
Acquired : 30 May 2010 3 125:3 using AcqMethod A1007.M
Instrument : Lucy
Sample Name: CCV0530B-3
Misc Info : 1
Vial Number: 6



File : E:\1\DATA\LUCYLI~1\TOIL10~1.D
Operator : JAW
Acquired : 9 Apr 1999 14:08 using AcqMethod COLUMN1.M
Instrument : Lucy
Sample Name: TOIL 100 ppm
Misc Info : 2
Vial Number: 57

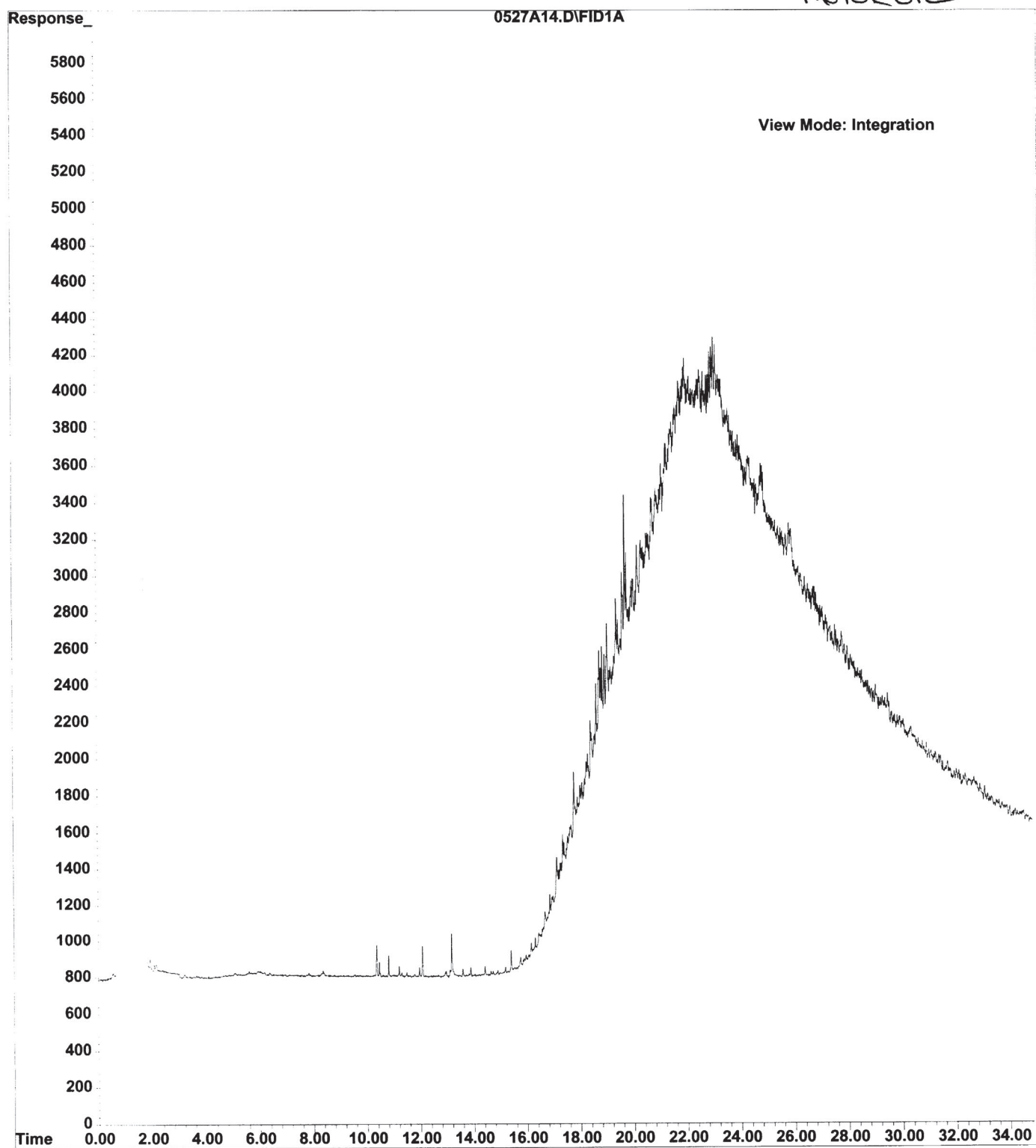


File : E:\1\DATA\LUCYLI~1\TRANS.D
Operator : JAW
Acquired : 4 Apr 1999 3:12 using AcqMethod COLUMN1.M
Instrument : Lucy
Sample Name: AUTO TRAN 100
Misc Info : 2
Vial Number: 99

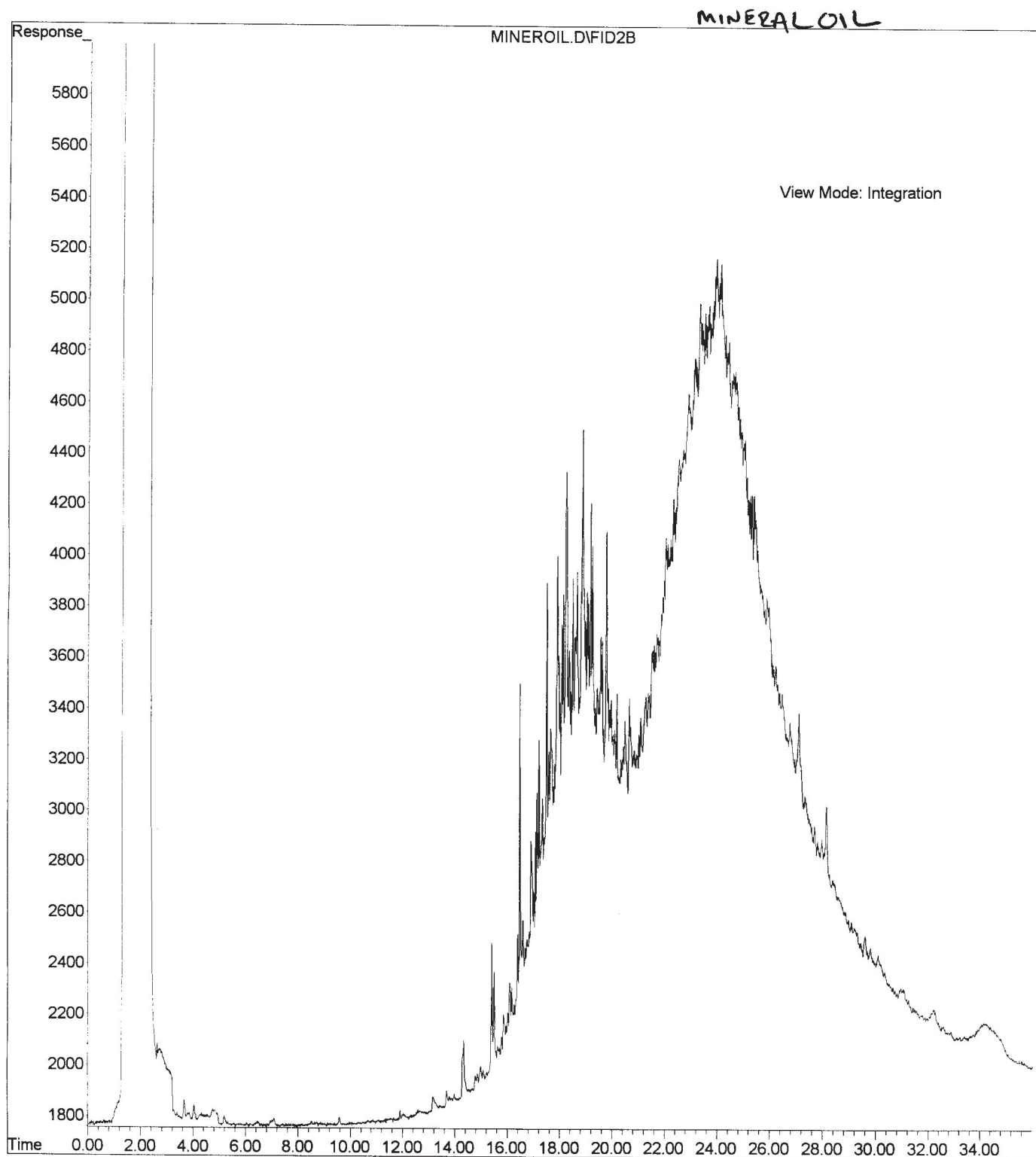


File : E:\1\DATA\L030527\0527A14.D
Operator : TK
Acquired : 28 May 20103 2:0 using AcqMethod A1007.M
Instrument : Lucy
Sample Name: OIL 500 PPM
Misc Info : 1
Vial Number: 14

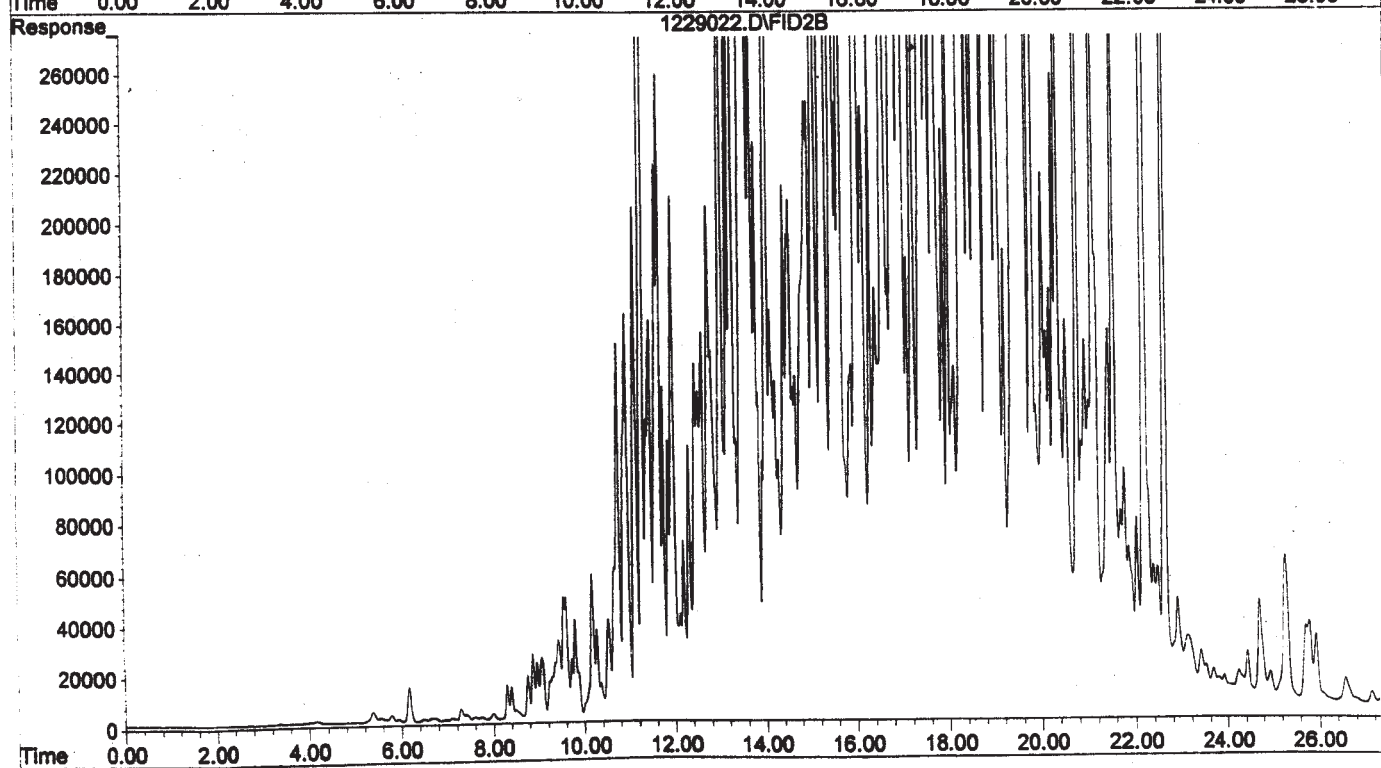
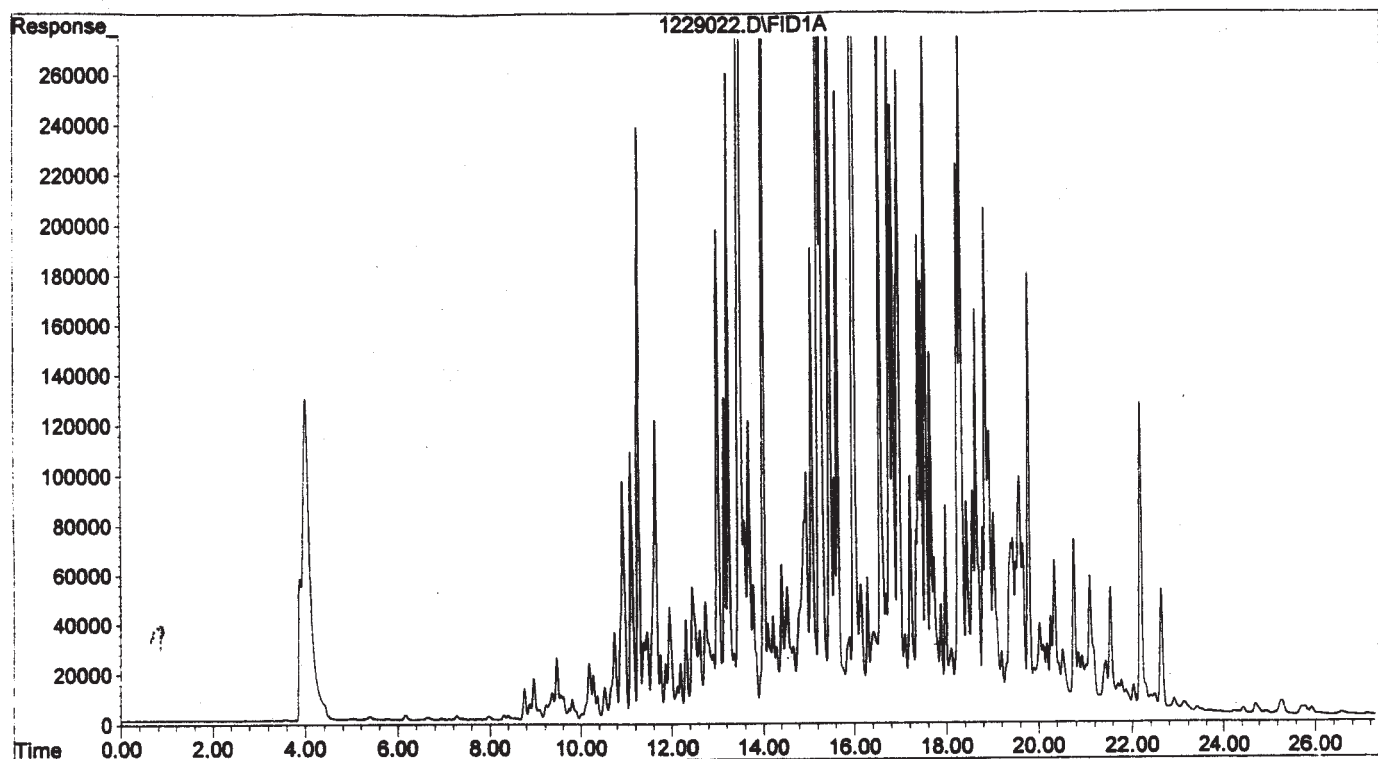
MOTOR OIL



File : D:\HPCHEM\1\DATA\LUCY LIBRARY\MINEROIL.D
Operator : JAW
Acquired : 7 Apr 1999 00:02 using AcqMethod COLUMN1.M
Instrument : Lucy
Sample Name: MIN OIL 100
Misc Info : 2
Vial Number: 69



File : C:\HPCHEM\1\DATA\981229\1229022.D
Operator :
Acquired : 30 Dec 1998 2:16 using AcqMethod 0911BTEX.M
Instrument : GasBtex
Sample Name: 5.0 PPM 75% Weathered Gas Std.
Misc Info :
Vial Number: 26



Quantitation Report

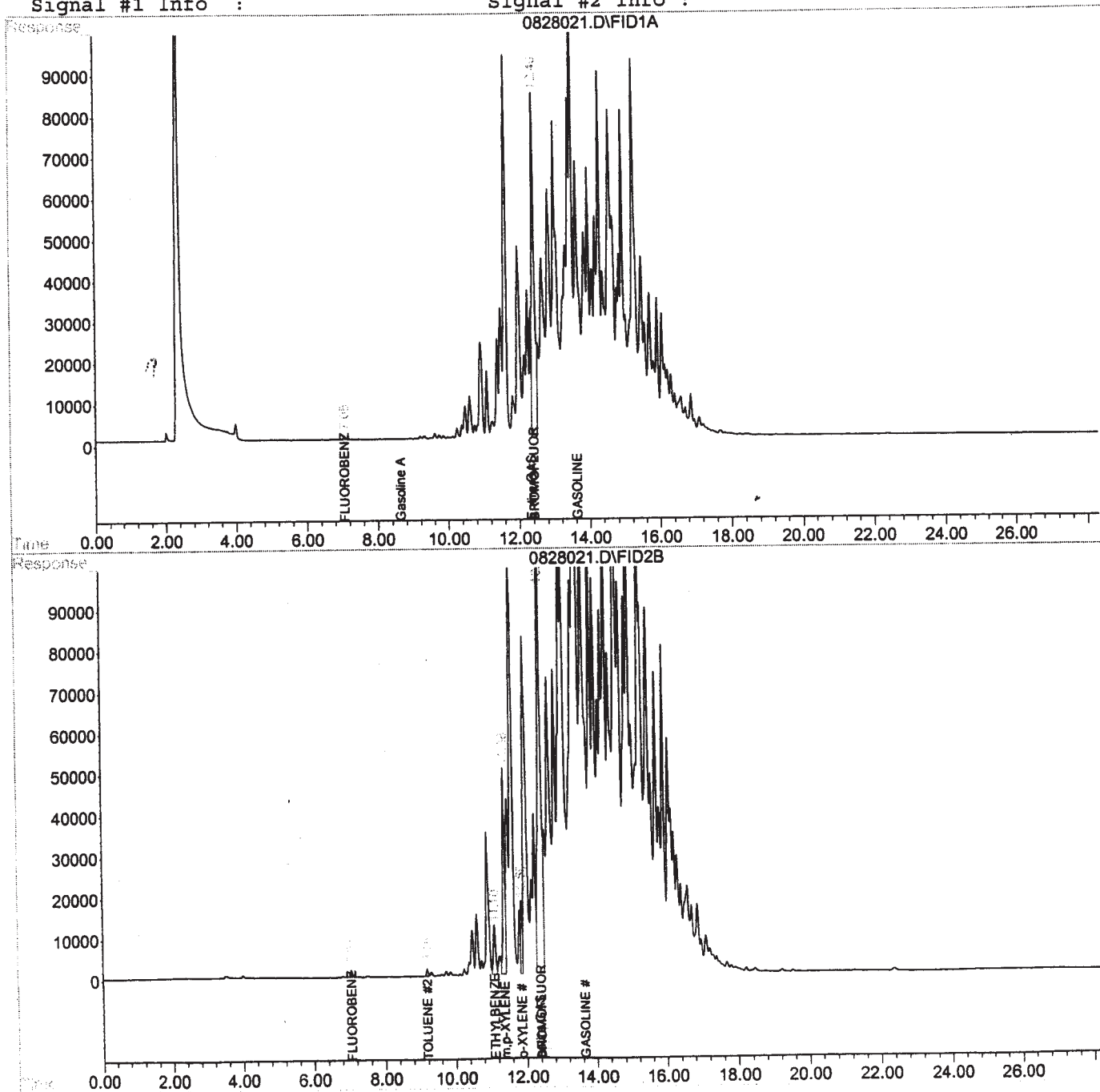
Signal #1 : X:\BTEX\DARYL\D030828\0828021.D\FID1A.CH Vial: 21
 Signal #2 : X:\BTEX\DARYL\D030828\0828021.D\FID2B.CH
 Acq On : 29 Aug 2003 00:41 Operator:
 Sample : 1.0 PPM MINERAL SPIRITS Inst : BTEX
 Misc : Multiplr: 1.00
 Sample Amount: 0.00

IntFile Signal #1: events.e IntFile Signal #2: events2.e

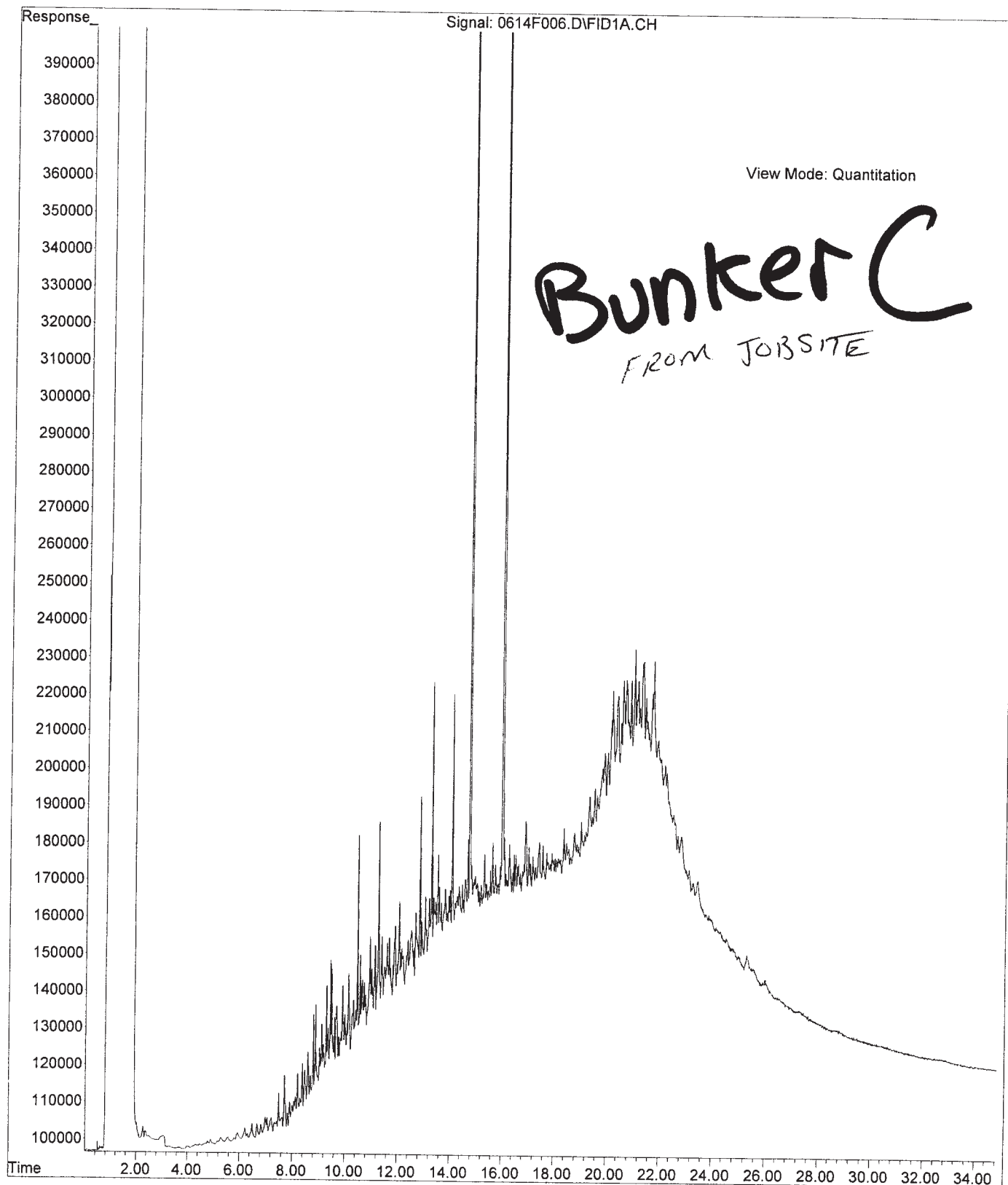
Quant Time: Aug 29 1:09 2003 Quant Results File: 0505BTXB.RES

Quant Method : D:\BTEX\METHODS\0505BTXB.M (Chemstation Integrator)
 Title : Fid calibration
 Last Update : Fri May 30 17:15:21 2003
 Response via : Multiple Level Calibration
 DataAcq Meth : 0505BTXB.M

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

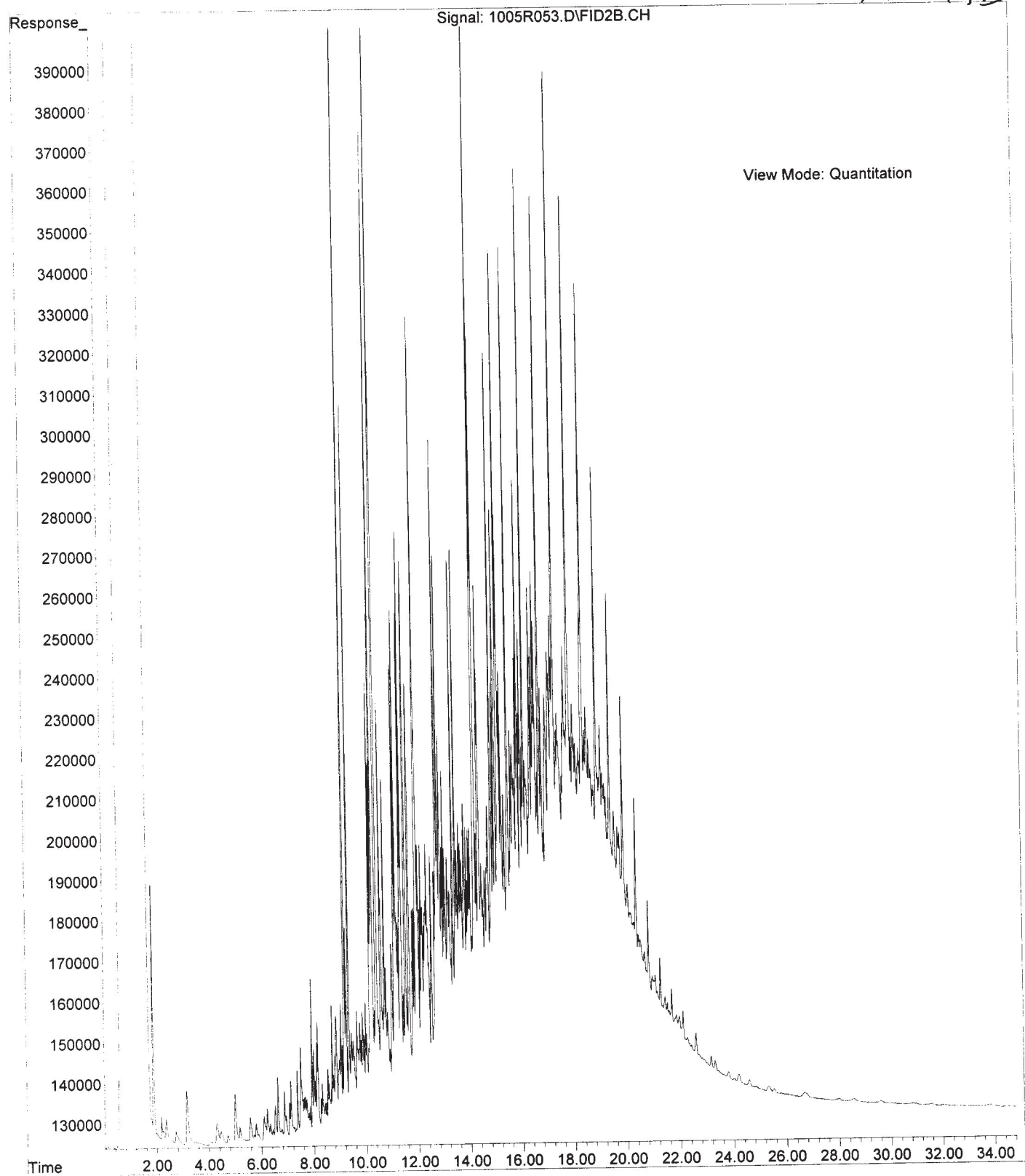


File :X:\DIESELS\TERI\DATA\T050614\0614F006.D
Operator : DY
Acquired : 14 Jun 2005 20:55 using AcqMethod TERI_FRONT.M
Instrument : Teri
Sample Name: 06-077-04b 5x
Misc Info : 1
Vial Number: 6



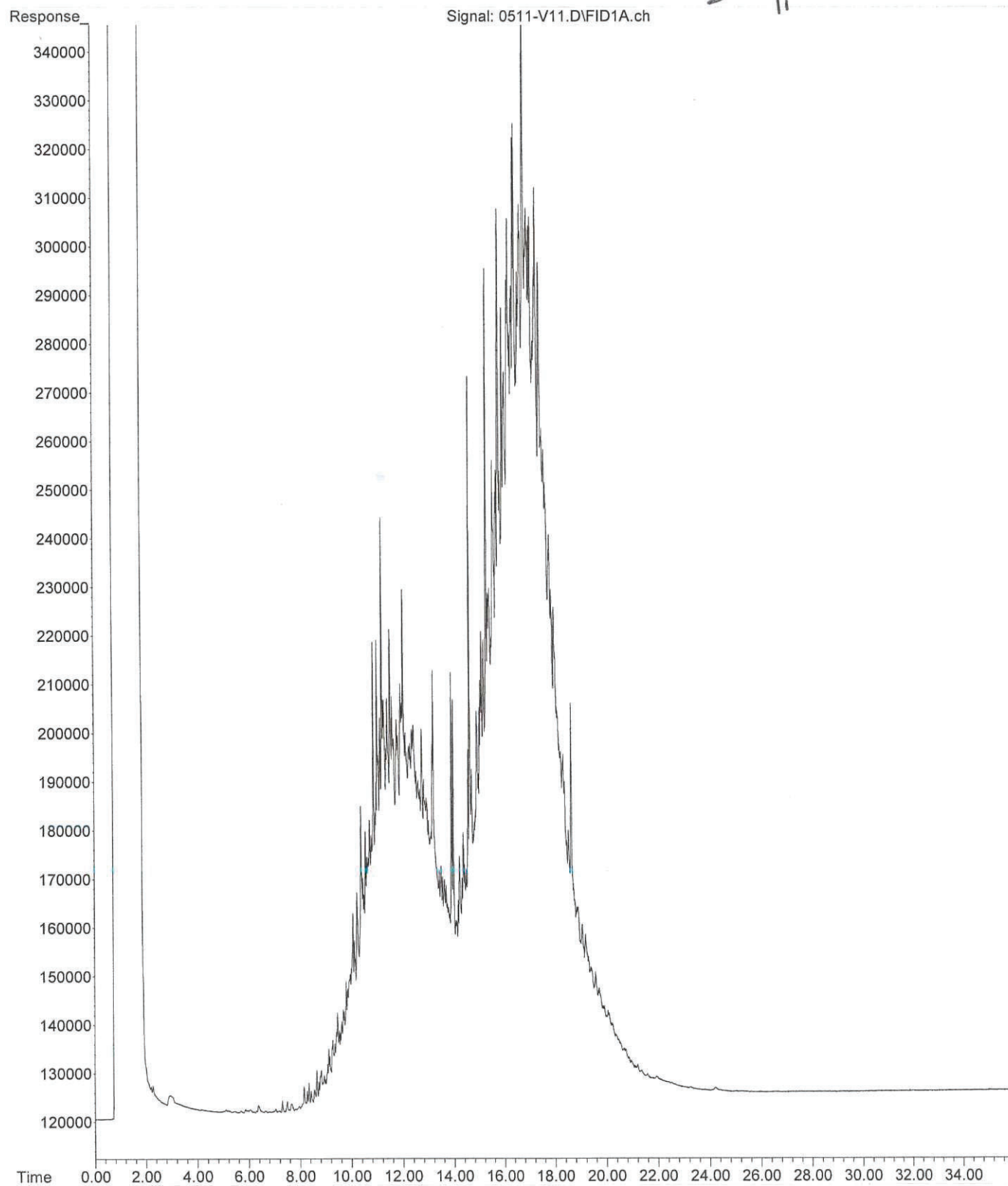
File :X:\DIESELS\TERI\DATA\T051005.SEC\1005R053.D
Operator : DY
Acquired : 05 Oct 2005 18:54 using AcqMethod TERI_FRONT.M
Instrument : Teri
Sample Name: BUNKER C 500 PPM
Misc Info : 2
Vial Number: 53

BUNKER C STANDARD



File : C:\msdchem\2\DATA\V120511\0511-V11.D
Operator :
Acquired : 11 May 2012 18:35 using AcqMethod V120327F.M
Instrument : VIGO
Sample Name: 200 PPM HOIL
Misc Info : SV2-100-04
Vial Number: 11

200ppm Hydraulic Oil



Quantitation Report

Data File : d:\archon\DATA\H060602\0602001.D

Vial: 1

Acq On : 2 Jun 2006 11:47

Operator:

Sample : CCVH0602G-1

Inst : Archon

Misc : V2-10-2

Multiplr: 1.00

Sample Amount: 0.00

IntFile : events.e

Quant Time: Jun 2 12:15 2006 Quant Results File: 060518.RES

Quant Method : D:\ARCHON\METHODS\060518.M (Chemstation Integrator)

Title : Fid calibration

Last Update : Fri May 19 12:26:30 2006

Response via : Multiple Level Calibration

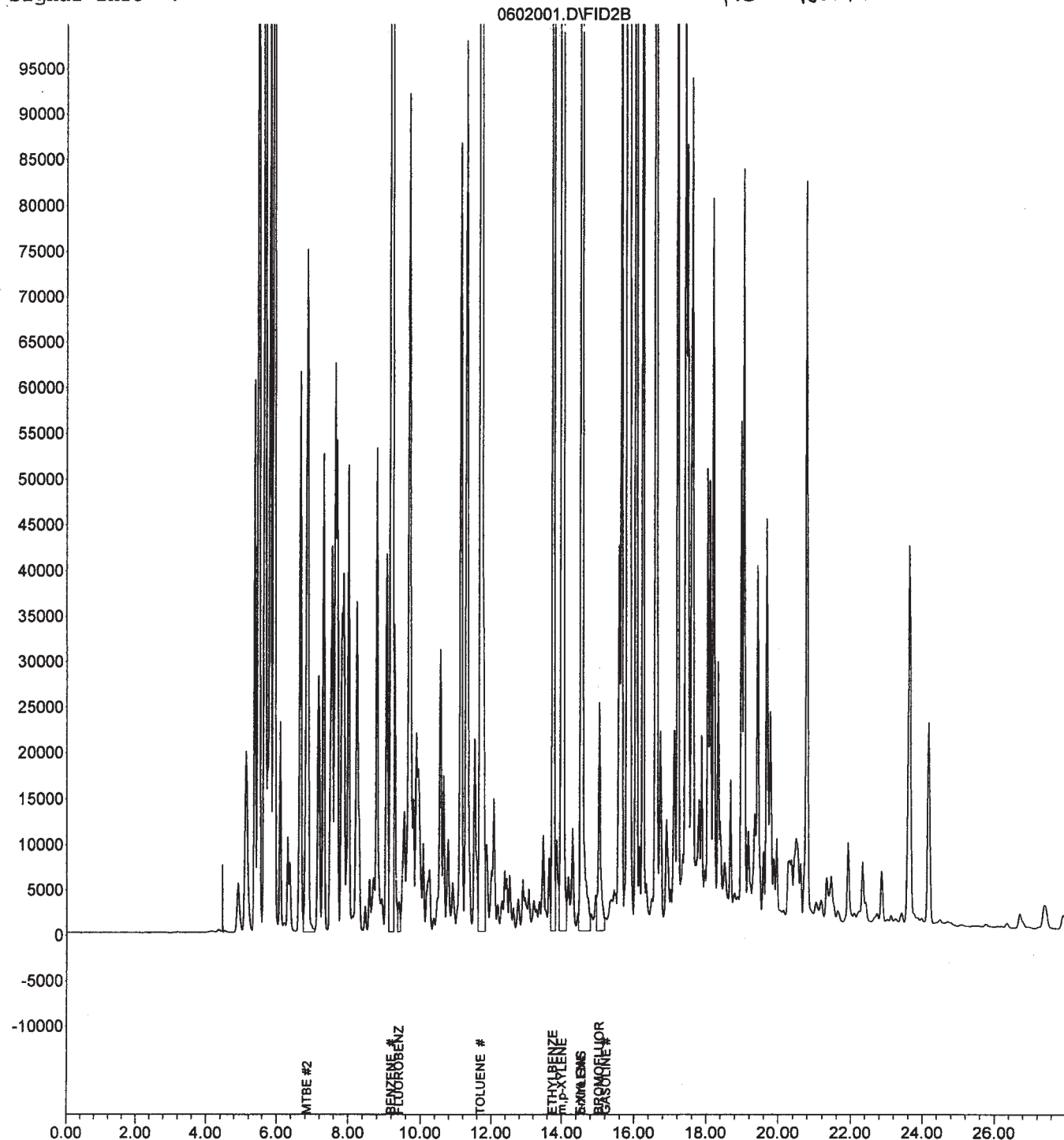
DataAcq Meth : 060518.M

Volume Inj. :

Signal Phase :

Signal Info :

*5.0 PPM Gas Standard
from NWTPH-Gx instrument*



Quantitation Report

Data File : d:\archon\DATA\H060602\0602002.D

Vial: 2

Acq On : 2 Jun 2006 12:26

Operator:

Sample : CCVH0602B-1

Inst : Archon

Misc : V2-9-10 / V2-9-9

Multiplr: 1.00

Sample Amount: 0.00

IntFile : events.e

Quant Time: Jun 2 12:54 2006 Quant Results File: 060518.RES

Quant Method : D:\ARCHON\METHODS\060518.M (Chemstation Integrator)

Title : Fid calibration

Last Update : Fri May 19 12:26:30 2006

Response via : Multiple Level Calibration

DataAcq Meth : 060518.M

Volume Inj. :

Signal Phase :

Signal Info :

50 PPB BTEX STANDARD
NWTPH-Gx18TEX method

