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Memorandum

To: Adam Harris, Washington State Department of Ecology

Copies: Tom Lovejoy, Puget Sound Truck Lines

From: Brett Beaulieu, LHG

Date: November 30, 2016

Project No: PSTL Longview

Re: **Puget Sound Truck Lines Longview Site—VCP SW1429**
2016 Groundwater Monitoring Results and Summary of Soil Compliance

OVERVIEW

This data report has been prepared to summarize the groundwater monitoring results for the Puget Sound Truck Lines Longview site (Site) in Longview, Washington (Figure 1) and to describe next steps proposed for the Site to meet cleanup requirements under the Voluntary Cleanup Program (VCP). The proposed next step is a review by the Washington State Department of Ecology (Ecology) and a statement indicating whether further action is needed for soil cleanup. Groundwater monitoring will continue until compliance can be demonstrated for groundwater.

The Site is an approximately 3.3-acre parcel located at 146 Industrial Way in Longview, Washington, in an industrial area between the Columbia and Cowlitz Rivers (Figure 1). The Site is currently used by a shipping company with truck storage and maintenance activities. A site investigation in late 2011 confirmed diesel impacts in soil and groundwater that were likely due to surface spills, leaks, and overfilling associated with a former 10,000-gallon diesel aboveground storage tank (AST). The AST was removed, and soil contaminated with diesel-range organics (DRO) at concentrations greater than Model Toxics Control Act (MTCA) Method A cleanup level (CUL) was excavated in 2012. Approximately 2,850 tons of soil was excavated and disposed of at a landfill (3 Kings Environmental 2012). A summary of soil verification sampling is presented in this report.

The Site was entered into the VCP in October 2014 under the identifier SW1429. Groundwater impacted with DRO was detected following soil cleanup activities. The Site is currently undergoing groundwater monitoring. Four monitoring wells were installed at the edges of the previously excavated area, and a total of nine quarterly groundwater monitoring events have been completed in accordance with the Groundwater Compliance Sampling and Analysis Plan (SAP; Floyd|Snider 2014a).

The objective of groundwater monitoring is to provide data for establishing compliance with the MTCA Method A groundwater standard for DRO, so that Ecology can issue a "No Further Action" (NFA) letter indicating that the groundwater cleanup has been completed. This report summarizes groundwater sampling and analysis activities and results from the first, second, and third quarter sampling events in 2016. The results of the 2014 and 2015 quarterly events were presented in previous reports (Floyd|Snider 2014b, 2015).

WORK COMPLETED

Three quarterly groundwater sampling events were conducted during this reporting period. These sampling events took place on March 30, 2016; June 23, 2016; and September 8, 2016. Work was completed in accordance with the SAP, except where noted below.

Water Level Measurement

During groundwater sampling events, water level measurements were collected from all four wells prior to well purging to provide an indication of the potentiometric surface. During the September 2016 sampling event, the MW-1 well monument was submerged beneath ponded stormwater, and the well was inaccessible for water level measurements or sampling.

Groundwater Sampling and Analysis

Groundwater samples were collected from all four monitoring wells for each sampling event, except as noted above in September 2016, when MW-1 was inaccessible. In accordance with the SAP, groundwater samples and field duplicates were collected using standard low-flow sampling methods, submitted to Friedman and Bruya, Inc. (FBI) under standard chain-of-custody procedures, and analyzed by NWTPH-Dx for total petroleum hydrocarbons (TPH).

Investigation-Derived Waste

All water generated during groundwater sampling was collected and transferred to a U.S. Department of Transportation–approved 55-gallon steel drum. The lidded, sealed, and labelled drum is being stored on-site until it is full and must be disposed of off-site or until all groundwater monitoring has concluded.

On November 24, 2015, two drums of purge water generated during previous sampling were transported off-site for disposal at PRS Group, in Tacoma, Washington. A bill of lading is included as Attachment 1.

COMPLIANCE MONITORING RESULTS

Data Validation

For each sampling event in the reporting period, a compliance screening, Stages 1 and 2A, data quality review was performed on TPH data resulting from laboratory analysis. The analytical data were validated in accordance with the U.S. Environmental Protection Agency (USEPA) *National Functional Guidelines for Superfund Organic Methods Data Review* (USEPA 2014).

Five groundwater samples were submitted for the March 2016 event, and four groundwater samples were submitted for the June 2016 and September 2016 events. These samples were submitted in delivery groups FB603536, FB606442, and FB609132 to FBI in Seattle, Washington for chemical analysis by NWTPH-Dx for TPH. For all sample delivery groups, the analytical holding times were met, and the method blanks had no detections. The surrogate, matrix spike (MS), matrix spike duplicate (MSD), laboratory control sample (LCS) and laboratory control sample duplicate (LCSD) recoveries, and MS/MSD and LCS/LCSD relative percent differences all met USEPA requirements.

As part of the validation of TPH data, the detectable hydrocarbons and/or organics within the diesel, gasoline, or residual hydrocarbon chromatogram ranges were reviewed relative to the appropriate laboratory standard. If the hydrocarbons were not identifiable based on a poor chromatographic match with the standards, the data were qualified “MP” to reflect a poor match, and the interpretive qualifier used for database entry and project reporting was “JM” to indicate estimated concentrations due to the poor chromatographic match. Similarly, if the hydrocarbons provided a good chromatographic match with the standards, the data were qualified “MG” to reflect a good match, and no interpretive qualifier was used for database entry or project reporting.

Chromatograms were compared to the provided laboratory standard and are considered to have an adequate match to the standards.

All data are determined to be of acceptable quality for use as qualified.

Water Level Measurements and Potentiometric Surface

Water level measurements, elevations, and horizontal hydraulic gradients are reported in Table 1. Groundwater elevations and potentiometric surface contours for each event are illustrated in Figures 2, 3, and 4. Average water levels for each event are plotted on Figures 5, 6, 7, and 8. Water level elevations fluctuated by approximately 4 feet over the three monitoring events, from a high of greater than 12 feet relative to the North American Vertical Datum of 1988 (NAVD 88) in March to a low of approximately 8 feet NAVD 88 in September.

Potentiometric contours indicate an overall southerly groundwater flow direction that varied from southerly during the March and June events to southeasterly during the September event.

Water level data indicate low horizontal gradients ranging from approximately 0.001 to 0.003 feet per foot (ft/ft), which is consistent with the flat topography in the vicinity.

Groundwater Analytical Results

Analytical results for DRO in groundwater are shown in Table 2 and as time-concentration plots in Figures 5, 6, 7, and 8. The complete analytical data packages are presented in Attachment 2. Analytical results presented in this data report have been submitted to Ecology's Environmental Information Management (EIM) system.

Groundwater results for the 9-month reporting period are generally consistent with the previous year. Results for all four monitoring wells have fluctuated at concentrations close to the MTCA Method A CUL for DRO of 500 micrograms per liter (µg/L) since the wells were first sampled in March 2014. In the most recent event, September 2016, the result for only one of the three monitoring wells sampled exceeded the CUL, and the DRO concentrations in the three wells ranged from 380 to 510 µg/L.

Aside from the potentially anomalous result of 760 µg/L at MW-1 in June 2016, the overall trend in all four wells is stable or decreasing concentrations. Periodic increases in DRO concentration appear to be correlated with periods of low water table elevation, and periodic decreases in DRO concentration appear to be correlated with periods of high water table elevation. For example, DRO concentrations in all four monitoring wells were less than the CUL in the March 2016 event, when the water levels were approximately 12 feet NAVD 88. In June, when the water levels were below 10 feet NAVD 88, DRO concentrations exceeded the CUL in three of the four monitoring wells.

This pattern, together with the low transmissivity of the shallow soils and flat gradients, suggests that concentrations are largely controlled by dilution and that the area with DRO concentrations in excess of the CUL is stable and continues to be approximately defined by the four monitoring wells.

SUMMARY OF PREVIOUS SOIL RESULTS AND UPDATED CONCEPTUAL SITE MODEL

In January 2013, Ecology issued an Initial Investigation Field Report that listed the Site on the Contaminated or Suspected Contaminated Sites List (CSCSL) based on the presence of DRO in groundwater at concentrations greater than the MTCA CUL (Ecology 2013). The Ecology report included a review of the Limited Phase II Environmental Site Assessment report (Adapt Engineering 2011) and the Remedial Investigation and Cleanup Report (3 Kings Environmental 2012), concluding that the 2012 soil removal "eliminated the soil source" and that "confirmation soil sampling following removal detected only minor amounts of DRO contaminant, all well below CULs." The listing characterized the soil medium as "RB–Remediated–Below," defined as "the contaminant was remediated, and no area of the site contains this contaminant above cleanup standards (for example–complete removal of contaminated soils)."

Both our review of the site data and our updated conceptual site model continue to support these conclusions. The following summary and updated conceptual site model are intended to assist Ecology in its review of the record to confirm the adequacy of the soil cleanup. At Ecology's request, the data from these investigations have been uploaded to EIM.

Soil Delineation, Excavation, and Confirmation Sampling

The Phase I and Phase II investigations identified and evaluated soil and groundwater associated with potential recognized environmental conditions including a floor drain outfall, a former waste oil underground storage tank (UST) that had been decommissioned and removed, and a 10,000-gallon diesel AST. The results of the investigations "did not indicate the presence of contamination associated with the former waste oil UST or the floor drain discharge area." A Geoprobe® groundwater screening sample (GW-2) collected from the vicinity of the former waste oil UST contained DRO at a concentration greater than the MTCA Method A CUL of 500 µg/L, although oil-range organics (ORO) were not detected in groundwater, no soil contamination was identified (SB-2), and subsequent soil and groundwater sampling in this location, described below, resulted in no exceedances of the CULs. Near the former AST at location SB-1/GW-1, where surface staining was observed, DRO was detected in soil at concentrations greater than the MTCA Method A CUL of 2,000 milligrams per kilogram (mg/kg) and in groundwater at concentrations greater than the MTCA Method A CUL (500 µg/L). The report concluded that soil and groundwater had been contaminated by surface spills at the diesel AST (Adapt Engineering 2011).

The AST that was the apparent source of the DRO contamination was decommissioned by removal, and soil and groundwater were characterized by sampling test pits and direct-push borings. Additional investigations beginning in January 2012 confirmed the absence of petroleum contamination at the location of the former waste oil UST and delineated the extent of the DRO impacts associated with the diesel AST.

During soil sampling in January 2012, DRO concentrations in test pit soil samples collected from the soil-water interface at location TP-11, where the former waste oil UST was located, were less than the detection limit (3 Kings Environmental 2012). The soil sampling results from TP-11 indicated DRO concentrations less than 19.9 mg/kg and ORO concentrations less than 66.5 mg/kg, less than the MTCA Method A CUL (2,000 mg/kg). Concentrations of DRO and ORO in groundwater samples collected from the open test pit at TP-11 were also less than the detection limits of 76 µg/L for DRO and 190 µg/L for ORO. The other test pits defined the extent of DRO-contaminated soil and provided groundwater screening samples to characterize the DRO impacts to groundwater.

In January and February 2012, a remedial excavation was undertaken to remove the diesel contamination associated with the former AST. The excavation measured approximately 65 by 65 feet and extended approximately 10 feet deep. Approximately 2,850 tons of soil was excavated and disposed of at a landfill. Ten confirmation soil samples were collected from the

excavation sidewalls and corners at depths ranging from 3 to 7 feet below ground surface (bgs), from the center of the excavation floor at a depth of 8 feet bgs, and from additional test pits outside the excavation at depths of 7 feet bgs. The post-excavation soil sampling results for DRO ranged from less than the detection limit (approximately 20 mg/kg) to a maximum concentration of 1,810 mg/kg. These results confirmed the effectiveness of the excavation in removing soil with DRO concentrations greater than 2,000 mg/kg, supporting the conclusions of the remedial investigation and cleanup report that the petroleum-contaminated soil attributed to the AST is no longer present at the Site, but petroleum impacts in groundwater remain (3 Kings Environmental 2012).

This conclusion was further supported by the results of soil sampling in 2014 during the advancement of borings for the installation of the four Site monitoring wells, MW-1 through MW-4. DRO concentrations in soil from depths at which indications of hydrocarbons had been observed, including at the soil-water interface, ranged from less than a detection limit of 50 mg/kg to a maximum concentration of 1,300 mg/kg. These results confirm no exceedances of the MTCA Method A soil CUL of 2,000 mg/kg (Floyd|Snider 2014b).

Updated Conceptual Site Model

The conceptual site model, which is based on soil and groundwater investigation and soil confirmation sampling, indicates that DRO-contaminated soil at the Site has been excavated, leaving soil with DRO concentrations less than MTCA Method A soil CUL. However, lingering DRO concentrations in groundwater in the uppermost water-bearing unit exceed the MTCA Method A groundwater CUL.

The surficial geology of the Site generally consists of approximately 2 feet of gravel fill material, underlain by mixed alluvium floodplain deposits. Alluvial material in the vicinity of the excavation was logged as silty clay to a depth of approximately 10 feet. Alluvial deposits reportedly extend to at least 100 feet in this area.

Water in the Site vicinity has generally been encountered between 1 and 8 feet bgs. The hydraulic conductivity of the shallow water-bearing unit is considered very low based on the observed soil classification. The unit consists predominantly of silt and silty clay, with an apparent 6-inch-thick zone of fractured silt and clay at a depth of approximately 7.5 feet. Indications of hydrocarbons including odors and light sheens were observed at this depth in post-excavation borings advanced to install the Site monitoring wells, although the soil sampling results indicated no exceedances of the MTCA Method A soil CUL for DRO, suggesting that the encountered DRO is predominantly in groundwater, not soil (Floyd|Snider 2014b).

Available potentiometric contours from 2014 to 2016 indicate a general southerly direction of groundwater flow. The greatest variations in the apparent flow direction are seen during September monitoring events, when water levels are generally near their lowest levels of the year, suggesting a temporary and local condition that likely does not reflect the overall southerly

flow pattern. The variation in the apparent local groundwater flow direction is consistent with the Site location in a flat, low area (approximately 10 feet above mean sea level) within the floodplain of the Cowlitz and Columbia Rivers. The broader regional groundwater flow direction is presumed to be northeasterly, toward the Cowlitz River. Observed low hydraulic gradients on the order of 0.001 ft/ft, combined with overall low hydraulic conductivity, are consistent with an extremely slow groundwater seepage velocity, with negligible groundwater flow and a very low potential for DRO transport in groundwater.

There are no apparent pathways of exposure to DRO in groundwater from the Site. The Site is used for industrial purposes and is surrounded by industrial properties. Shallow groundwater in the silt and silty clay alluvium is not a source of drinking water; therefore, no exposure to DRO is expected through drinking water.

NEXT STEPS

Based on the removal of contaminated soil in 2012 and subsequent confirmation sampling, we request a letter from Ecology indicating that the soil cleanup action has been completed and no further action is needed for soil. For groundwater, we propose a continuation of the current course of quarterly monitoring and annual reporting. Additional details are provided below.

No Further Action for Soil Request and Other Required Information

To provide clarity and predictability regarding compliance status, we request that Ecology issue an opinion letter to document the adequacy of soil remediation, based on the post-excavation soil data and subsequent groundwater monitoring (3 Kings Environmental 2012; Floyd|Snider 2014b, 2015).

As part of this step, we also request that Ecology review the Site status in terms of the MTCA requirements for analytical testing for petroleum releases listed in Table 830-1 of Washington Administrative Code, Section 173-340-900, the assessment of the vapor intrusion pathway, and the terrestrial ecological evaluation. A summary of these conditions was presented in a memorandum to Ecology dated October 14, 2015 (Floyd|Snider 2015).

Quarterly Groundwater Monitoring

Groundwater monitoring results at the Site indicate relatively stable DRO concentrations, with some seasonal fluctuation and longer term trends suggesting a gradual decline in DRO concentrations. Groundwater monitoring will continue on a quarterly basis until the results demonstrate compliance with the MTCA Method A CUL for DRO and support a request for an NFA letter from Ecology indicating that the groundwater cleanup has been completed. It is expected that four consecutive quarters of results less than the CUL would establish a suitable basis for a groundwater compliance demonstration. Groundwater data will continue to be reported to Ecology annually and will continue to be submitted to EIM.

REFERENCES

Adapt Engineering, Inc. 2011. *Limited Phase II Environmental Site Assessment, 146 Industrial Way, Longview, Washington*. Prepared for Puget Sound Freight Lines. 29 December.

3 Kings Environmental, Inc. 2012. *Remedial Investigation and Cleanup Report, Puget Sound Freight Lines Facility—146 Industrial Way, Longview, Washington*. Prepared for Puget Sound Freight Lines. 24 December.

Floyd|Snider. 2014a. *Puget Sound Truck Lines, Longview, Groundwater Compliance Sampling and Analysis Plan*. Memorandum to Tom Lovejoy, Puget Sound Freight Lines, from Brett Beaulieu, Floyd|Snider. 13 January.

_____. 2014b. *Puget Sound Truck Lines Longview Site—Groundwater Compliance Well Installation and Monitoring Results*. Memorandum to Scott Rose, VCP Unit Manager, Washington State Department of Ecology, from Brett Beaulieu, Floyd|Snider. 3 September.

_____. 2015. *Puget Sound Truck Lines Longview Site—VCP SW1429, 2014–2015 Groundwater Monitoring Results*. Memorandum to Eugene Radcliff, VCP Unit Manager, Washington State Department of Ecology, from Brett Beaulieu, Floyd|Snider. 14 October.

U.S. Environmental Protection Agency (USEPA). 2014. *National Functional Guidelines for Superfund Organic Methods Data Review.* OSWER 9355.0-132. EPA-540-R-014-002. Office of Superfund Remediation and Technology Innovation (OSRTI), Washington, D.C. August.

Washington State Department of Ecology (Ecology). 2013. Initial Investigation Field Report for ERTS 635466, Parcels 10132, 10134, 10137, Cowlitz County. Report investigator: Chris Matthews. Submitted 17 January.

LIST OF ATTACHMENTS

Table 1	Water Level Elevations and Horizontal Gradients
Table 2	Groundwater Analytical Results for Diesel-Range Organics
Figure 1	Vicinity Map
Figure 2	Potentiometric Surface and Groundwater Elevations, March 30, 2016
Figure 3	Potentiometric Surface and Groundwater Elevations, June 23, 2016
Figure 4	Potentiometric Surface and Groundwater Elevations, September 8, 2016
Figure 5	MW-1 Time Concentration Plot of Diesel-Range Organics in Groundwater
Figure 6	MW-2 Time Concentration Plot of Diesel-Range Organics in Groundwater
Figure 7	MW-3 Time Concentration Plot of Diesel-Range Organics in Groundwater
Figure 8	MW-4 Time Concentration Plot of Diesel-Range Organics in Groundwater
Attachment 1	Bill of Lading for Investigation-Derived Waste
Attachment 2	Laboratory Analytical Data (provided on disc)

Geologist Certification

This document was prepared by Floyd|Snider under the professional supervision of Brett Beaulieu.

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Name: Brett Beaulieu, LHG
Title: Hydrogeologist
Date: 11/30/2016

Tables

Table 1
Water Level Elevations and Horizontal Gradients

Well	Total Depth (feet from top of casing)	Top of Well Casing (feet NAVD 88)	Depth to Water (feet)	Groundwater Elevation (feet NAVD 88)	Horizontal Gradient (feet/foot)
September 8, 2016					
MW-1	13.44	14.24	NM[1]	NM[1]	0.003
MW-2	13.35	14.08	5.85	8.23	
MW-3	14.12	14.05	5.81	8.24	
MW-4	14.42	14.24	5.86	8.38	
June 23, 2016					
MW-1	13.44	14.24	4.33	9.91	0.001
MW-2	13.35	14.08	4.20	9.88	
MW-3	14.12	14.05	4.25	9.80	
MW-4	14.42	14.24	4.30	9.94	
March 30, 2016					
MW-1	13.44	14.24	2.13	12.11	0.001
MW-2	13.35	14.08	2.01	12.07	
MW-3	14.12	14.05	2.08	11.97	
MW-4	14.42	14.24	2.17	12.07	
June 9, 2015					
MW-1	13.44	14.24	4.65	9.59	0.001
MW-2	13.35	14.08	4.54	9.54	
MW-3	14.12	14.05	4.56	9.49	
MW-4	14.42	14.24	4.67	9.57	
March 17, 2015					
MW-1	13.44	14.24	2.46	11.78	0.002
MW-2	13.35	14.08	2.37	11.71	
MW-3	14.12	14.05	2.41	11.64	
MW-4	14.42	14.24	2.49	11.75	
December 22, 2014					
MW-1	13.44	14.24	1.75	12.49	0.003
MW-2	13.35	14.08	1.64	12.44	
MW-3	14.12	14.05	1.76	12.29	
MW-4	14.42	14.24	1.84	12.40	
September 24, 2014					
MW-1	13.44	14.24	5.92	8.32	0.001
MW-2	13.35	14.08	5.74	8.34	
MW-3	14.12	14.05	5.76	8.29	
MW-4	14.42	14.24	5.99	8.25	

Table 1
Water Level Elevations and Horizontal Gradients

Well	Total Depth (feet from top of casing)	Top of Well Casing (feet NAVD 88)	Depth to Water (feet)	Groundwater Elevation (feet NAVD 88)	Horizontal Gradient (feet/foot)
June 24, 2014					
MW-1	13.44	14.24	3.85	10.39	0.002
MW-2	13.35	14.08	3.76	10.32	
MW-3	14.12	14.05	3.80	10.25	
MW-4	14.42	14.24	3.93	10.31	
March 19, 2014					
MW-1	13.44	14.24	1.14	13.10	0.004
MW-2	13.35	14.08	1.06	13.02	
MW-3	14.12	14.05	1.20	12.85	
MW-4	14.42	14.24	1.23	13.01	

Note:

1 Unable to measure; well monument was inaccessible.

Abbreviations:

NAVD 88 North American Vertical Datum of 1988

NM Not measured

Table 2
Groundwater Analytical Results for Diesel-Range Organics

Well	Date	Diesel-Range Organics (µg/L) by NWTPH-Dx
MW-1	9/8/2016[1]	NA
	06/23/16	760
	03/30/16	280
	03/30/16 (Duplicate)	300
	06/09/15	530
	03/17/15	350
	12/22/14	410
	09/24/14	380 J
	09/24/14 (Duplicate)	430 J
	06/24/14	390 JM
	03/19/14	390
	03/19/14 (Duplicate)	490
MW-2	09/08/16	440
	09/08/16 (Duplicate)	380
	06/23/16	590
	03/30/16	300
	06/09/15	660
	06/09/15 (Duplicate)	670
	03/17/15	390
	03/17/15 (Duplicate)	390
	12/22/14	480
	12/22/14 (Duplicate)	520
	09/24/14	620 J
	06/24/14	540 JM
	06/24/14 (Duplicate)	540 JM
	03/19/14	700
MW-3	09/08/16	400
	06/23/16	400
	03/30/16	370
	06/09/15	530
	03/17/15	310
	12/22/14	480
	09/24/14	420 J
	06/24/14	470 JM
	03/19/14	560

Table 2
Groundwater Analytical Results for Diesel-Range Organics

Well	Date	Diesel-Range Organics (µg/L) by NWTPH-Dx
MW-4	09/08/16	510
	06/23/16	600
	03/30/16	480
	06/09/15	580
	03/17/15	460
	12/22/14	440
	09/24/14	550 J
	06/24/14	560 JM
	03/19/14	680

Note:

1 Unable to sample; well monument was inaccessible.

Abbreviations:

µg/L Micrograms per liter

NA Not analyzed

Qualifiers:

J Analyte was detected; the concentration is considered an estimate.

JM Analyte was detected; the concentration is considered an estimate due to poor chromatographic match to standard.

U Analyte was not detected at the given reporting limit.

Figures

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Groundwater Monitoring Results
Puget Sound Truck Lines Site
Longview, Washington

Figure 1
Vicinity Map

I:\GIS\Projects\PSTL-Longview\MXD\Figure 1 Vicinity Map.mxd 10/13/2015

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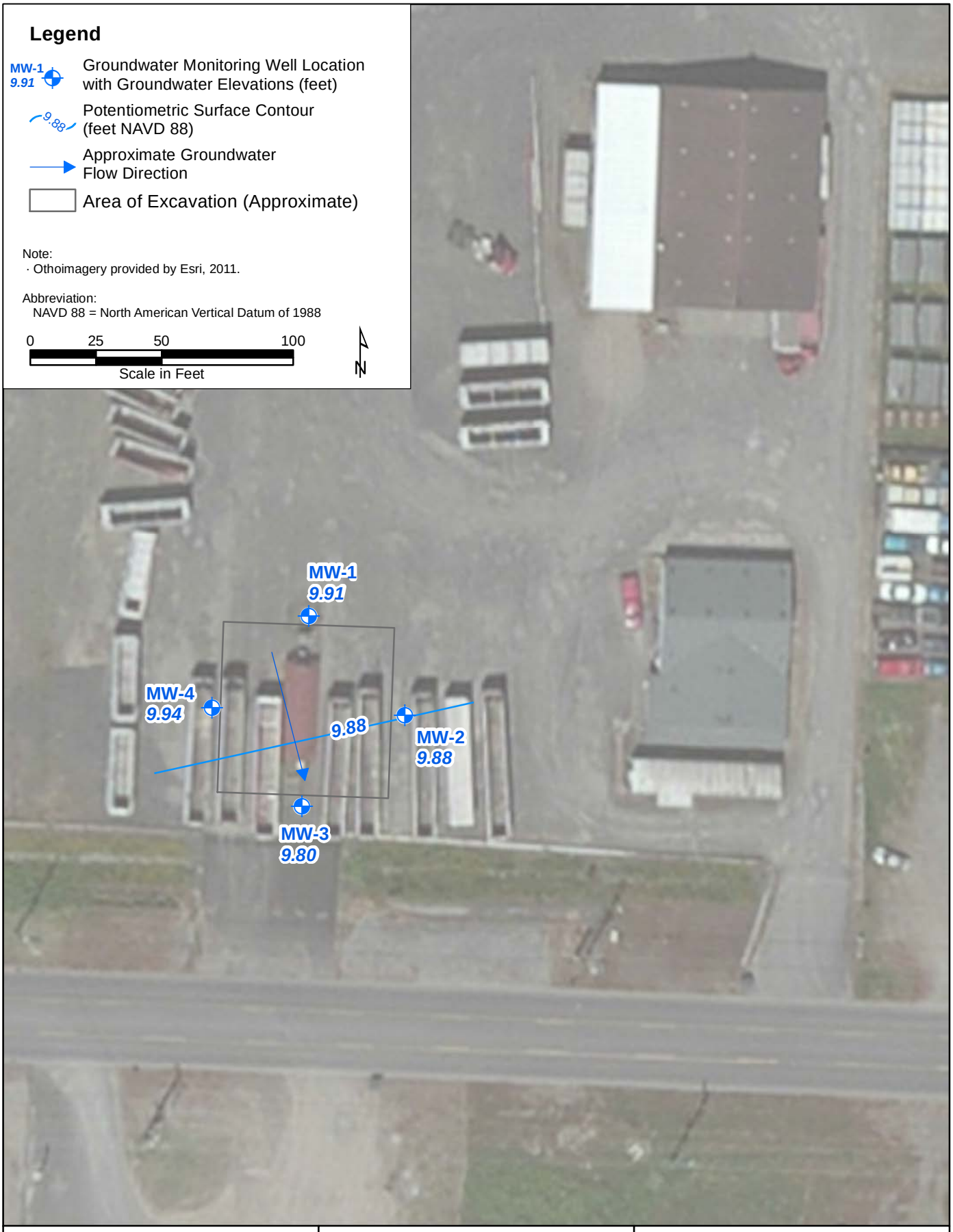
Groundwater Monitoring Results
Puget Sound Truck Lines Site
Longview, Washington

Figure 2
Potentiometric Surface and Groundwater Elevations
March 30, 2016

I:\GIS\Projects\PSTL-Longview\MXD\Compliance Monitoring Report\2016\Figure 2 Potentiometric Surface and Groundwater Elevations March 30, 2016.mxd 11/1/2016



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Groundwater Monitoring Results
Puget Sound Truck Lines Site
Longview, Washington

Figure 3
Potentiometric Surface and Groundwater Elevations
June 23, 2016

I:\GIS\Projects\PSTL-Longview\MXD\Compliance Monitoring Report\2016\Figure 3 Potentiometric Surface and Groundwater Elevations June 23, 2016.mxd 11/1/2016

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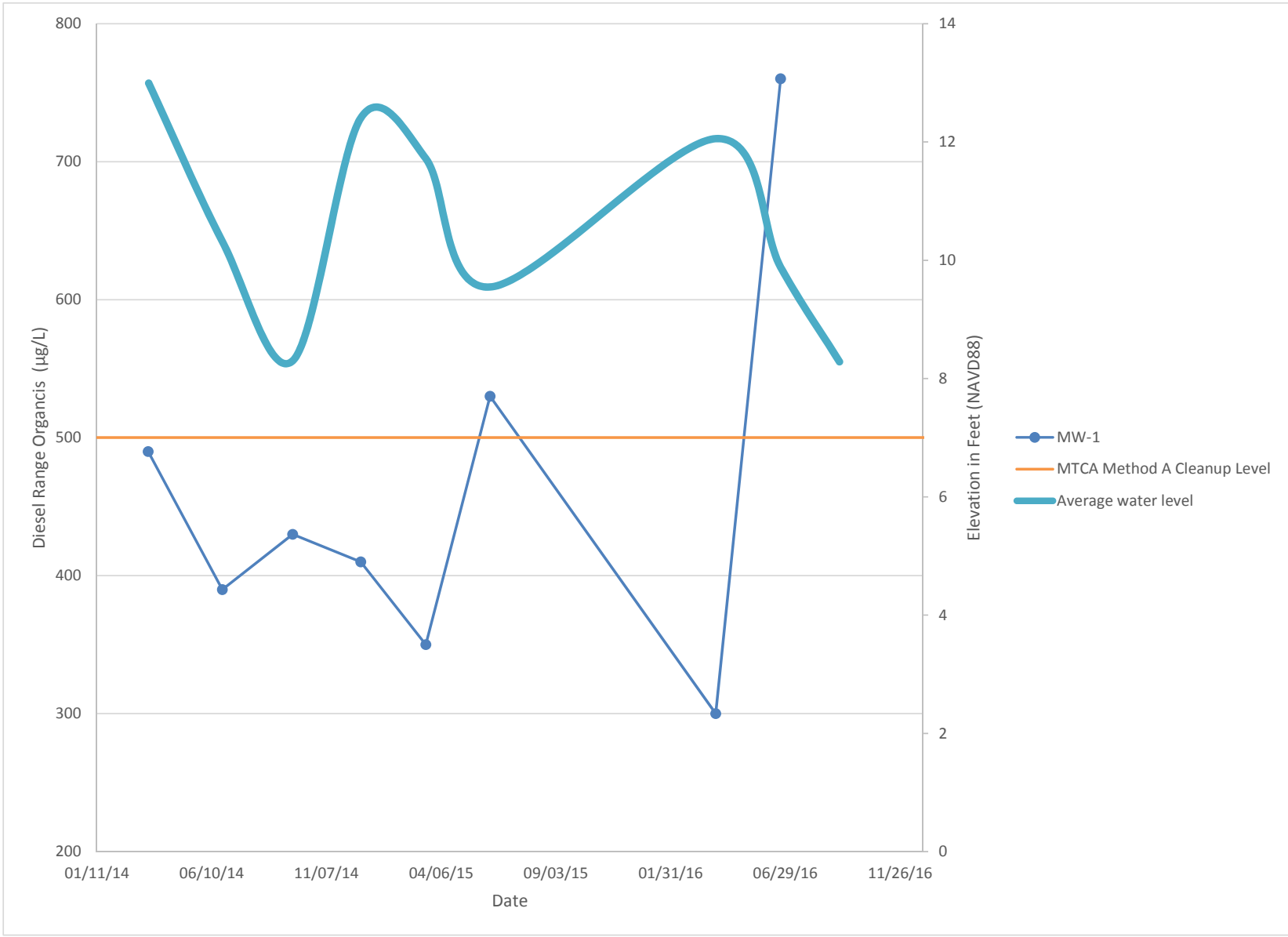
Groundwater Monitoring Results
Puget Sound Truck Lines Site
Longview, Washington

Figure 4
Potentiometric Surface and Groundwater Elevations
September 8, 2016

I:\GIS\Projects\PSTL-Longview\MXD\Compliance Monitoring Report\2016\Figure 4 Potentiometric Surface and Groundwater Elevations September 8, 2016.mxd 11/1/2016



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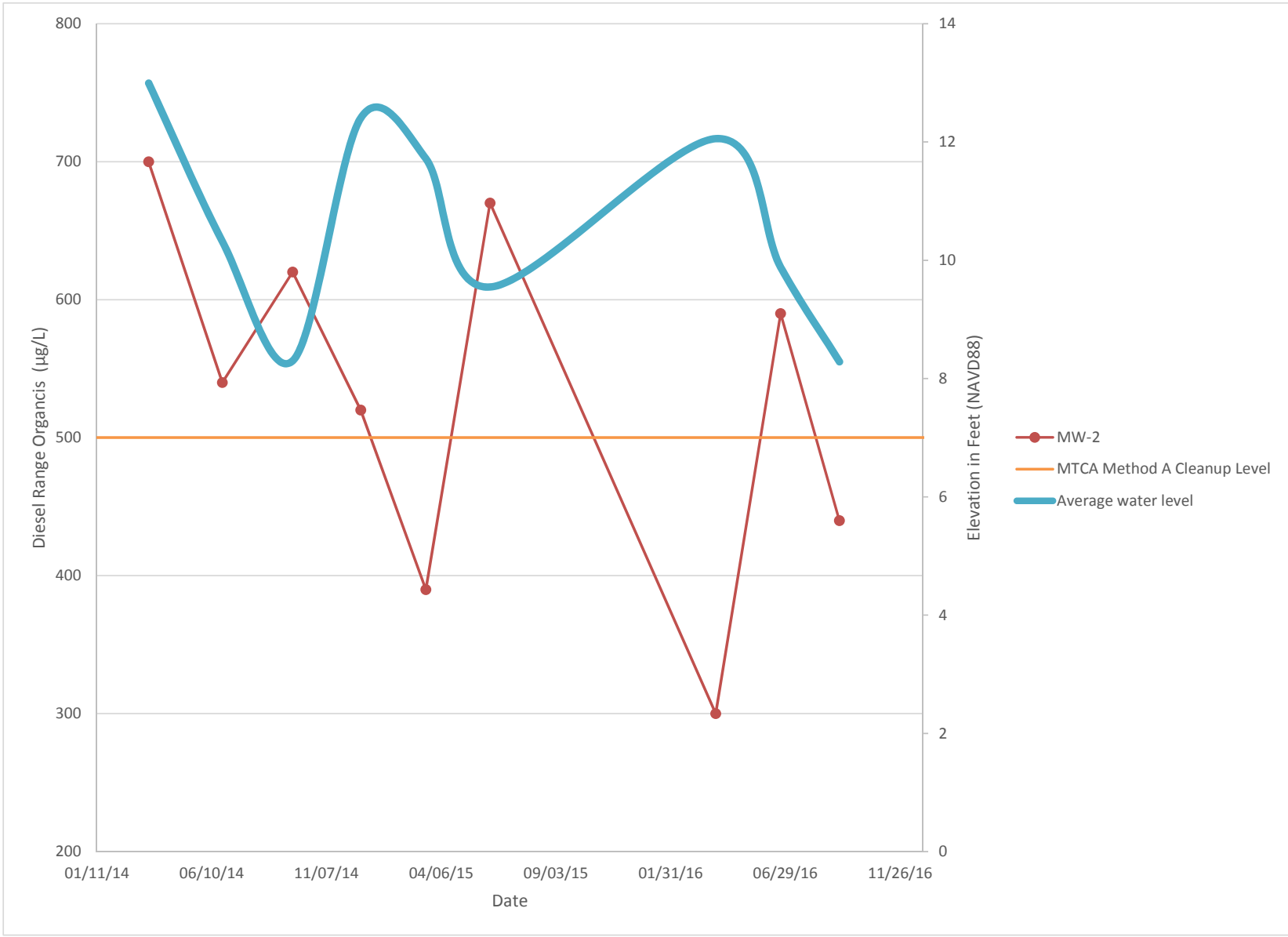
Groundwater Monitoring Results
Puget Sound Truck Lines Site
Longview, Washington

Figure 5
MW-1 Time Concentration Plot of
Diesel-Range Organics in Groundwater



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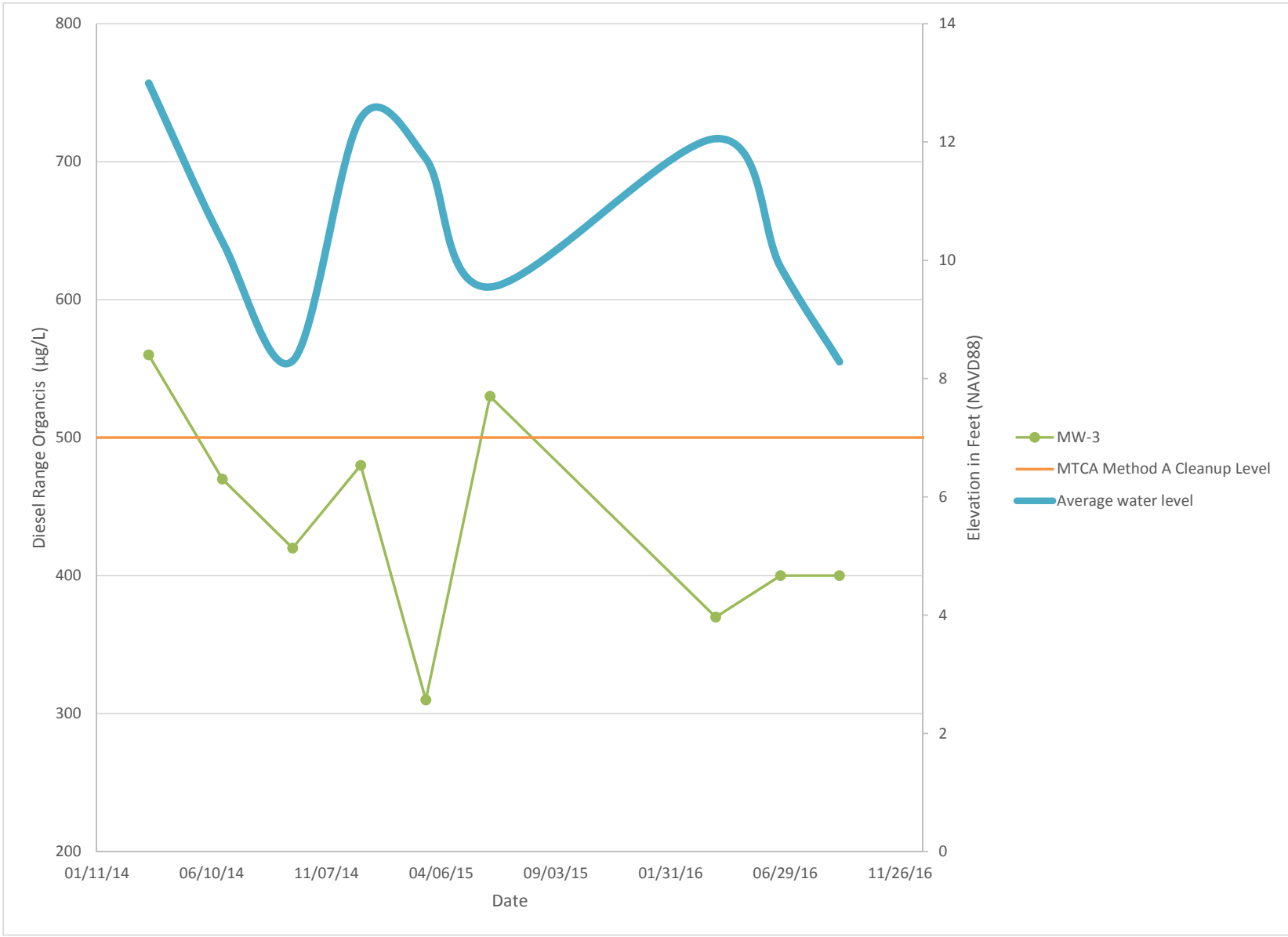
Groundwater Monitoring Results
Puget Sound Truck Lines Site
Longview, Washington

Figure 6
MW-2 Time Concentration Plot of
Diesel-Range Organics in Groundwater



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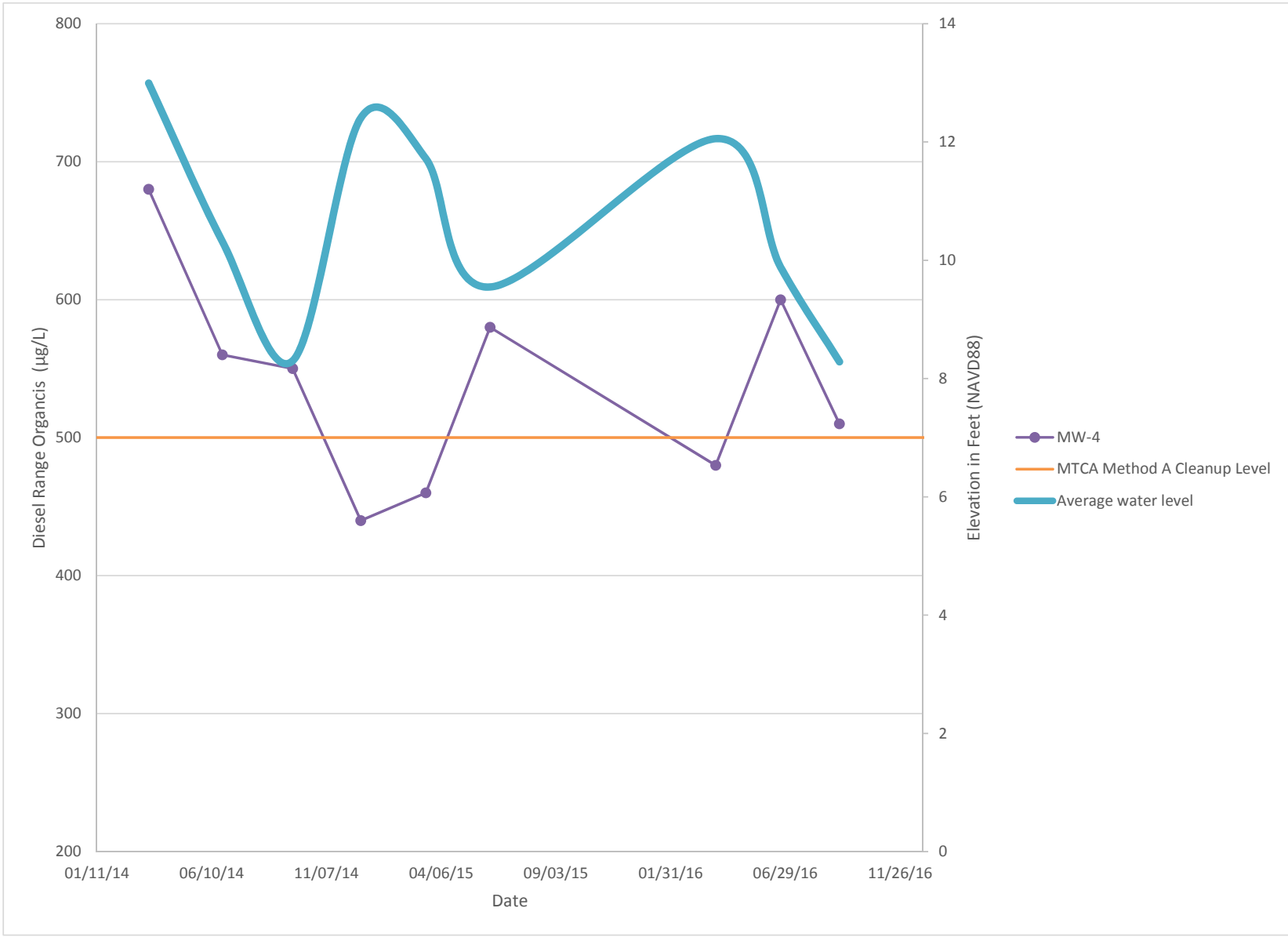
Groundwater Monitoring Results
Puget Sound Truck Lines Site
Longview, Washington

Figure 7
MW-3 Time Concentration Plot of
Diesel-Range Organics in Groundwater



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Groundwater Monitoring Results
Puget Sound Truck Lines Site
Longview, Washington

Figure 8
MW-4 Time Concentration Plot of
Diesel-Range Organics in Groundwater

Attachment 1
Bill of Lading for Investigation-Derived Waste

Northern ENVIRONMENTAL

2661 North Pearl St. #145
Tacoma, WA 98407
253.503.3096

DATE	WORK ORDER #	TICKET #
11-24-15	50417	22804

OPERATOR	LABORER
BRIAN	

Customer FLOYD SNIDER INC. Job Phone 206-582-8223

Job Address 146 INDUSTRIAL WAY C, S, Z LONGVIEW WA

TRAVEL TO SITE		ON SITE		DUMP OUT COMPLETED	RETURN TO SHOP	TRUCK #
START	STOP	IN	OUT			
11:30	12:00	12:00	12:30		1530	107

QUANTITY	JOB DESCRIPTION	RATE	TOTAL
	2 DRUMS OF NON HAZARDOUS WASTE		
	15% FUEL CHARGE		

DISPOSAL: ☐ ON SITE ☒ OFF SITE

LOCATION: PRS GROUP TACOMA WA

SUBTOTAL	
TAX	
TOTAL	

SIGNATURE BELOW ACKNOWLEDGES PAYMENT TERMS ON REVERSE:

CUSTOMER NAME: _____ SIGNATURE: _____

Northern ENVIRONMENTAL
EPAID# WAH000039211
USDOT# 2133996
253.212.5446

B.O.L. # 1767

SHIPPING PAPER

DELIVERY DATE	WO #
11-24-15	50417

SHIPPER / CUSTOMER: FLOYD SNIDER INC.	CONTACT NAME: GABE CISERNOS
ADDRESS: 146 INDUSTRIAL WAY	PHONE #: 206-582-8223
CITY, STATE, ZIP: LONGVIEW WA	
CONSIGNEE / FACILITY: PLS GROUP	CONTACT NAME: JAY
ADDRESS: 3003 TAYLOR WAY	PHONE #: 253 383-4175
CITY, STATE, ZIP: TACOMA WA 98421	

HM	US DOT Description *(Including Proper Shipping Name, Hazard Class, and ID Number)*	Containers No.	Containers Type	Total Quantity	UOM	CHLOR	pH
A	**MATERIAL NOT REGULATED BY DOT (USED OIL AND WATER)**						
B	**MATERIAL NOT REGULATED BY DOT (SPENT ANTIFREEZE)**						
C	**MATERIAL NOT REGULATED BY DOT (SPENT OIL ABSORBENTS AND DEBRIS)**						
D	**COMBUSTIBLE LIQUID N.O.S., 3, NA1993, PGIII, RQ (100) (CONTAINS DIESEL & GASOLINE) ERG 128**						
E	NON REGULATED PETROLEUM CONTAMINATED SOIL AND H_2O	02	DM	075	USG		
F							

Special Handling Instruction and Additional Information:

A. PROFILE #

B. PROFILE #

C. PROFILE #

D. PROFILE #

E. PROFILE # 4964-BOC

F. PROFILE #

SHIPPER'S CERTIFICATION: "I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packaged, marked and labelled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations." I also certify that all times listed above are true and correct.

		MONTH	DAY	YEAR
(SHIPPER) PRINT OR TYPE NAME: X BRIAN STANLOCK	SIGNATURE: X	11	24	15
(CARRIER/TRANSPORTER) PRINT OR TYPE NAME: X BRIAN STANLOCK	SIGNATURE: X	11	24	15
(CONSIGNEE/FACILITY) PRINT OR TYPE NAME: X PLS	SIGNATURE: X	11	24	15

Attachment 2
Laboratory Analytical Data

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
Yelena Aravkina, M.S.
Michael Erdahl, B.S.
Arina Podnozova, B.S.
Eric Young, B.S.

3012 16th Avenue West
Seattle, WA 98119-2029
(206) 285-8282
fbi@isomedia.com
www.friedmanandbruya.com

April 4, 2016

Brett Beaulieu, Project Manager
Floyd-Snider
Two Union Square, Suite 600
601 Union St
Seattle, WA 98101

Dear Mr. Beaulieu:

Included are the results from the testing of material submitted on March 30, 2016 from the PSTL-Longview, F&BI 603536 project. There are 4 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

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

Sincerely,

FRIEDMAN & BRUYA, INC.

Michael Erdahl
Project Manager

Enclosures
FDS0404R.DOC

CASE NARRATIVE

This case narrative encompasses samples received on March 30, 2016 by Friedman & Bruya, Inc. from the Floyd-Snider PSTL-Longview, F&BI 603536 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Floyd-Snider
603536 -01	MW-1-GW-4-14
603536 -02	MW-13-GW-4-14
603536 -03	MW-2-GW-4-14
603536 -04	MW-3-GW-4-14
603536 -05	MW-4-GW-4-14

All quality control requirements were acceptable.

Date of Report: 04/04/16
Date Received: 03/30/16
Project: PSTL-Longview, F&BI 603536
Date Extracted: 03/31/16
Date Analyzed: 03/31/16

RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL USING METHOD NWTPH-Dx

Results Reported as ug/L (ppb)

Sample ID Laboratory ID	Diesel Range (C_{10}-C_{25})	Surrogate (% Recovery) (Limit 41-152)
MW-1-GW-4-14 603536-01	280	82
MW-13-GW-4-14 603536-02	300	84
MW-2-GW-4-14 603536-03	300	80
MW-3-GW-4-14 603536-04	370	86
MW-4-GW-4-14 603536-05	480	82
Method Blank 06-620 MB	<50	87

Date of Report: 04/04/16
Date Received: 03/30/16
Project: PSTL-Longview, F&BI 603536

QUALITY ASSURANCE RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL USING METHOD NWTPH-Dx

Laboratory Code: 603536-03 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Diesel	ug/L (ppb)	5,000	300	103	103	50-150	0

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Diesel	ug/L (ppb)	2,500	96	86	63-142	11

Data Qualifiers & Definitions

a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.

b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.

ca - The calibration results for the analyte were outside of acceptance criteria. The value reported is an estimate.

c - The presence of the analyte may be due to carryover from previous sample injections.

cf - The sample was centrifuged prior to analysis.

d - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.

dv - Insufficient sample volume was available to achieve normal reporting limits.

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

fc - The compound is a common laboratory and field contaminant.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. Variability is attributed to sample inhomogeneity.

hs - Headspace was present in the container used for analysis.

ht – The analysis was performed outside the method or client-specified holding time requirement.

ip - Recovery fell outside of control limits. Compounds in the sample matrix interfered with the quantitation of the analyte.

j - The analyte concentration is reported below the lowest calibration standard. The value reported is an estimate.

J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The laboratory control sample(s) percent recovery and/or RPD were out of control limits. The reported concentration should be considered an estimate.

js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

lc - The presence of the analyte is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc - The sample was received with incorrect preservation or in a container not approved by the method. The value reported should be considered an estimate.

ve - The analyte response exceeded the valid instrument calibration range. The value reported is an estimate.

vo - The value reported fell outside the control limits established for this analyte.

x - The sample chromatographic pattern does not resemble the fuel standard used for quantitation.

603536

SAMPLE CHAIN OF CUSTODY

ME 3/30/16

E04

Page # 1 of 1

Send Report To [redacted]

Company Floyd/Snider

Address 601 Union Street Ste. 600

City, State, ZIP Seattle, WA 98101

Phone # 206-292-2078 Fax #

SAMPLERS (signature)

PROJECT NAME/NO. PSTL-Longview

PO#

REMARKS No Silica Gel

TURNAROUND TIME
- [x] Standard (2 Weeks)
- [ ] RUSH
- Rush charges authorized by

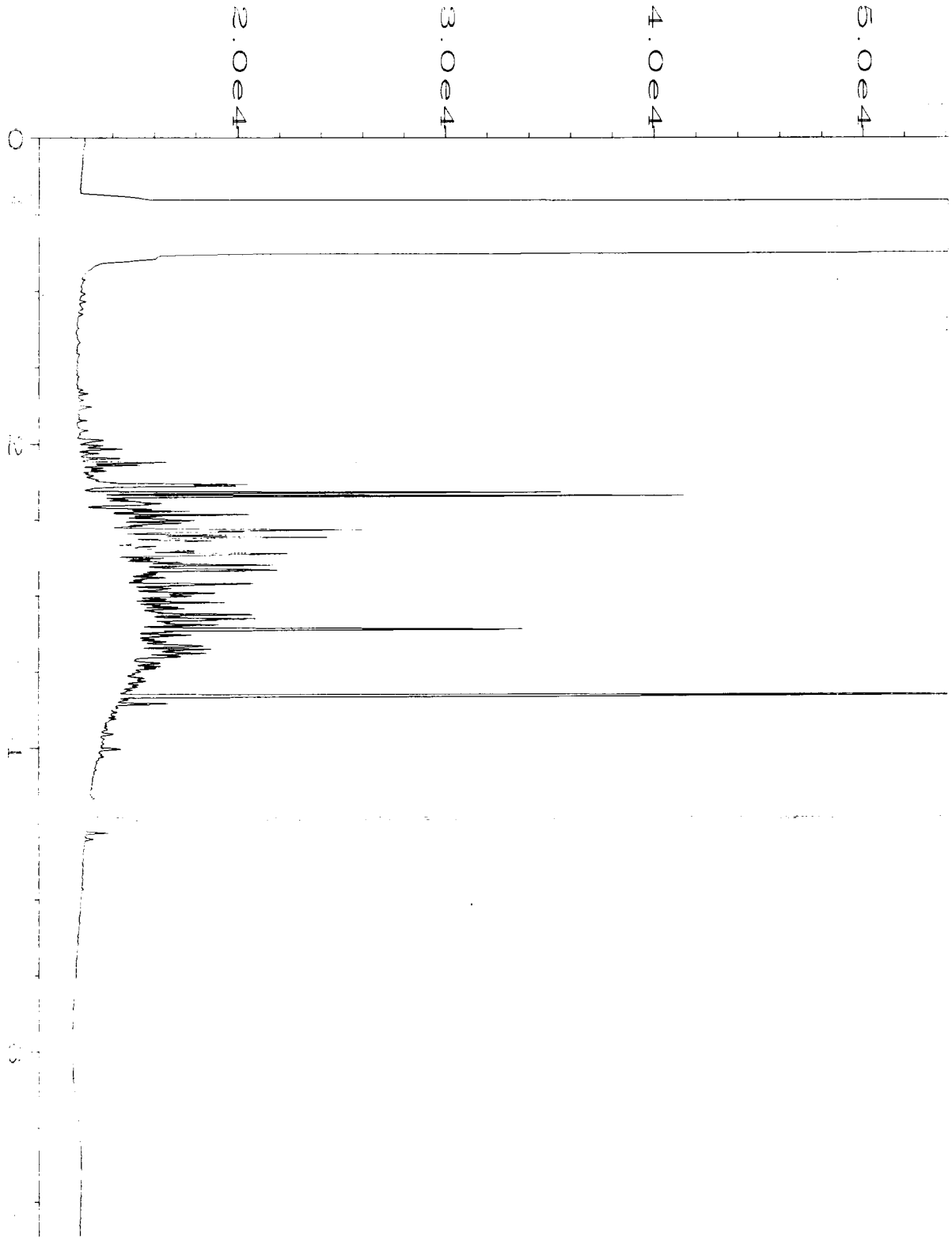
SAMPLE DISPOSAL
- [ ] Dispose after 30 days
- [ ] Return samples
- [ ] Will call with instructions

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of containers	TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by8260	SVOCs by 8270	HFS						Notes
						ANALYSES REQUESTED											
MW-1-GW-4-14	01	3/30/16	1005	W	1	X											
MW-13-GW-4-14	02		1020	W	1	X											Dup
~~MW-3~~ MW-2-GW-4-14	03A-C		1035	W	3	X											MS/MSD
MW-3-GW-4-14	04		1105	W	1	X											
MW-4-GW-4-14	05	↓	1135	W	1	X											

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by:	Gabriel Cisneros	Floyd/Snider	3/30/16	1400
Received by:	Nham Phan	FEBI	3/30/16	1400
Relinquished by:				
Received by:		Samples received at 4 °C		

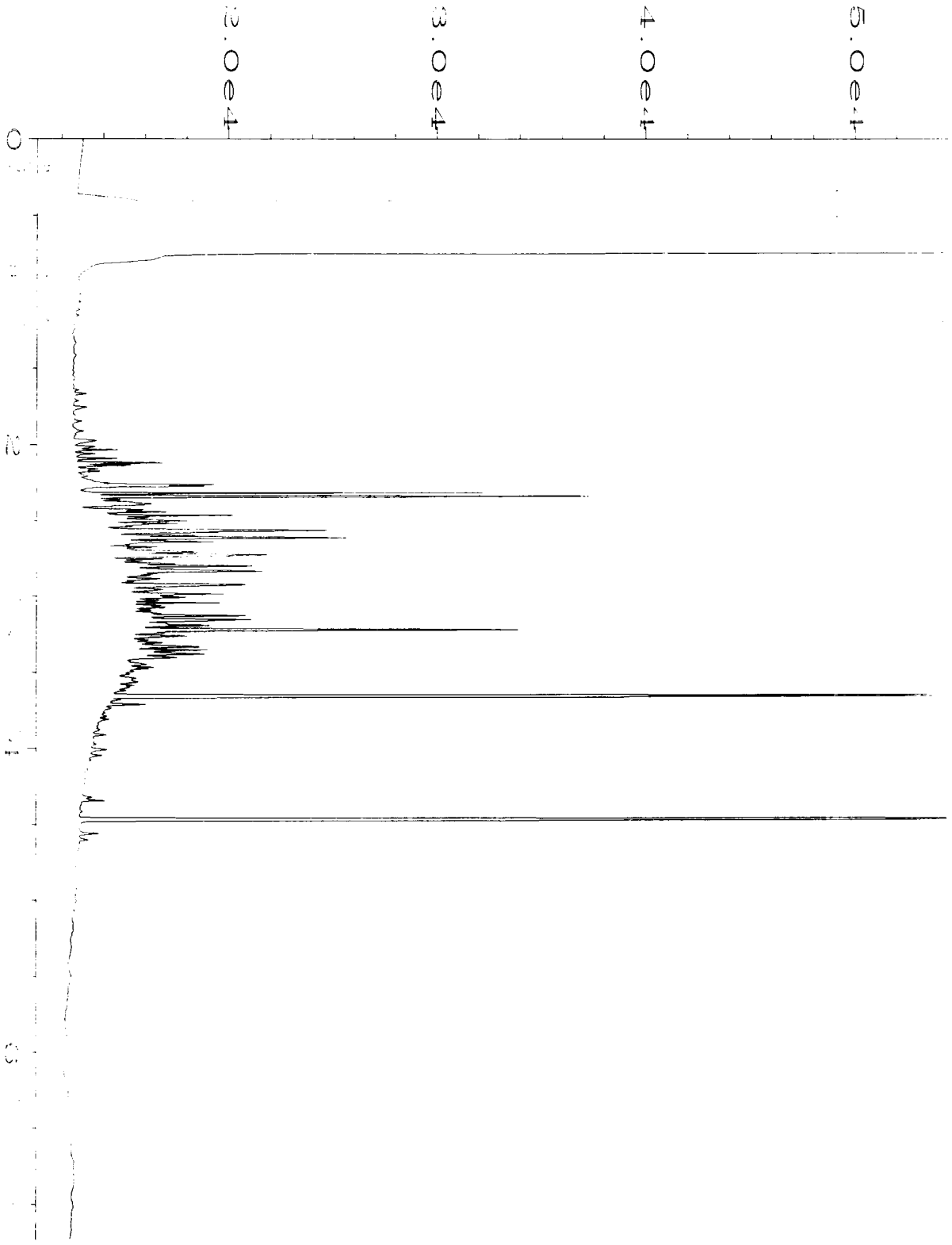
Friedman & Bruya, Inc.
3012 16th Avenue West
Seattle, WA 98119-2029
Ph. (206) 285-8282
Fax (206) 283-5044

FORMS\COC\COC.DOC



Data File Name : C:\HPCHEM\1\DATA\03-31-16\027F0501.D
Operator : mwdl
Instrument : GC1
Sample Name : 603536-01
Run Time Bar Code:
Acquired on : 31 Mar 16 02:43 PM
Report Created on: 02 May 16 01:54 PM

Page Number : 1
Vial Number : 27
Injection Number : 1
Sequence Line : 5
Instrument Method: DX.MTH
Analysis Method : DX.MTH



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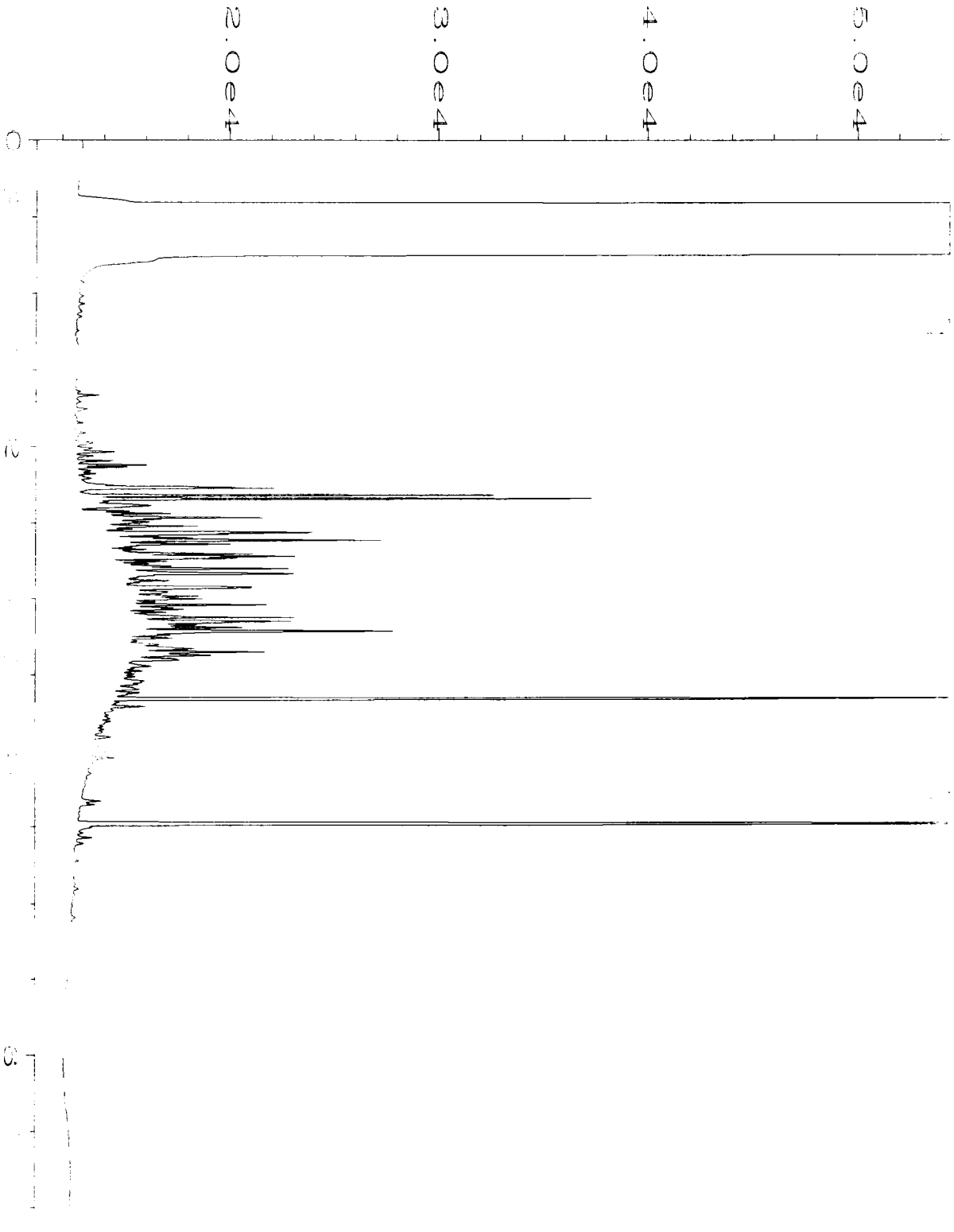
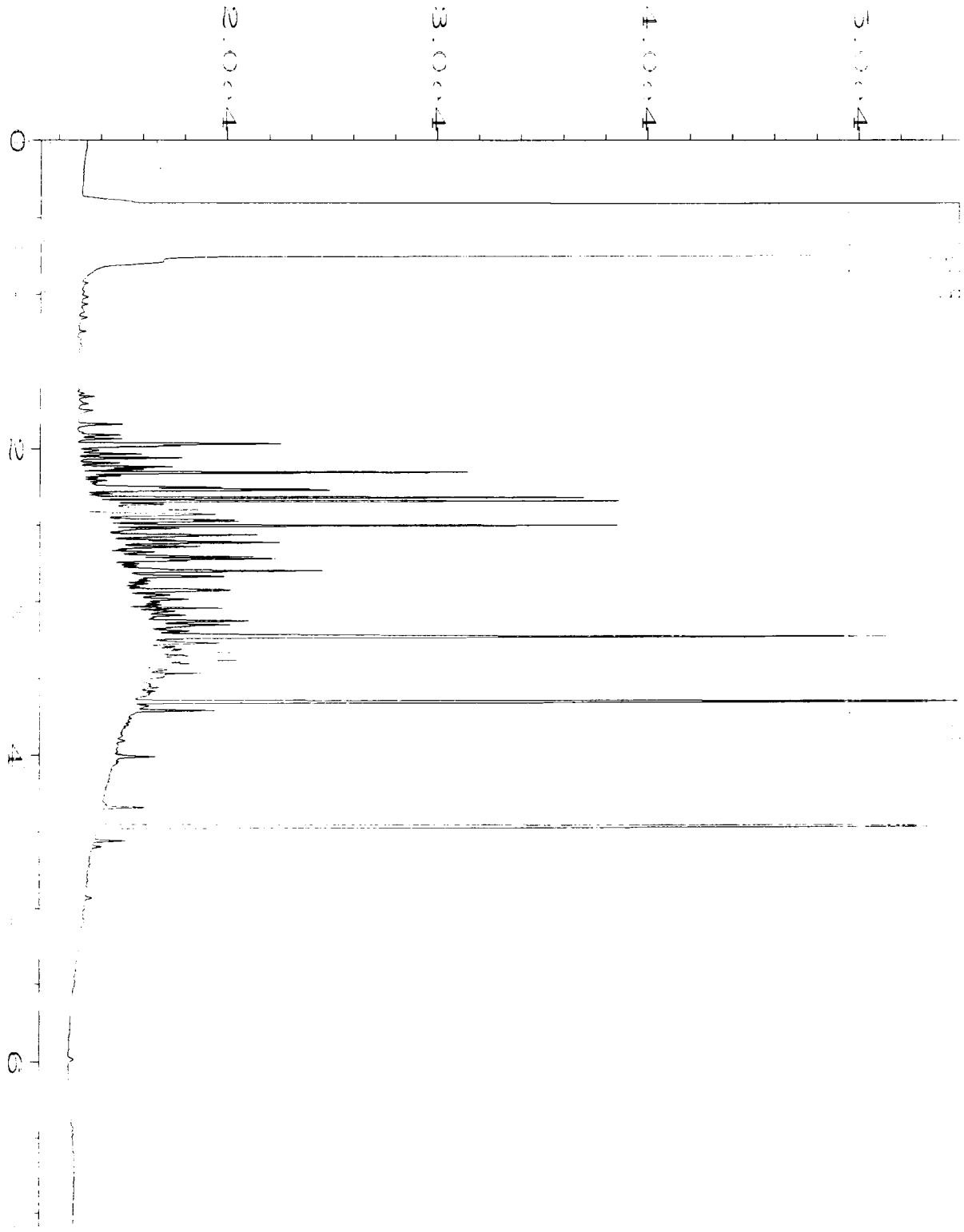
Operator	: mwdl	Page Number	: 1
Instrument	: GC1	Vial Number	: 28
Sample Name	: 603536-02	Injection Number	: 1
Run Time Bar Code:		Sequence Line	: 8
Acquired on	: 31 Mar 16 03:46 PM	Instrument Method	: DX.MTH
Report Created on	: 02 May 16 01:54 PM	Analysis Method	: DX.MTH



Data File Name	: C:\HPCHEM\1\DATA\03-31-16\029F0801.D		
Operator	: mwdl	Page Number	: 1
Instrument	: GC1	Vial Number	: 29
Sample Name	: 603536-03	Injection Number	: 1
Run Time Bar Code:		Sequence Line	: 8
Acquired on	: 31 Mar 16 03:57 PM	Instrument Method	: DX.MTH
Report Created on	: 02 May 16 01:54 PM	Analysis Method	: DX.MTH



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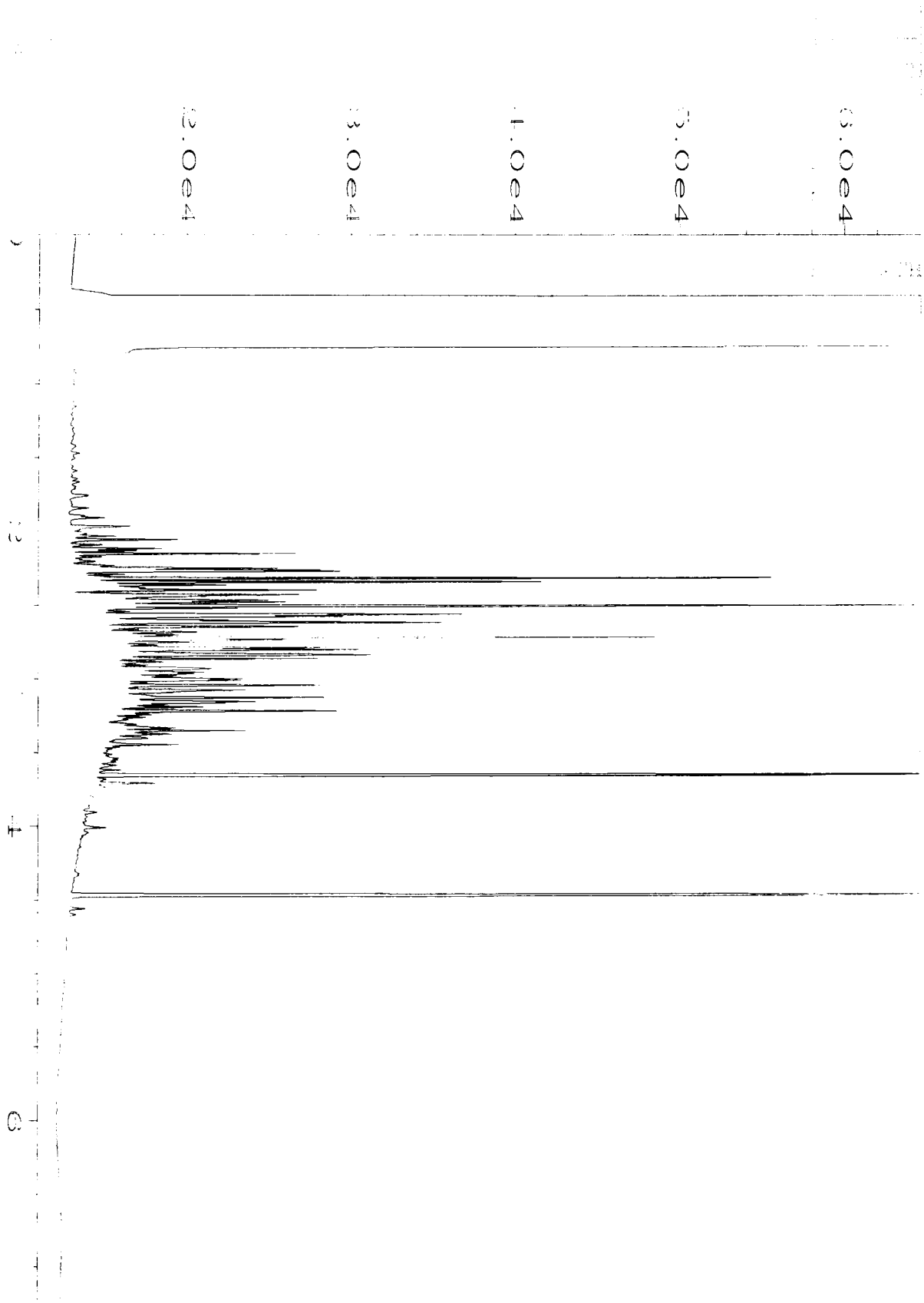
Operator	: mwdl	Page Number	: 1
Instrument	: GC1	Vial Number	: 32
Sample Name	: 603536-04	Injection Number	: 1
Run Time Bar Code:		Sequence Line	: 8
Acquired on	: 31 Mar 16 04:31 PM	Instrument Method	: DX.MTH
Report Created on	: 02 May 16 01:55 PM	Analysis Method	: DX.MTH



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Sample Name	: 603536-05	Injection Number	: 1
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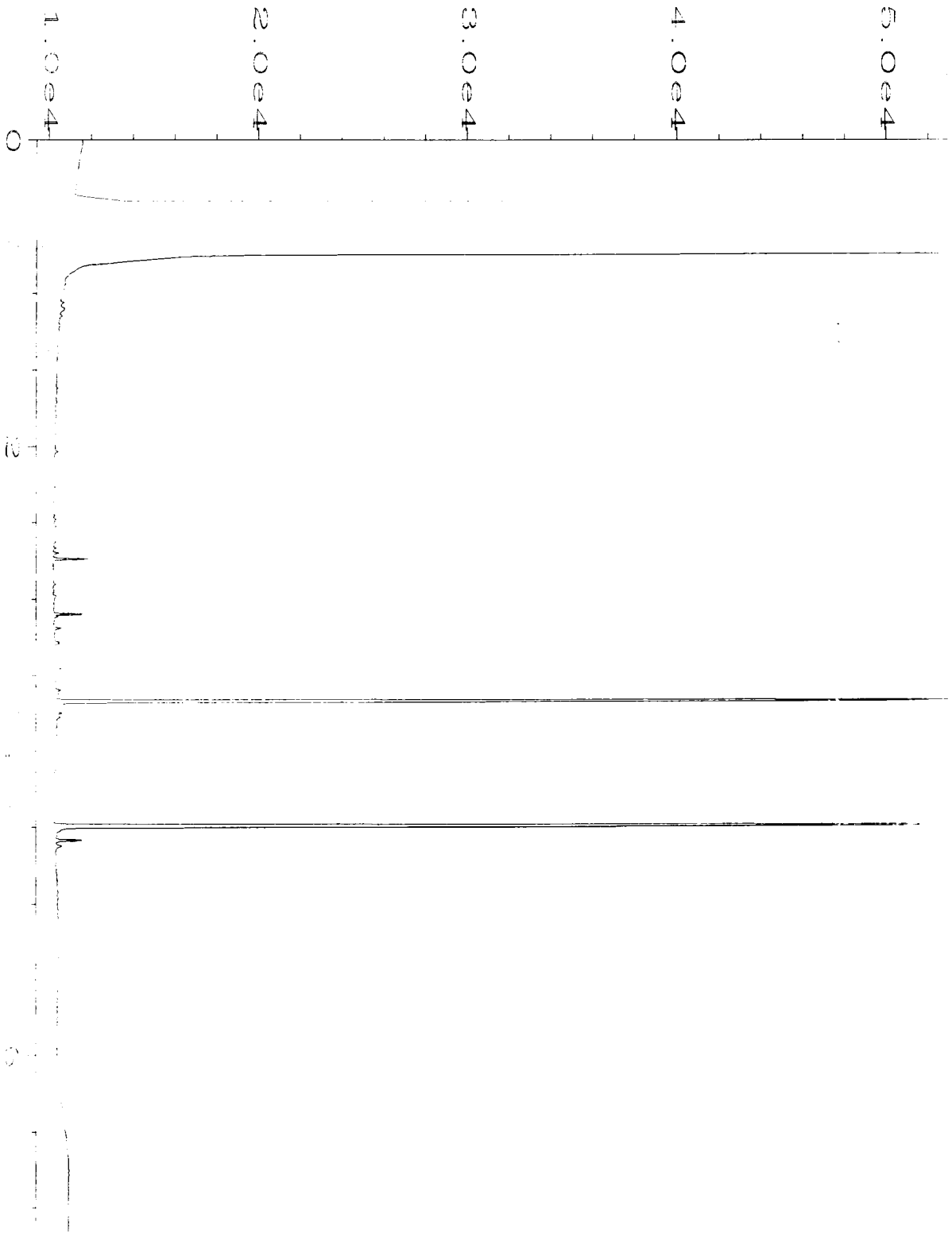
Report Created on	: 02 May 16 01:55 PM	Analysis Method	: DX.MTH



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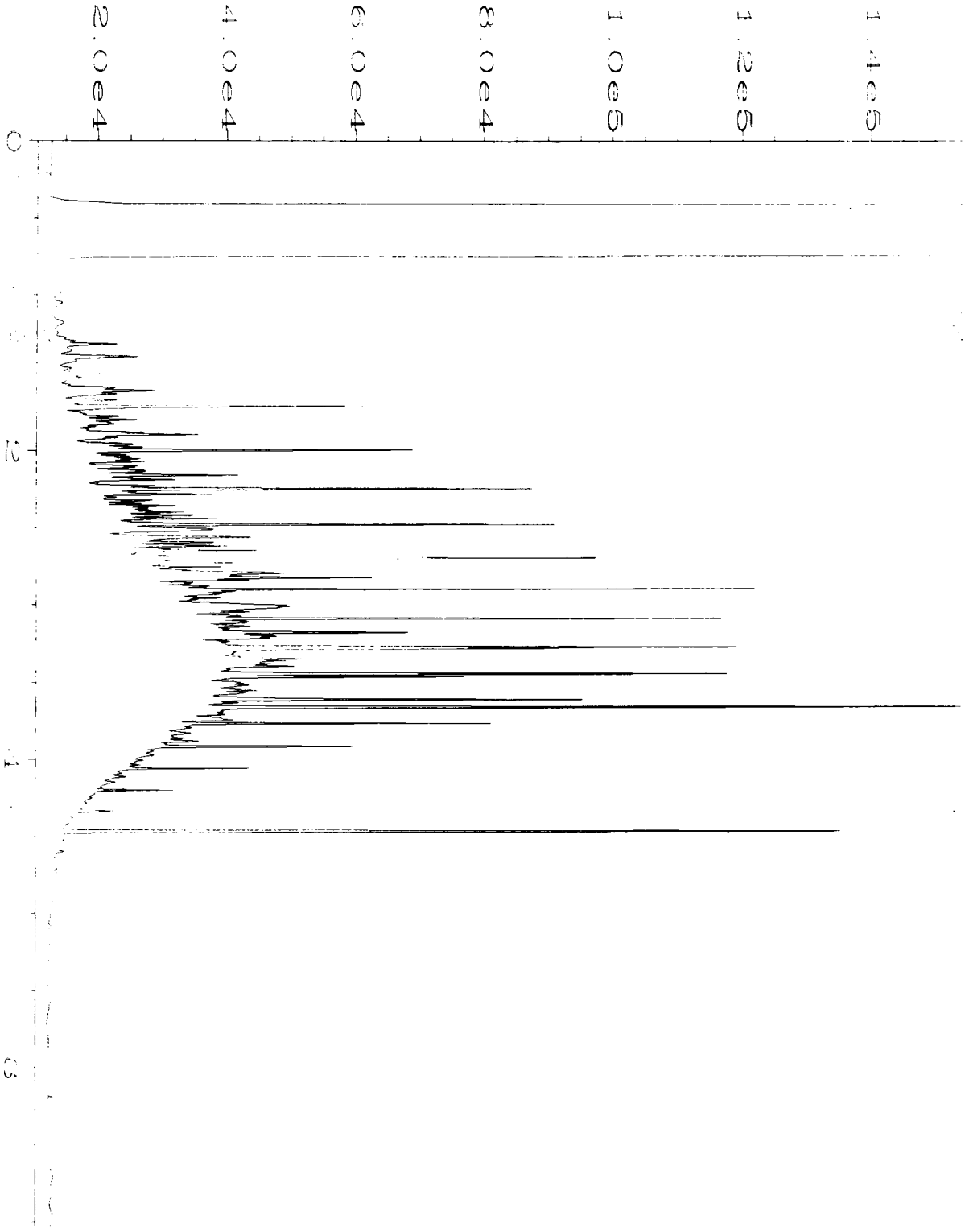
Instrument	: GC1	Vial Number	: 23
Sample Name	: 06-620 mb	Injection Number	: 1
Run Time Bar Code:		Sequence Line	: 5
Acquired on	: 31 Mar 16 02:01 PM	Instrument Method	: DX.MTH
Report Created on	: 02 May 16 01:56 PM	Analysis Method	: DX.MTH



Data File Name	: C:\HPCHEM\1\DATA\03-31-16\003F0201.D		
Operator	: mwdl	Page Number	: 1
Instrument	: GC1	Vial Number	: 3
Sample Name	: 500 Dx 45-182D	Injection Number	: 1
Run Time Bar Code:		Sequence Line	: 2
Acquired on	: 31 Mar 16 07:57 AM	Instrument Method	: DX.MTH
Report Created on	: 02 May 16 01:57 PM	Analysis Method	: DX.MTH

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
Yelena Aravkina, M.S.
Michael Erdahl, B.S.
Arina Podnozova, B.S.
Eric Young, B.S.

3012 16th Avenue West
Seattle, WA 98119-2029
(206) 285-8282
fbi@isomedia.com
www.friedmanandbruya.com

June 30, 2016

Brett Beaulieu, Project Manager
Floyd-Snider
Two Union Square, Suite 600
601 Union St
Seattle, WA 98101

Dear Mr Beaulieu:

Included are the results from the testing of material submitted on June 24, 2016 from the PSTL-Longview, F&BI 606442 project. There are 4 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

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

Sincerely,

FRIEDMAN & BRUYA, INC.

Michael Erdahl
Project Manager

Enclosures
FDS0630R.DOC

CASE NARRATIVE

This case narrative encompasses samples received on June 24, 2016 by Friedman & Bruya, Inc. from the Floyd-Snider PSTL-Longview, F&BI 606442 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Floyd-Snider
606442 -01	MW-3-GW-6-23
606442 -02	MW-1-GW-6-23
606442 -03	MW-4-GW-6-23
606442 -04	MW-2-GW-6-23

All quality control requirements were acceptable.

Date of Report: 06/30/16
Date Received: 06/24/16
Project: PSTL-Longview, F&BI 606442
Date Extracted: 06/24/16
Date Analyzed: 06/24/16

RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL USING METHOD NWTPH-Dx

Results Reported as ug/L (ppb)

Sample ID Laboratory ID	Diesel Range (C_{10}-C_{25})	Surrogate (% Recovery) (Limit 47-140)
MW-3-GW-6-23 606442-01	400	84
MW-1-GW-6-23 606442-02	760	82
MW-4-GW-6-23 606442-03	600	84
MW-2-GW-6-23 606442-04	590	92
Method Blank 06-1285 MB	<50	92

Date of Report: 06/30/16
Date Received: 06/24/16
Project: PSTL-Longview, F&BI 606442

QUALITY ASSURANCE RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL USING METHOD NWTPH-Dx

Laboratory Code: 606442-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Diesel	ug/L (ppb)	2,500	400	106	112	64-141	6

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Diesel	ug/L (ppb)	2,500	109	120	61-133	10

Data Qualifiers & Definitions

a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.

b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.

ca - The calibration results for the analyte were outside of acceptance criteria. The value reported is an estimate.

c - The presence of the analyte may be due to carryover from previous sample injections.

cf - The sample was centrifuged prior to analysis.

d - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.

dv - Insufficient sample volume was available to achieve normal reporting limits.

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

fc - The compound is a common laboratory and field contaminant.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. Variability is attributed to sample inhomogeneity.

hs - Headspace was present in the container used for analysis.

ht – The analysis was performed outside the method or client-specified holding time requirement.

ip - Recovery fell outside of control limits. Compounds in the sample matrix interfered with the quantitation of the analyte.

j - The analyte concentration is reported below the lowest calibration standard. The value reported is an estimate.

J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The laboratory control sample(s) percent recovery and/or RPD were out of control limits. The reported concentration should be considered an estimate.

js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

lc - The presence of the analyte is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

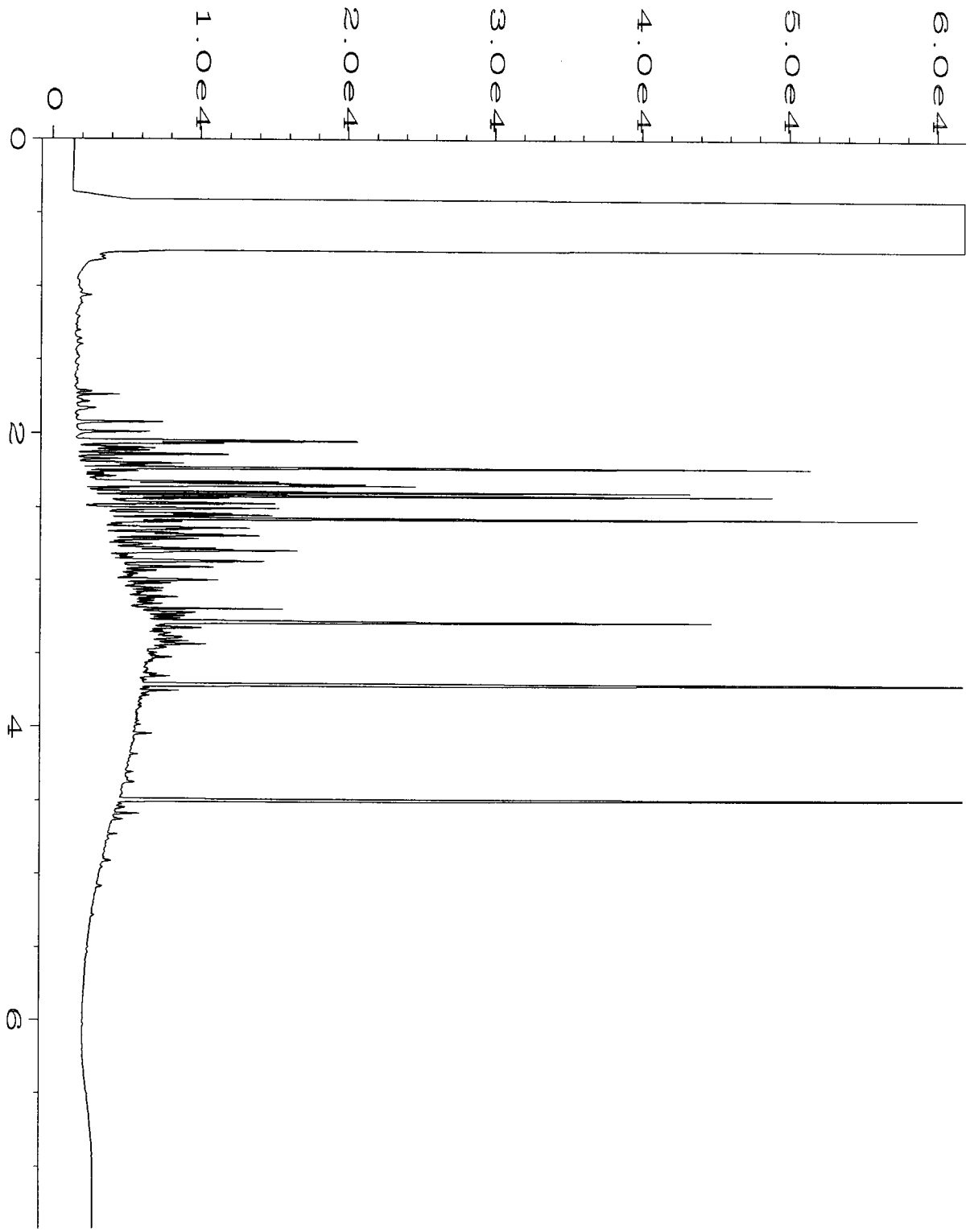
nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc - The sample was received with incorrect preservation or in a container not approved by the method. The value reported should be considered an estimate.

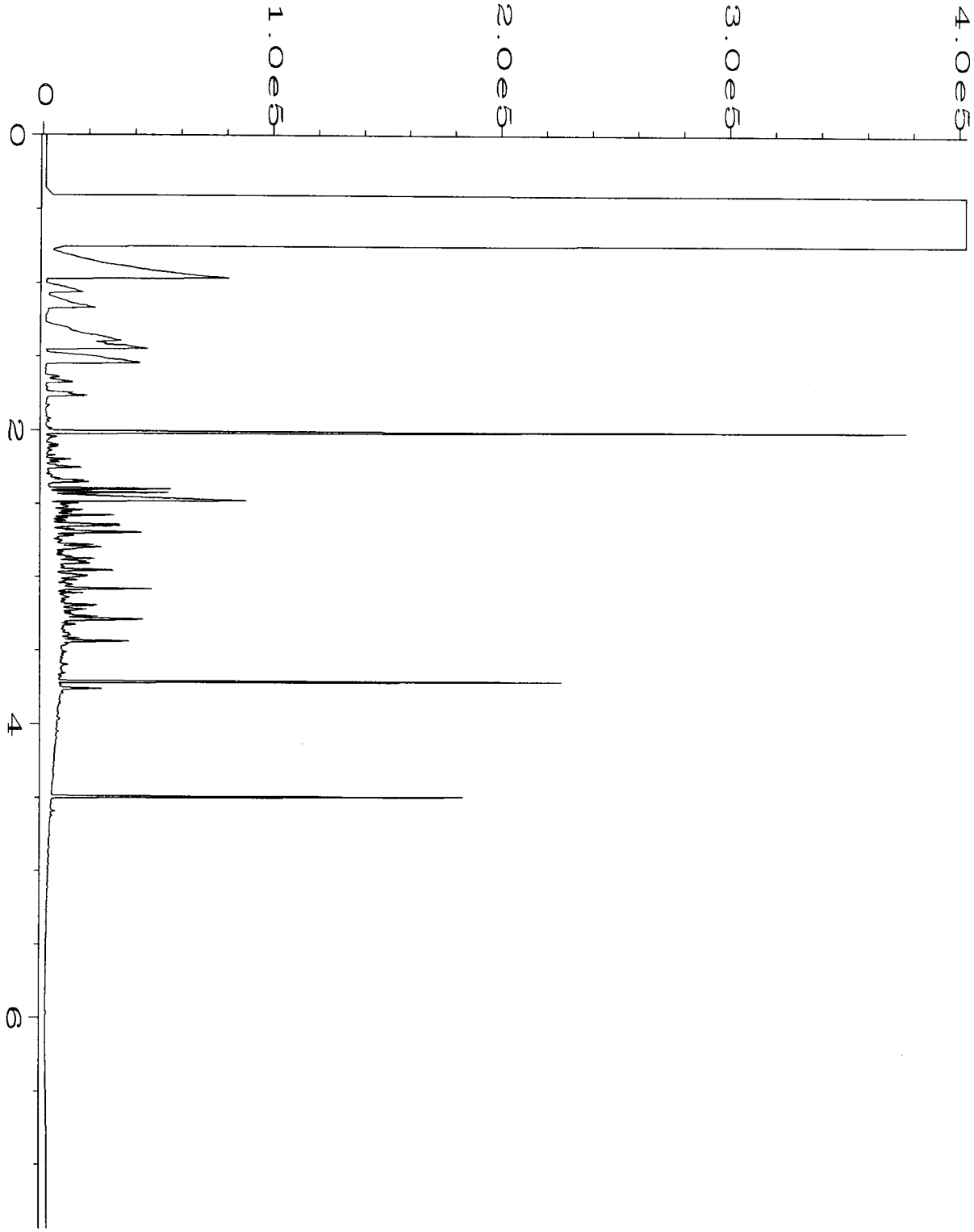
ve - The analyte response exceeded the valid instrument calibration range. The value reported is an estimate.

vo - The value reported fell outside the control limits established for this analyte.

x - The sample chromatographic pattern does not resemble the fuel standard used for quantitation.



Data File Name	: C:\HPCHEM\4\DATA\06-24-16\026F0501.D		
Operator	: mwdl	Page Number	: 1
Instrument	: GC#4	Vial Number	: 26
Sample Name	: 606442-01	Injection Number	: 1
Run Time Bar Code:		Sequence Line	: 5
Acquired on	: 24 Jun 16 04:13 PM	Instrument Method	: DX.MTH
Report Created on	: 29 Jun 16 03:02 PM	Analysis Method	: DX.MTH



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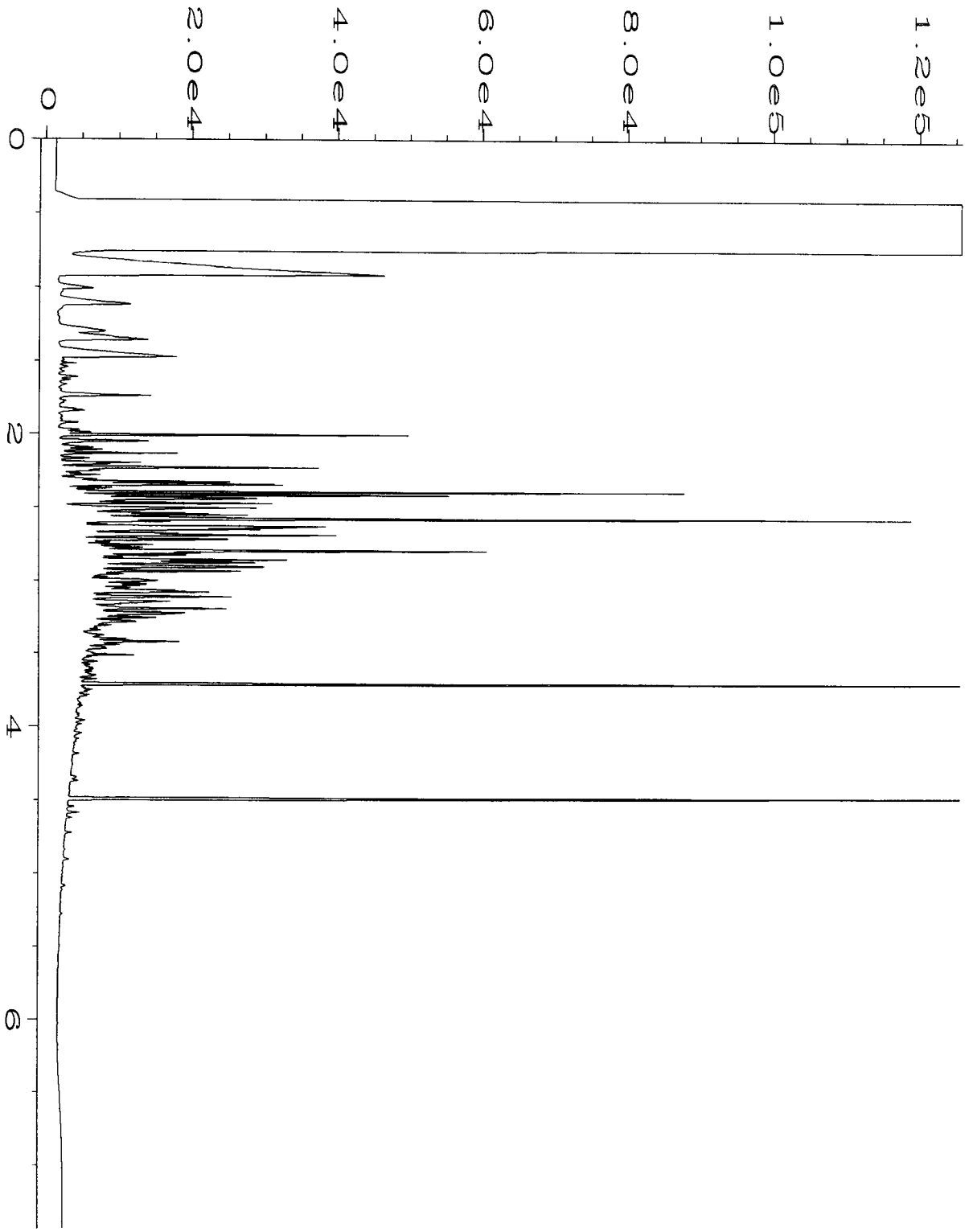
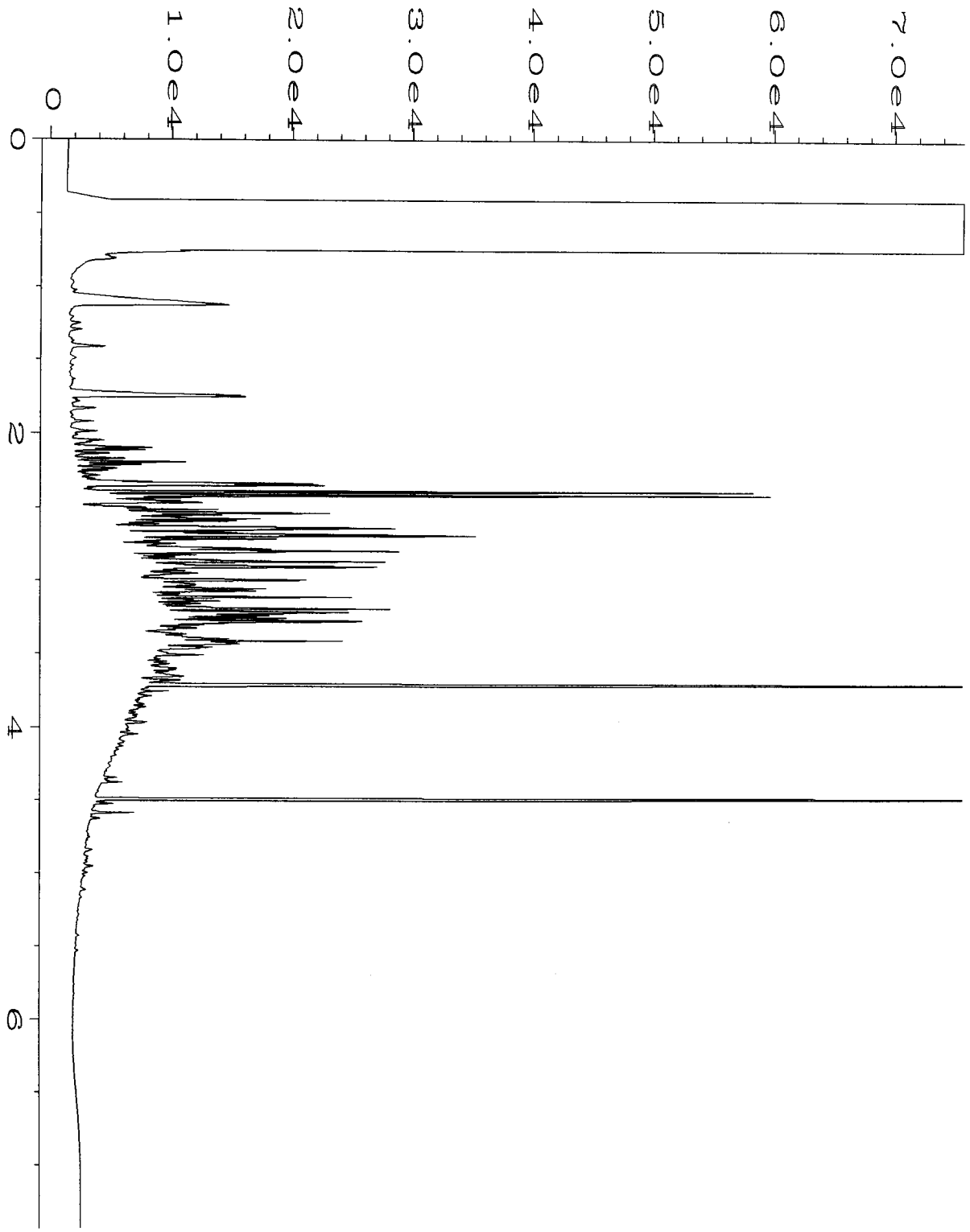
Operator	: mwdl	Page Number	: 1
Instrument	: GC#4	Vial Number	: 29
Sample Name	: 606442-02	Injection Number	: 1
Run Time Bar Code:		Sequence Line	: 5
Acquired on	: 24 Jun 16 04:48 PM	Instrument Method	: DX.MTH
Report Created on	: 29 Jun 16 03:03 PM	Analysis Method	: DX.MTH



Data File Name : C:\HPCHEM\4\DATA\06-24-16\030F0501.D
Operator : mwdl
Instrument : GC#4
Sample Name : 606442-03
Run Time Bar Code:
Acquired on : 24 Jun 16 04:59 PM
Report Created on: 29 Jun 16 03:03 PM

Page Number : 1
Vial Number : 30
Injection Number : 1
Sequence Line : 5
Instrument Method: DX.MTH
Analysis Method : DX.MTH



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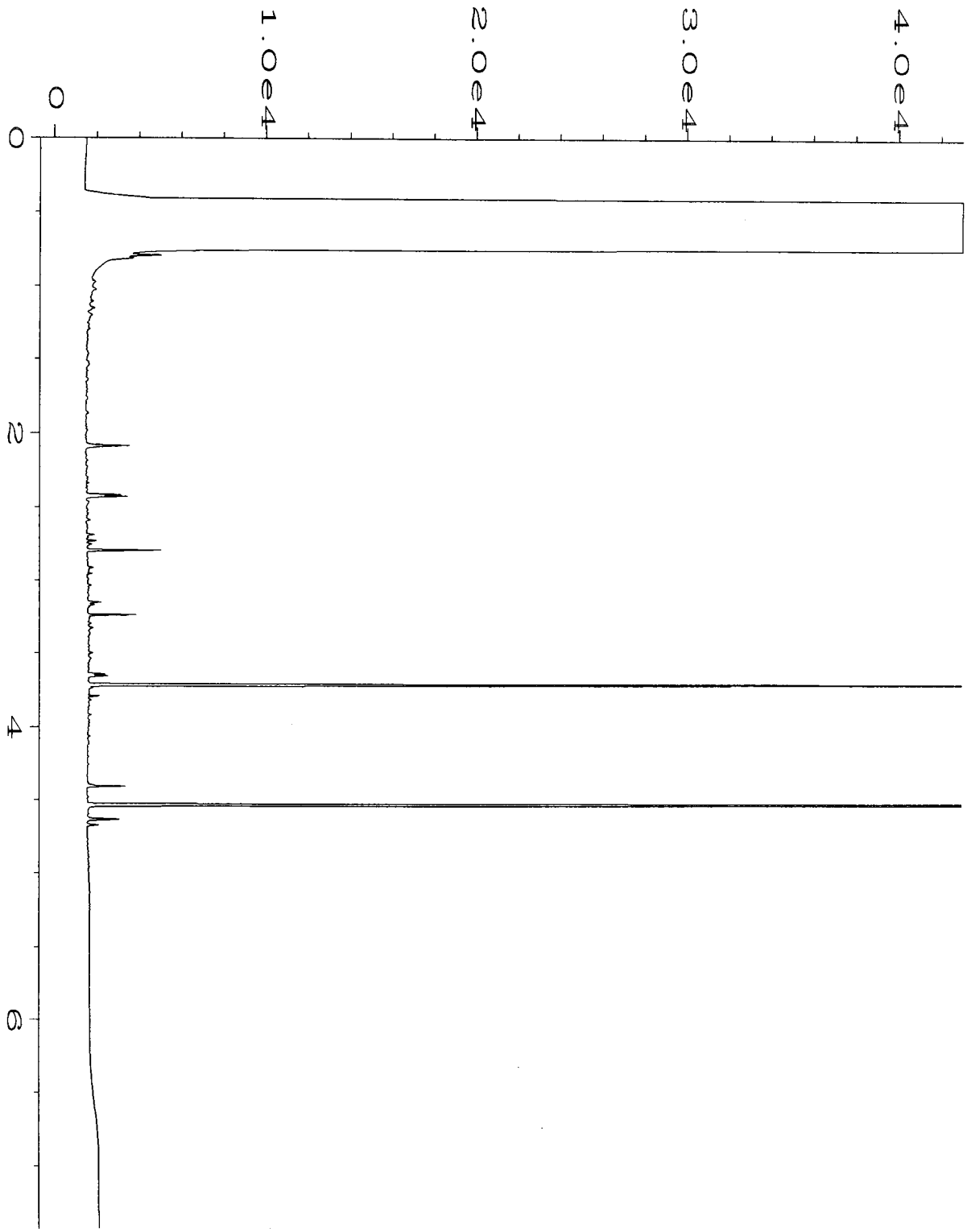
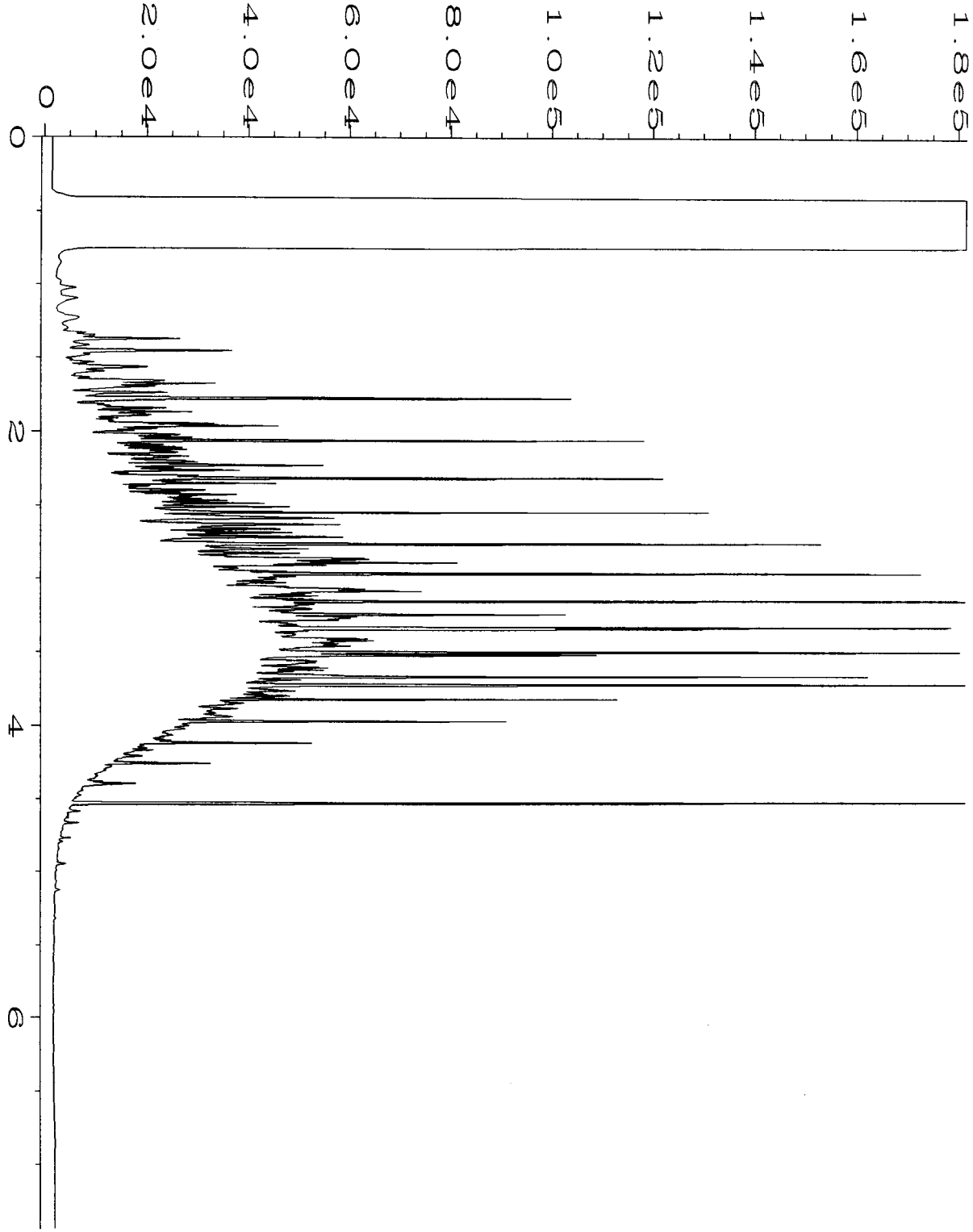
Operator	: mwdl	Page Number	: 1
Instrument	: GC#4	Vial Number	: 31
Sample Name	: 606442-04	Injection Number	: 1
Run Time Bar Code:		Sequence Line	: 5
Acquired on	: 24 Jun 16 05:11 PM	Instrument Method	: DX.MTH
Report Created on	: 29 Jun 16 03:03 PM	Analysis Method	: DX.MTH



Data File Name	: C:\HPCHEM\4\DATA\06-24-16\017F0301.D		
Operator	: mwdl	Page Number	: 1
Instrument	: GC#4	Vial Number	: 17
Sample Name	: 06-1285 mb	Injection Number	: 1
Run Time Bar Code:		Sequence Line	: 3
Acquired on	: 24 Jun 16 02:06 PM	Instrument Method	: DX.MTH
Report Created on	: 29 Jun 16 03:02 PM	Analysis Method	: DX.MTH



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Operator	: mwdl	Page Number	: 1
Instrument	: GC#4	Vial Number	: 3
Sample Name	: 500 Dx 45-182D	Injection Number	: 1
Run Time Bar Code:		Sequence Line	: 2
Acquired on	: 24 Jun 16 06:21 AM	Instrument Method	: DX.MTH
Report Created on	: 29 Jun 16 03:01 PM	Analysis Method	: DX.MTH

606442

SAMPLE CHAIN OF CUSTODY

ME 06/24/16

B05

Report To Brett Beaulieu

Company Floyd Snider

Address 601 Union St., STE 600

City, State, ZIP Seattle WA 98101

Phone 206-2922078 Email

SAMPLERS (*signature*)

PROJECT NAME: PSTL-Longview

PO #

REMARKS

INVOICE TO

Page # of

TURNAROUND TIME
- [x] Standard Turnaround
- [ ] RUSH
- Rush charges authorized by:

SAMPLE DISPOSAL
- [ ] Dispose after 30 days
- [ ] Archive Samples
- [ ] Other

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of Jars	TPH-HCID	TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by 8260C	SVOCs by 8270D	PAHs 8270D SIM					Notes
						ANALYSES REQUESTED											
MW-3-GW-6-23	01 A-C	6/23/16	945	W	3		X										
MW-1-GW-6-23	02 A-B		1048	W	2		X										
MW-4-GW-6-23	03		1213	W	2		X										
MW-2-GW-6-23	04		1450	W	2		X										

Samples received at 2 °C

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by:	William Beaulieu	F/S	06/24	8:15
Received by:		F&B	06/24	8:15
Relinquished by:				
Received by:				

Friedman & Bruya, Inc.
3012 16th Avenue West
Seattle, WA 98119-2029
Ph. (206) 285-8282

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

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September 15, 2016

Brett Beaulieu, Project Manager
Floyd-Snider
Two Union Square, Suite 600
601 Union St
Seattle, WA 98101

Dear Mr Beaulieu:

Included are the results from the testing of material submitted on September 8, 2016 from the PSTL-Longview, F&BI 609132 project. There are 4 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

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

Sincerely,

FRIEDMAN & BRUYA, INC.

Michael Erdahl
Project Manager

Enclosures
FDS0915R.DOC

CASE NARRATIVE

This case narrative encompasses samples received on September 8, 2016 by Friedman & Bruya, Inc. from the Floyd-Snider PSTL-Longview, F&BI 609132 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Floyd-Snider
609132 -01	MW-13-GW-4-14
609132 -02	MW-2-GW-4-14
609132 -03	MW-3-GW-4-14
609132 -04	MW-4-GW-4-14

All quality control requirements were acceptable.

Date of Report: 09/15/16
Date Received: 09/08/16
Project: PSTL-Longview, F&BI 609132
Date Extracted: 09/09/16
Date Analyzed: 09/09/16

RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL USING METHOD NWTPH-Dx

Results Reported as ug/L (ppb)

Sample ID Laboratory ID	Diesel Range (C_{10}-C_{25})	Surrogate (% Recovery) (Limit 47-140)
MW-13-GW-4-14 609132-01	380	100
MW-2-GW-4-14 609132-02	440	98
MW-3-GW-4-14 609132-03	400	103
MW-4-GW-4-14 609132-04	510	100
Method Blank 06-1872 MB	<50	95

Date of Report: 09/15/16
Date Received: 09/08/16
Project: PSTL-Longview, F&BI 609132

QUALITY ASSURANCE RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL USING METHOD NWTPH-Dx

Laboratory Code: 609132-04 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Diesel	ug/L (ppb)	2,500	510	94	96	64-141	2

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Diesel	ug/L (ppb)	2,500	99	94	61-133	5

Data Qualifiers & Definitions

a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.

b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.

ca - The calibration results for the analyte were outside of acceptance criteria. The value reported is an estimate.

c - The presence of the analyte may be due to carryover from previous sample injections.

cf - The sample was centrifuged prior to analysis.

d - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.

dv - Insufficient sample volume was available to achieve normal reporting limits.

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

fc - The compound is a common laboratory and field contaminant.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. Variability is attributed to sample inhomogeneity.

hs - Headspace was present in the container used for analysis.

ht – The analysis was performed outside the method or client-specified holding time requirement.

ip - Recovery fell outside of control limits. Compounds in the sample matrix interfered with the quantitation of the analyte.

j - The analyte concentration is reported below the lowest calibration standard. The value reported is an estimate.

J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The laboratory control sample(s) percent recovery and/or RPD were out of control limits. The reported concentration should be considered an estimate.

js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

lc - The presence of the analyte is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

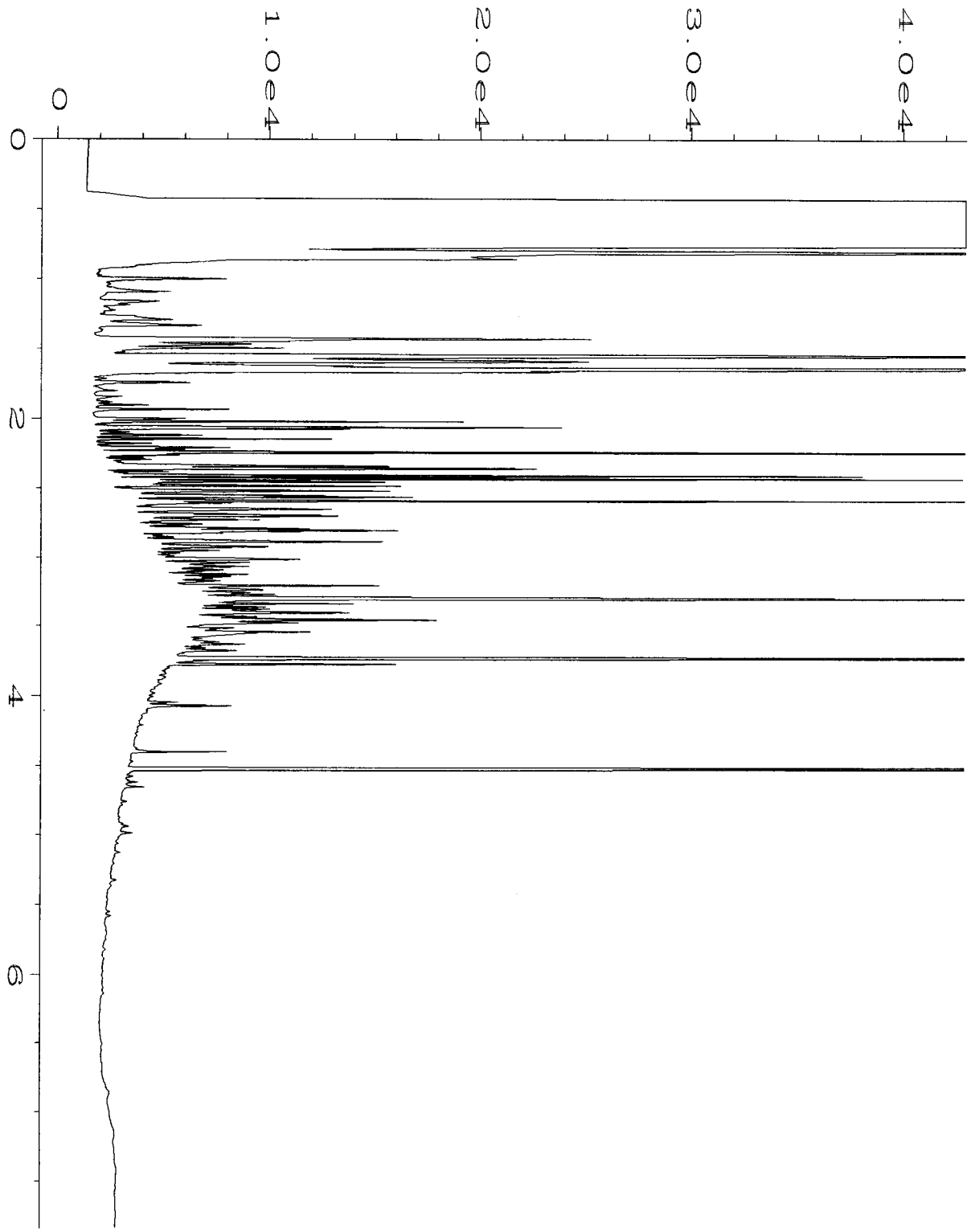
nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc - The sample was received with incorrect preservation or in a container not approved by the method. The value reported should be considered an estimate.

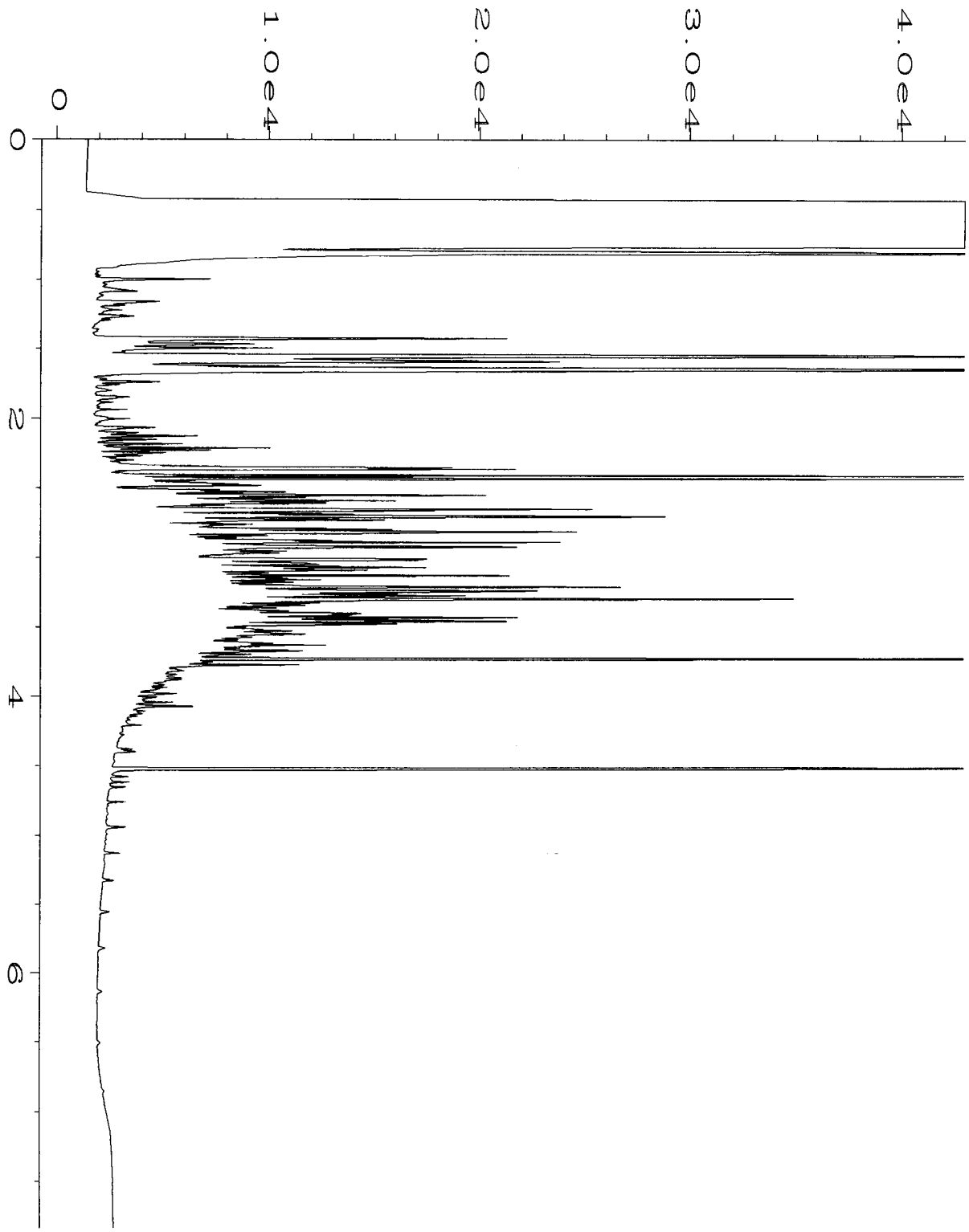
ve - The analyte response exceeded the valid instrument calibration range. The value reported is an estimate.

vo - The value reported fell outside the control limits established for this analyte.

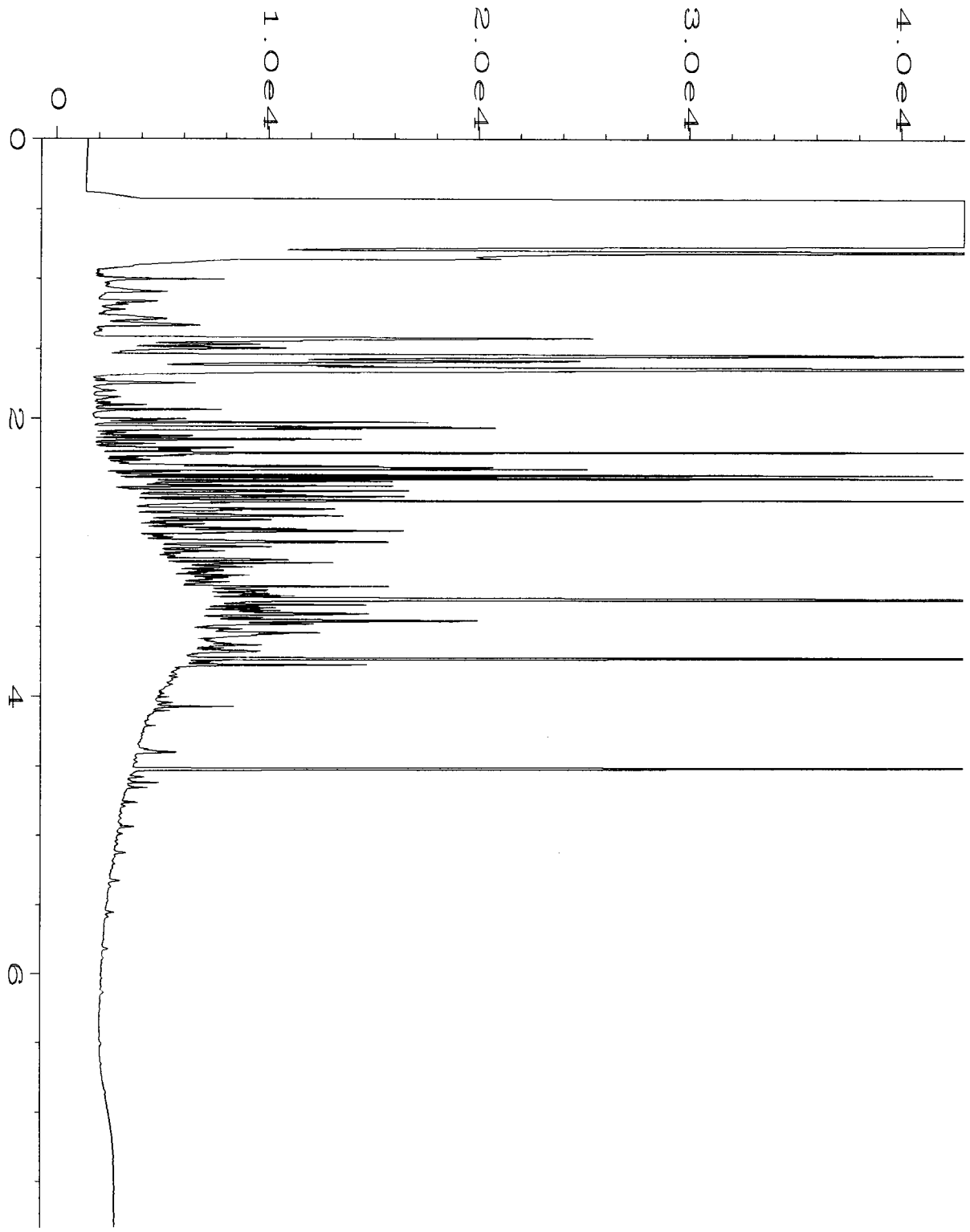
x - The sample chromatographic pattern does not resemble the fuel standard used for quantitation.



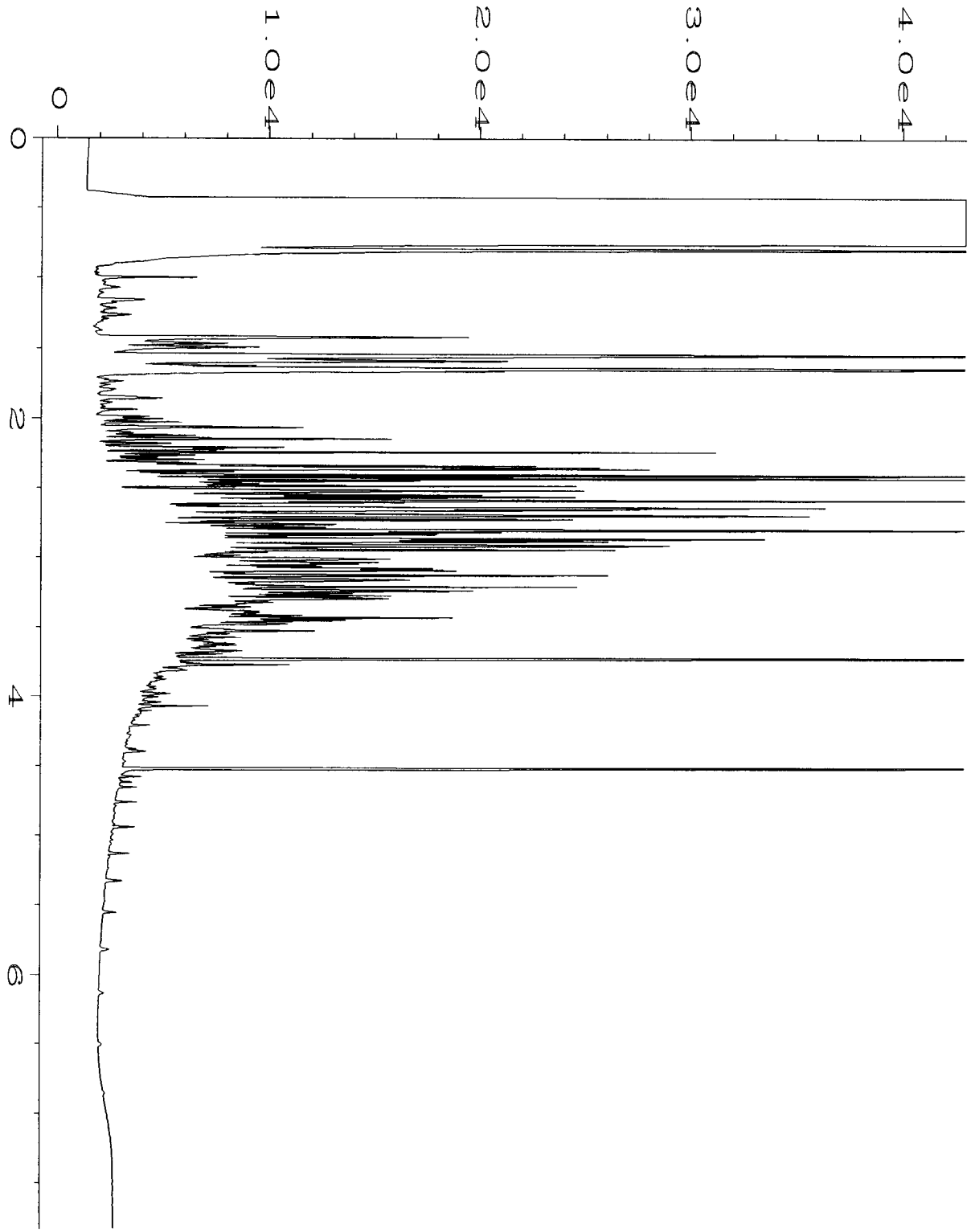
Data File Name	: C:\HPCHEM\4\DATA\09-09-16\045F0901.D		
Operator	: mwdl	Page Number	: 1
Instrument	: GC#4	Vial Number	: 45
Sample Name	: 609132-01	Injection Number	: 1
Run Time Bar Code:		Sequence Line	: 9
Acquired on	: 09 Sep 16 05:55 PM	Instrument Method	: DX.MTH
Report Created on	: 12 Sep 16 09:32 AM	Analysis Method	: DX.MTH



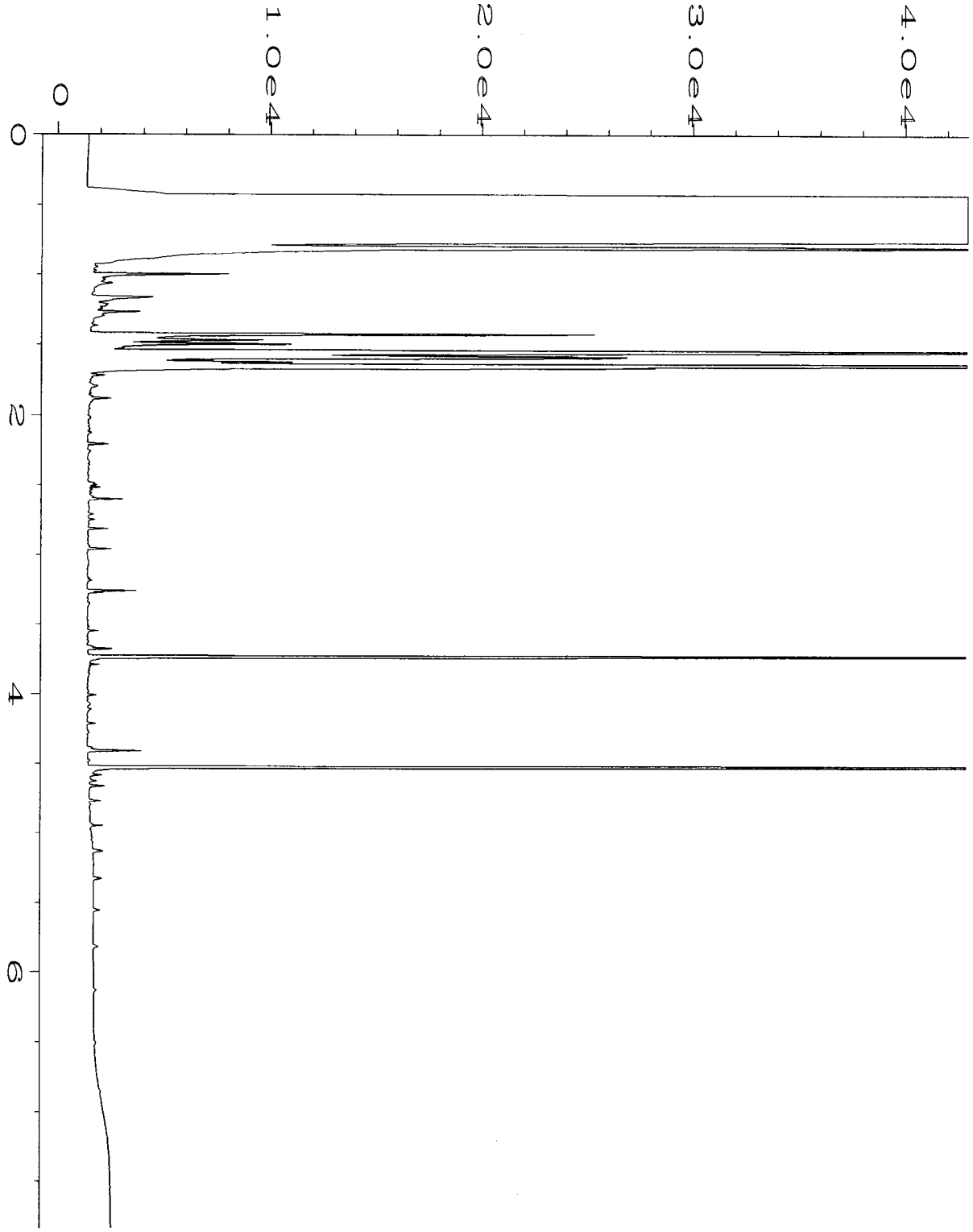
Data File Name	: C:\HPCHEM\4\DATA\09-09-16\046F0901.D		
Operator	: mwdl	Page Number	: 1
Instrument	: GC#4	Vial Number	: 46
Sample Name	: 609132-02	Injection Number	: 1
Run Time Bar Code:		Sequence Line	: 9
Acquired on	: 09 Sep 16 06:07 PM	Instrument Method	: DX.MTH
Report Created on	: 12 Sep 16 09:32 AM	Analysis Method	: DX.MTH



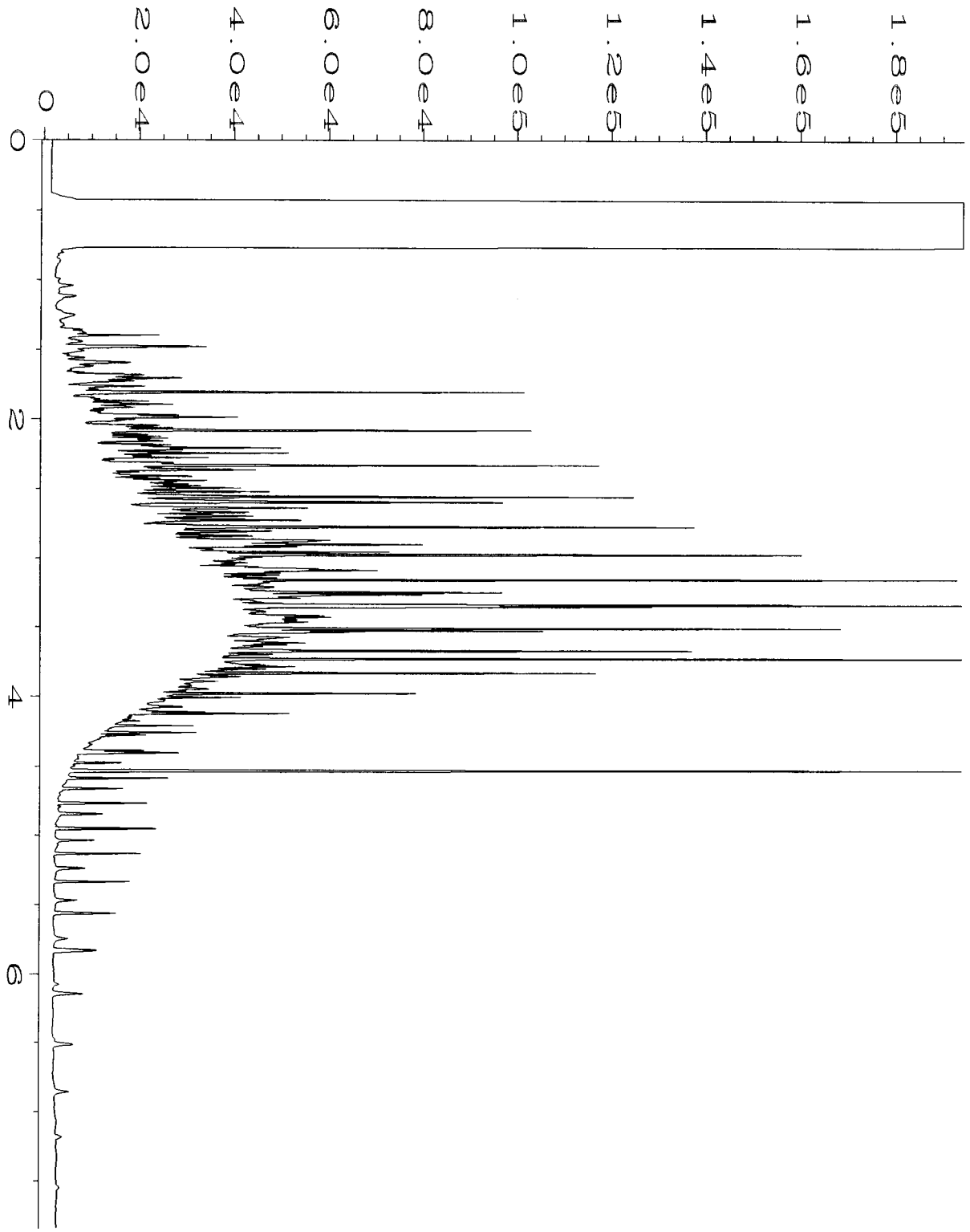
Data File Name	: C:\HPCHEM\4\DATA\09-09-16\047F0901.D		
Operator	: mwdl	Page Number	: 1
Instrument	: GC#4	Vial Number	: 47
Sample Name	: 609132-03	Injection Number	: 1
Run Time Bar Code:		Sequence Line	: 9
Acquired on	: 09 Sep 16 06:19 PM	Instrument Method	: DX.MTH
Report Created on	: 12 Sep 16 09:32 AM	Analysis Method	: DX.MTH



Data File Name	: C:\HPCHEM\4\DATA\09-09-16\048F0901.D		
Operator	: mwdl	Page Number	: 1
Instrument	: GC#4	Vial Number	: 48
Sample Name	: 609132-04	Injection Number	: 1
Run Time Bar Code:		Sequence Line	: 9
Acquired on	: 09 Sep 16 06:31 PM	Instrument Method	: DX.MTH
Report Created on	: 12 Sep 16 09:32 AM	Analysis Method	: DX.MTH



Data File Name	: C:\HPCHEM\4\DATA\09-09-16\042F0701.D		
Operator	: mwdl	Page Number	: 1
Instrument	: GC#4	Vial Number	: 42
Sample Name	: 06-1872 mb	Injection Number	: 1
Run Time Bar Code:		Sequence Line	: 7
Acquired on	: 09 Sep 16 04:54 PM	Instrument Method	: DX.MTH
Report Created on	: 12 Sep 16 09:31 AM	Analysis Method	: DX.MTH



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Operator	: mwdl	Page Number	: 1
Instrument	: GC#4	Vial Number	: 3
Sample Name	: 500 Dx 48-20B	Injection Number	: 1
Run Time Bar Code:		Sequence Line	: 2
Acquired on	: 09 Sep 16 07:20 AM	Instrument Method	: DX.MTH
Report Created on	: 12 Sep 16 09:31 AM	Analysis Method	: DX.MTH

609132

SAMPLE CHAIN OF CUSTODY ME 9/8/16 1303

Report To Bret Bowlen
Company Floyd/Snider
Address 601 Union Street Ste 600
City, State, ZIP Seattle WA 98101
Phone 206-292-2078 Email

SAMPLERS (signature)
PROJECT NAME PSTL-Longview
PO #
REMARKS No Silica Gel
INVOICE TO

Page # of
TURNAROUND TIME
☐ Standard Turnaround
☐ RUSH
Rush charges authorized by

SAMPLE DISPOSAL
☐ Dispose after 30 days
☐ Archive Samples
☐ Other

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of Jars	TPH-HCID	TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by 8260C	SVOCs by 8270D	PAHs 8270D SIM					Notes
~~MW-1-GW-4-14~~ (WB)																	
MW-13-GW-4-14	01	9.8.16	1139	W	1		X										
MW-2-GW-4-14	02	9.8.16	1030	W	1		X										
MW-3-GW-4-14	03	9.8.16	1135	W	1		X										
MW-4-GW-4-14	04A-C	9.8.16	1220	W	3		X										MSD
																	6

ANALYSES REQUESTED

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by:	William Bowlen	Floyd/Snider	9.8.16	322
Received by:	Nhan Phan	FBI	9-8-16	3:22 pm
Relinquished by:				
Received by:				

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