

RECEIVED

JUN 03 2015

WA State Department
of Ecology (SWRO)

ANNUAL GROUNDWATER MONITORING REPORT: 2014

**Progress Rail Spill Incident # 12-0773
4012 SR 509 South Frontage Road
Tacoma, Pierce County, Washington**

January 23, 2015
Project No. 81127060

Prepared for:
Progress Rail Services
Tacoma, Washington

Prepared by:
Terracon Consultants, Inc.
21905 64th Avenue, Suite 100
Mountlake Terrace, WA 98042

Offices Nationwide
Employee-Owned

Established in 1965
terracon.com

Terracon

Geotechnical ■ **Environmental** ■ **Construction Materials** ■ **Facilities**



January 23, 2015

Progress Rail Services
4012 SR 509 South Frontage Road
Tacoma, Washington 98421

Attn: Tannia Girouard

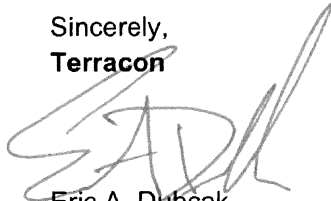
Re: Annual Groundwater Monitoring Report – 2014
Progress Rail Spill Incident # 12-0773
4012 SR 509 South Frontage Road
Tacoma, Pierce County, Washington
Terracon Project No. 81127060

Dear Ms. Girouard:

Terracon is pleased to submit this Annual Groundwater Monitoring Report for the above referenced site. This investigation was performed in general accordance with Terracon Proposal No. P81140021 dated January 31, 2014 and the terms, conditions and limitations in the Environmental Consulting Agreement between Terracon Consultants, Inc. and Progress Rail Corporation, dated June 12, 2013.

We appreciate the opportunity to perform these services for Progress Rail Services. Please contact either of the undersigned at 425-771-3304 if you have questions regarding the information provided in the report.

Sincerely,
Terracon



Eric A. Dubcak
Project Manager



Matt Wheaton, E.I.T., L.G.
Department Manager

TABLE OF CONTENTS

1.0 INTRODUCTION.....	3
1.1 SCOPE OF WORK.....	3
1.2 STANDARD OF CARE.....	3
1.3 ADDITIONAL SCOPE LIMITATIONS.....	4
1.4 RELIANCE.....	4
2.0 PROJECT BACKGROUND.....	5
3.0 GROUNDWATER SAMPLING ACTIVITIES.....	5
3.1 ANALYTICAL LABORATORY TESTING.....	6
3.2 QUALITY ASSURANCE/QUALITY CONTROL RESULTS.....	6
4.0 LABORATORY ANALYTICAL RESULTS.....	7
5.0 FINDINGS AND CONCLUSIONS.....	9
6.0 RECOMMENDATIONS.....	10

FIGURES

Figure 1 - Site Vicinity Map

Figure 2 – Site Diagram

Figure 3 - Groundwater Migration Gradient – February 2014

Figure 4 - Groundwater Migration Gradient – May 2014

Figure 5 - Groundwater Migration Gradient – August 2014

Figure 6 - Groundwater Migration Gradient – November 2014

TABLES

Table 1 – Summary of Depth to Groundwater Measurements

Table 2 – Summary of Groundwater Analytical Results – TPH DX

Table 3 – Summary of Groundwater Analytical Results – BTEX, cPAHs, Naphthalenes

APPENDICES

Analytical Laboratory Reports & Chain-of-Custody Documentation

ANNUAL GROUNDWATER MONITORING REPORT – 2014

Progress Rail Spill Incident # 12-0773

4012 SR 509 South Frontage Road

Tacoma, Pierce County, Washington

Terracon Project No. 81127060

1.0 INTRODUCTION

This groundwater monitoring report documents groundwater sampling activities that were conducted at the Progress Rail site (Site), located at 4012 SR 509 South Frontage Road in Tacoma, Pierce County, Washington in 2014. A Site Vicinity Map is included as Figure 1 that shows the site in relation to the surrounding area. Figure 2 presents the locations of the monitoring wells at the site. Figures 3, 4, 5 and 6 depict the quarterly groundwater migration directions.

1.1 Scope of Work

Terracon Consultants, Inc. (Terracon) conducted four quarterly groundwater monitoring events in general accordance with Terracon Proposal No. P81140021 dated January 31, 2014 and the terms, conditions and limitations in the Environmental Consulting Agreement between Terracon Consultants, Inc. and Progress Rail Corporation, dated June 12, 2013. The sampling event was conducted to further evaluate concentrations of total petroleum hydrocarbons (TPH) in the diesel and oil range, in groundwater at the site. Additionally, as required by WAC 173-340-900, Table 830-1 cleanup regulations require analysis of benzene, toluene, ethylbenzene, and xylenes (BTEX), carcinogenic polycyclic aromatic hydrocarbons (cPAHs) and naphthalenes when characterizing for diesel-range petroleum releases. These chemicals of concern (COCs) were collected and analyzed from all four monitoring wells during the last two sampling events. This report includes a description of the groundwater sample collection activities, tables showing the depth to groundwater measurements, current and historical analytical results, and copies of the 2014 four quarters of analytical laboratory reports with chain-of-custody documentation.

1.2 Standard of Care

Terracon's services were performed in a manner consistent with generally accepted practices of the profession undertaken in similar studies in the same geographical area during the same time period. Please note that Terracon does not warrant the work of laboratories, regulatory agencies or other third parties supplying information used in the preparation of the report. These groundwater monitoring services were performed in

accordance with the scope of work agreed with you, our client, as reflected in our proposal.

1.3 Additional Scope Limitations

This report was intended to reduce, but not eliminate, uncertainty regarding the existence of recognized environmental conditions in connection with the subject site. Findings, conclusions and recommendations resulting from these services are based upon information derived from the on-site activities and other services performed under this scope of work, specifically for the spill documented at the site as Spill Incident 12-0773; such information is subject to change over time. Other areas of the property could be contaminated as well as the site and this evaluation was purely associated with the groundwater quality in the vicinity of this spill. Certain indicators of the presence of hazardous substances, petroleum products, or other constituents may have been latent, inaccessible, unobservable, non-detectable or not present during these services, and we cannot represent that the site contains no hazardous substances, toxic materials, petroleum products, or other latent conditions beyond those identified during these groundwater sampling events. Subsurface conditions may vary from those encountered at the time of construction or at specific borings or wells or during other surveys, tests, assessments, investigations or exploratory services. The data, interpretations, findings, and our recommendations are based solely upon data obtained at the time and within the scope of these services. If, during future site development, different subsurface conditions from those encountered during our explorations are observed or appear to be present, we must be advised promptly so that we can review these conditions and reconsider or modify our conclusions and recommendations where necessary.

1.4 Reliance

This report has been prepared for the exclusive use and reliance of Progress Rail. Use or reliance by any other party is prohibited without the written authorization of Progress Rail and Terracon.

Reliance on this report by the client and all authorized parties will be subject to the terms, conditions and limitations stated in this report and Terracon's agreement for services. The limitation of liability defined in the terms and conditions is the aggregate limit of Terracon's liability to the client and all relying parties unless otherwise agreed in writing.

2.0 PROJECT BACKGROUND

Terracon previously performed a Limited Site Investigation (LSI), a Supplemental Investigation and Remedial Excavation; and Groundwater Monitoring Well Installation and Sampling associated with the March 2012 diesel spill (Incident # 12-0773) as discussed in detail in the following reports:

- *Draft Limited Site Investigation, Progress Rail, 4012 SR 509 South Frontage Road, Tacoma, Pierce County, Washington, dated January 28, 2013;*
- *Supplemental Investigation & Remedial Excavation, Progress Rail Spill Incident #12-0773, 4012 SR 509 South Frontage Road, Tacoma, Pierce County, Washington, dated March 11, 2014; and*
- *Groundwater Monitoring Well Installation and Sampling, Progress Rail Spill Incident #12-0773, 4012 SR 509 South Frontage Road, Tacoma, Pierce County, Washington, dated April 15, 2014.*

As a function of the backfill process of the Supplemental Investigation and Remedial Excavation activities, Terracon applied an enhanced bio-remediation agent (Advanced ORC-A®) to soil in the saturated zone along the length of the excavation area. The enhanced bioremediation enhances the native microbial population through the introduction of oxygen in to the subsurface, which in turn promotes the metabolism of residual petroleum hydrocarbons.

To further assess the extents of the groundwater impacts (identified in prior assessments completed by others), establish the on-site groundwater migration direction, and to monitor the effectiveness of the bio-remediation application, Terracon installed a total of four permanent groundwater monitoring wells and sampled them quarterly to confirm groundwater impacts and identify potential increases or decreases associated with seasonal fluctuations.

3.0 GROUNDWATER SAMPLING ACTIVITIES

Depth to groundwater in each well was measured prior to sample collection is included in Table 1. Due to low recharge in some of the wells, limited sample volumes were collected from some wells.

Prior to sample collection, each monitoring well was purged until consistent values (i.e., less than approximately 10% variance between consecutive readings) were obtained for pH, temperature, dissolved oxygen, oxidation-reduction potential, and conductivity. Low-flow groundwater discharge rates were maintained during sampling in order to minimize the drawdown of the water level in the wells. Following the stabilization of groundwater parameters measured via a flow-through cell, samples were collected utilizing a peristaltic pump and dedicated polyethylene tubing. Discharge from the peristaltic pump was directed into laboratory provided glassware.

Sampling equipment was cleaned using an Alconox[®] wash and potable water prior to the beginning of the project and before collecting each groundwater sample. Each sample container was labeled with the site name, date, time, well number, and sample number.

3.1 Analytical Laboratory Testing

Groundwater samples were delivered Friedman & Bruya, Inc., a Washington accredited analytical laboratory in Seattle, Washington, for laboratory analysis for one or more of the following:

- Diesel-range and oil-range TPH via Northwest Method NWTPH-Dx;
- BTEX via EPA Method 8021B;
- cPAHs via EPA 8270 SIM; and
- Naphthalenes via EPA Method 8270.

The executed chain-of-custody forms and laboratory analytical certificates are provided in Appendix B. All analyses were completed using standard turnaround times.

3.2 Quality Assurance/Quality Control Results

The analytical results for the current investigation were checked for completeness immediately upon receipt from the laboratory to ensure that data and QA/QC information requested were present. Data quality was assessed by considering hold times, surrogate recovery, method blanks, matrix spike and matrix spike duplicate (MS/MSD) recovery, and detection limits. QA/QC review was completed using guidance described in *USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review* (Draft Final, USEPA, 2005). Our evaluation assumes that the QA/QC is correct as reported by the laboratory, and merely provides an interpretation of the QA/QC results.

Hold Times: All analyses were completed within specified hold times.

Surrogate Recoveries: All surrogate recoveries were within laboratory limits.

Method Blanks: Analytes were not detected in any of the laboratory method blanks.

MS/MSD Results: MS and MSD recoveries were all within laboratory limits, and Relative Percent Differences (RPDs) between MS and MSD recoveries were all within laboratory limits.

Laboratory Reporting Limits: Reporting limits were below relevant MTCA cleanup levels.

Several samples were flagged by the laboratory indicating that the sample chromatogram does not resemble the fuel standard used for quantitation. These flagged samples are sometimes associated with organic interference which can be filtered out by initially passing the sample through a silica-gel cleanup prior to extraction. However, none of the samples that were flagged exceeded respective cleanup levels. Based upon our interpretation of quality control information provided by the laboratory, it is our opinion that the overall dataset is useable as qualified for the purposes of this groundwater sampling event.

4.0 LABORATORY ANALYTICAL RESULTS

A summary of analytical results for groundwater quality from the quarterly sampling events is presented in Table 2 and Table 3. The results are tabulated with the state cleanup levels included for comparison. The complete laboratory reports and chain-of-custody forms for analytical results from this sampling event are included in the Appendix. In summary, these are the results of the sampling for each quarter.

February 2014 Monitoring Event

Diesel- and Oil-Range TPH

Diesel and oil-range TPH were not identified above the respective MTCA Method A Cleanup Level of 500 µg/L and/or analytical laboratory detection limits in any of the groundwater samples collected during our February 2014 sampling event.

May 2014 Monitoring Event

Diesel- and Oil-Range TPH

Diesel and oil-range TPH were not identified above the respective MTCA Method A Cleanup Level of 500 µg/L and/or analytical laboratory detection limits in any of the groundwater samples collected during our May 2014 sampling event.

August 2014 Monitoring Event

Diesel- and Oil-Range TPH

Diesel and oil-range TPH were not identified above the respective MTCA Method A Cleanup Level of 500 µg/L and/or analytical laboratory detection limits in any of the groundwater samples collected during our August 2014 sampling event.

BTEX

BTEX constituents were not identified above analytical laboratory detection limits in any of the groundwater samples collected during our August 2014 sampling event.

cPAHs

cPAH constituents (benz(a)anthracene; chrysene, benzo(a)pyrene; benzo(a)fluoranthene; benzo(b)fluoranthene; benzo(k)fluoranthene; indeno(1,2,3-cd)pyrene; and dibenz(a,h)anthracene) were not identified above analytical laboratory detection limits in any of the groundwater samples collected during our August 2014 sampling event.

Naphthalenes

Naphthalenes (naphthalene, 2-methylnaphthalene & 1-methylnaphthalene) were not identified above analytical laboratory detection limits in any of the groundwater samples collected during our August 2014 sampling event.

November 2014 Monitoring Event

Diesel- and Oil-Range TPH

Diesel and oil-range TPH were not identified above the respective MTCA Method A Cleanup Level of 500 µg/L and/or analytical laboratory detection limits in any of the groundwater samples collected during our November 2014 sampling event.

BTEX

BTEX constituents were not identified above analytical laboratory detection limits in any of the groundwater samples collected during our November 2014 sampling event.

cPAHs

cPAH constituents (benz(a)anthracene; chrysene, benzo(a)pyrene; benzo(a)fluoranthene; benzo(b)fluoranthene; benzo(k)fluoranthene; indeno(1,2,3-cd)pyrene; and dibenz(a,h)anthracene) constituents were not identified above analytical laboratory detection limits in any of the groundwater samples collected during our November 2014 sampling event.

Naphthalenes

Naphthalenes (naphthalene, 2-methylnaphthalene & 1-methylnaphthalene) were not identified above analytical laboratory detection limits in any of the groundwater samples collected during our November 2014 sampling event.

5.0 FINDINGS AND CONCLUSIONS

Based on results of the four quarterly groundwater monitoring events completed in 2014, the findings and conclusions of this report are as follows:

- Diesel-range TPH concentrations in the four wells remained below the MTCA Method A cleanup level of 500 µg/L during all four consecutive quarterly groundwater monitoring events performed in 2014.
- Oil-range TPH concentrations in the four wells either remained non-detect or decreased over each event and remained below the MTCA Method A cleanup level of 500 µg/L.
- BTEX, cPAHs and naphthalenes were not detected above analytical laboratory detection limits in the two events (August & November) sample and analyzed.
- Based on the current groundwater results, the concentrations within the central portion of the plume, near MW-4, have reduced significantly as compared to the grab sample collected by others. It appears that the removal of the source area and the application of the enhanced bio-remediation agent (Advanced ORC-A®) has promoted the metabolism of residual petroleum hydrocarbons and the installation of the ORC has likely had a positive effect.
- The groundwater gradient at the site has remained consistently toward the west –southwest.

The groundwater samples collected from the temporary groundwater monitoring wells prior to the remedial excavation and addition of the ORC, contained concentrations of diesel-range TPH reported as high as 5,800 µg/L and oil-range TPH reported as high as 9,000 µg/L. The four permanent groundwater monitoring wells which were placed in relative down-gradient (MW-1), up-gradient (MW-2 & MW-3) and source area (MW-4) locations have not contained groundwater concentrations of petroleum hydrocarbons above regulatory action levels. Therefore, it appears that the spill has been adequately addressed and that source removal followed by addition of the ORC was successful in cleaning up the spill.

6.0 RECOMMENDATIONS

Based on analytical results of the four quarters of groundwater sampling, additional groundwater monitoring events do not appear warranted.

We recommend that the facility be enrolled into the Voluntary Cleanup Program (VCP) for review of the associated reports with the spill incident 12-0773 for the purpose of receiving a No Further Action (NFA) determination associated with this spill.

The purge groundwater which has been accumulated and stored onsite in 55-gallon DOT approved metal drums can be either disposed off-site at a regulated facility or processed through the onsite oil/water separator associated with the onsite pressure washing/degreasing station.

FIGURES

Figure 1 - Site Vicinity Map

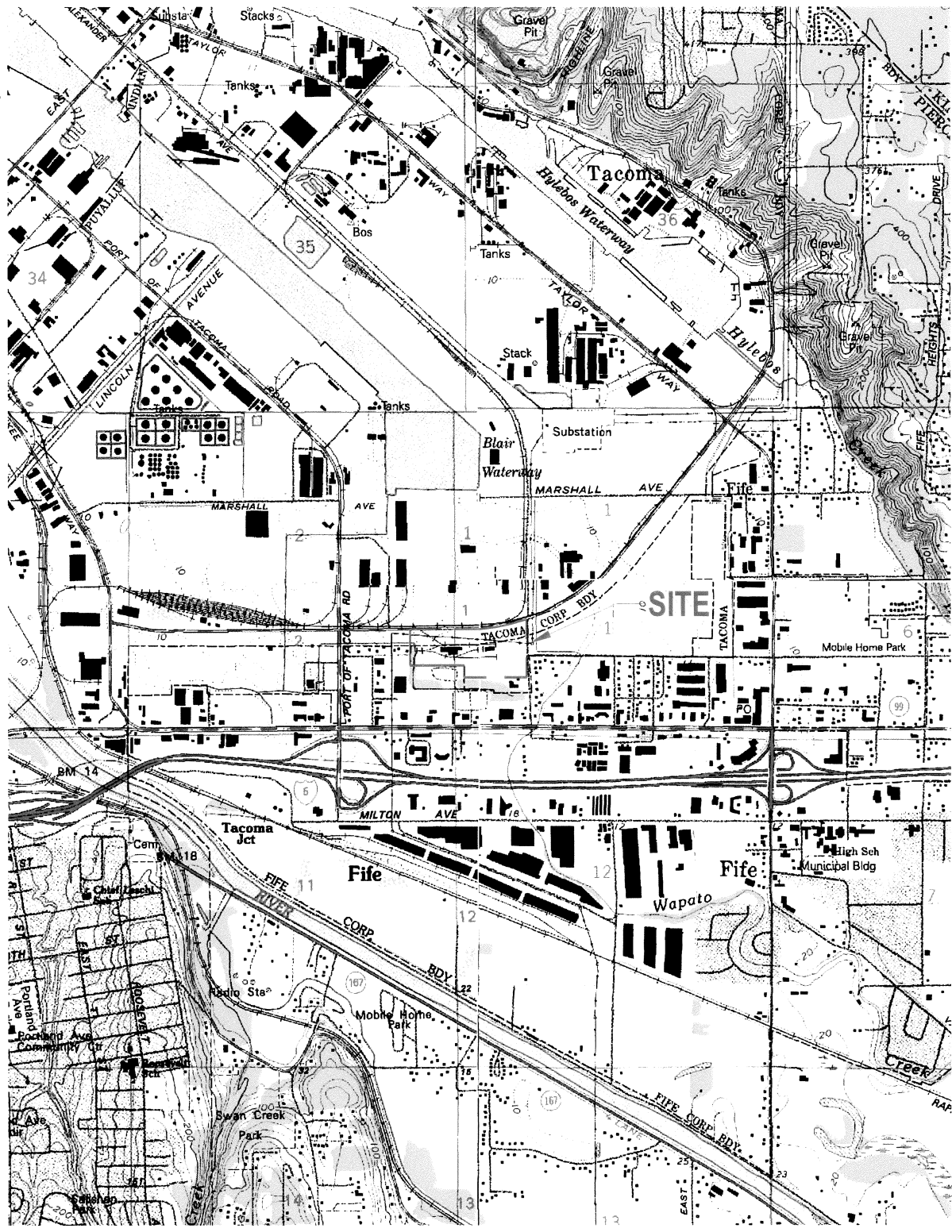
Figure 2 – Site Diagram

Figure 3 - Groundwater Migration Gradient – February 2014

Figure 4 - Groundwater Migration Gradient – May 2014

Figure 5 - Groundwater Migration Gradient – August 2014

Figure 6 - Groundwater Migration Gradient – November 2014



LEGEND:

--- Approximate site boundary

USGS Topographic Map, Tacoma North, Tacoma South, Poverty Bay, and Puyallup Quadrangles, 1994

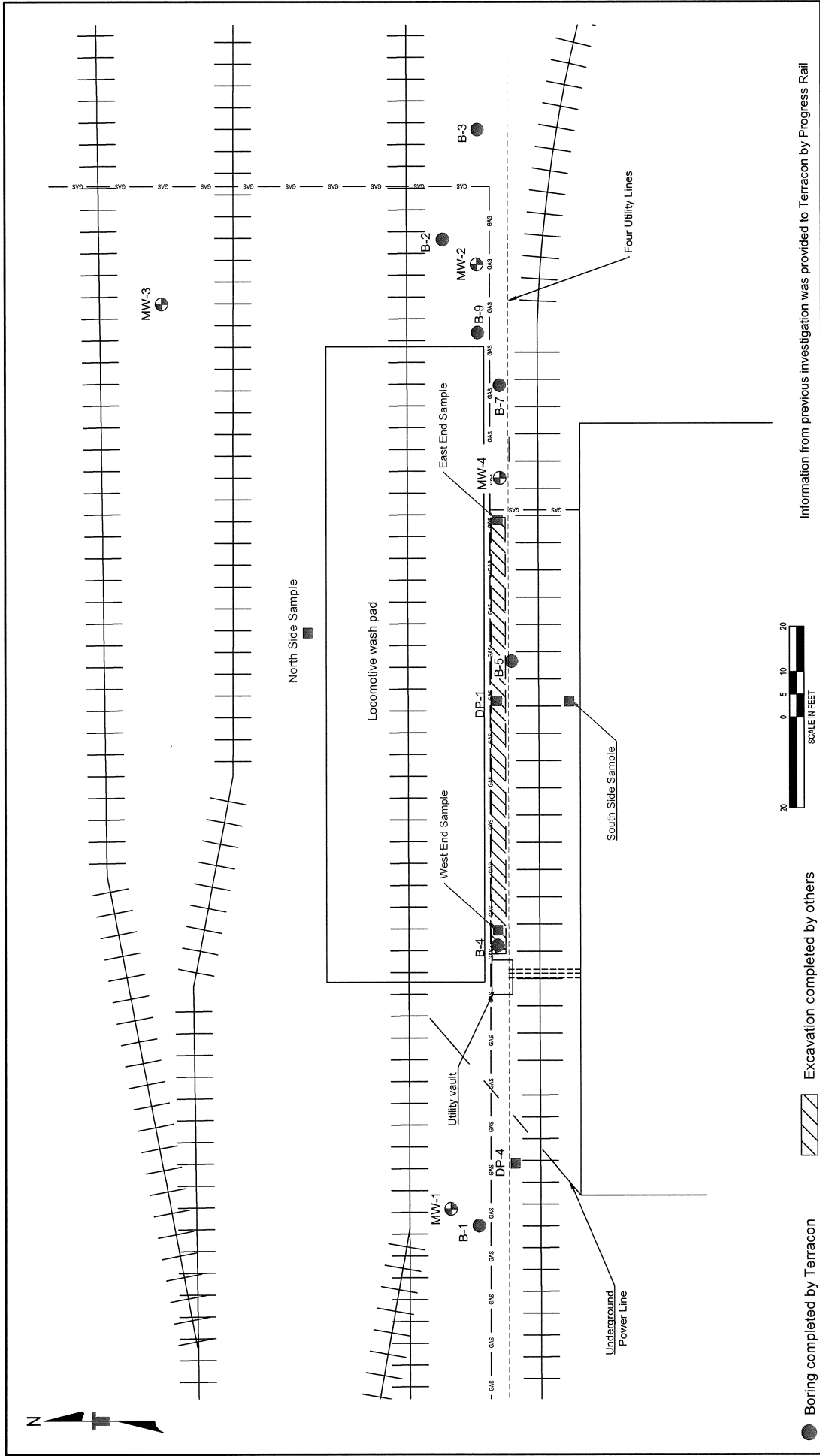
Project Mng:	EAD
Drawn By:	EAD
Checked By:	EAD
Approved By:	MYW

Project No.	81127060
Scale:	Not to scale
File No.	81127060 Fig 1.dwg
Date:	January 2014


Terracon
 Consulting Engineers and Scientists
 21905 64th Avenue W., Ste 100 Mounlake Terrace, WA 98043
 PH. (425) 771-3304 FAX. (425) 771-3549




Site Vicinity Map
 Progress Rail
 4012 SR 509 South Frontage Road
 Tacoma, Pierce County, Washington

FIG. No.
 1



Information from previous investigation was provided to Terracon by Progress Rail

Excavation completed by others  **Excavation completed by others**

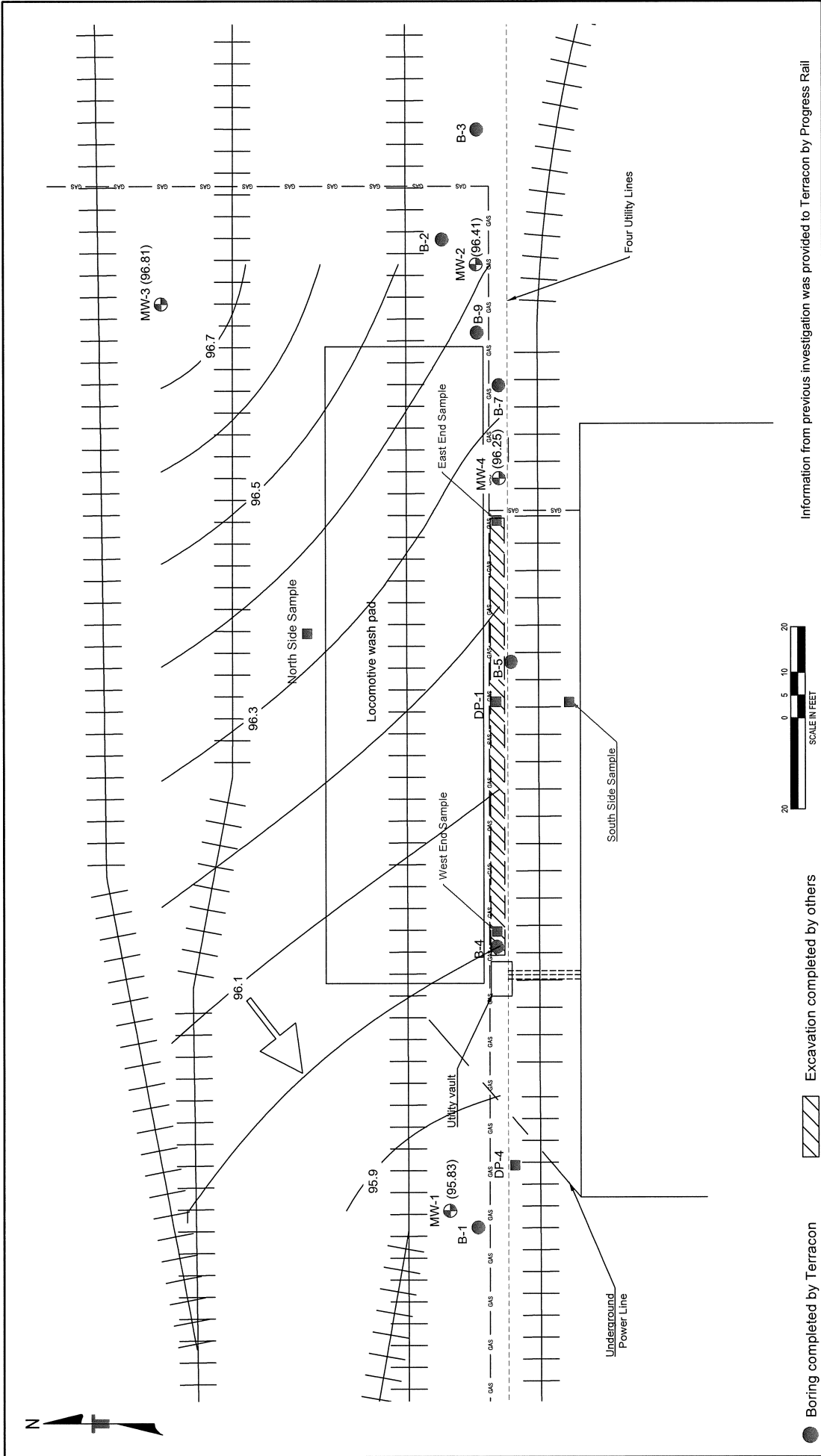
Boring completed by Terracon  **Monitoring well completed by Terracon**  **Boring completed by others** 

Project No.	8127090
Scale	Not to scale
Drawn By:	EAD
Checked By:	EAD
Approved By:	MWV
Date:	March 2014

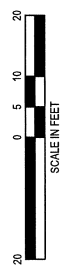
Terracon
 Consulting Engineers and Scientists
 2202 54th Avenue N.E. Ste 100 • Issaquah, WA 98028
 Ph: (206) 777-8300 Fax: (206) 777-3358

Site Diagram
 Progress Rail Site
 4012 SR 509 South Frontage Road
 Tacoma, Pierce County, Washington

FIG. No. **2**



Information from previous investigation was provided to Terracon by Progress Rail



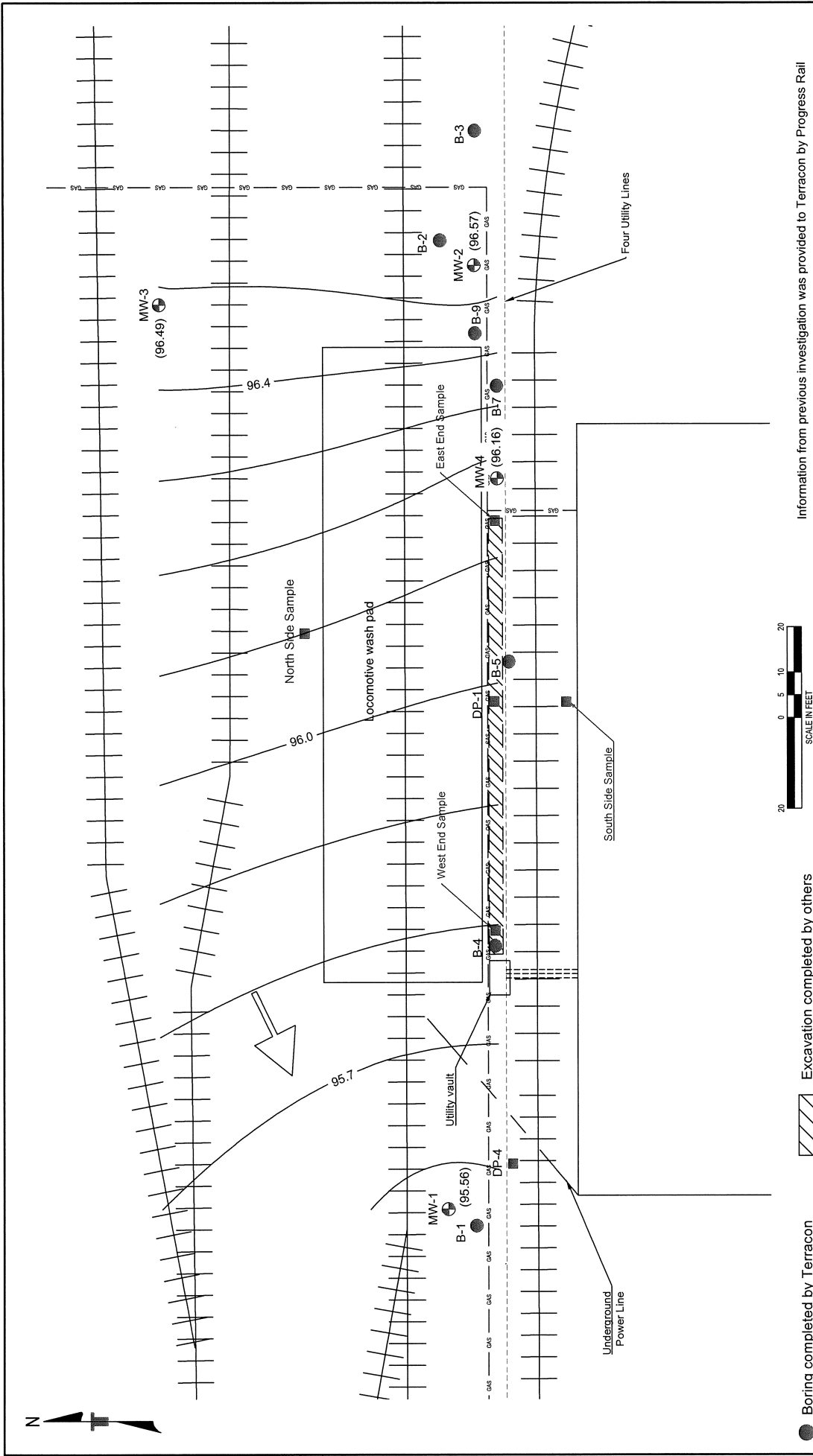
Terracon
Consulting Engineers and Scientists
21995 54th Avenue W, Ste 100, Mountlake Terrace, WA 98043
PH: (425) 733-9394 FAX: (425) 733-9349

GROUNDWATER CONTOUR MAP - February 2014
Progress Rail Site
4012 SR 509 South Frontage Road
Tacoma, Pierce County, Washington

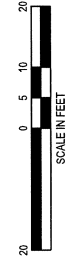
FIG. No. **3**

Project No.:	8112/060
Scale:	Not to scale
Drawn By:	EAD
Checked By:	EAD
Approved By:	MYW
Date:	March 2014

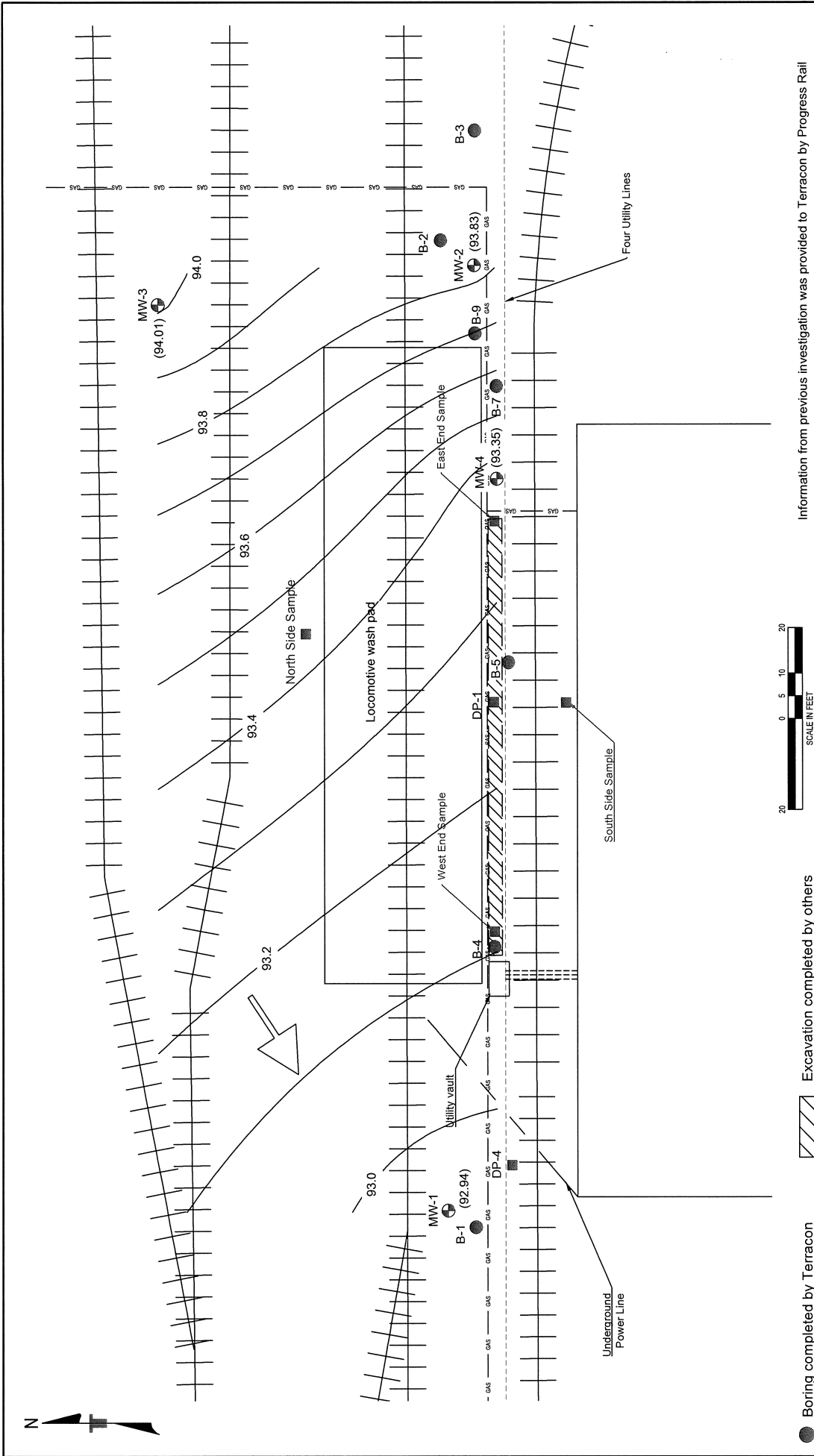
- Boring completed by Terracon
- Monitoring well completed by Terracon
- Boring completed by others
- ▨ Excavation completed by others
- Groundwater migration direction



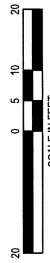
Information from previous investigation was provided to Terracon by Progress Rail



Terracon Consulting Engineers and Scientists 2180 5th Avenue Vt. Ste 100 Mountlake Terrace WA 98043 PH: (425) 733304 FAX: (425) 733368		GROUNDWATER CONTOUR MAP May 2014 Progress Rail Site 4012 SR 509 South Frontage Road Tacoma, Pierce County, Washington	FIG. No. 4
Project No.: 81127060 Scale: Not to scale Date: March 2014	Project Manager: EAD Drawn By: EAD Checked By: EAD Approved By: MVW	Legend: ● Boring completed by Terracon ⊕ Monitoring well completed by Terracon ■ Boring completed by others ▨ Excavation completed by others ⇨ Groundwater migration direction	



Information from previous investigation was provided to Terracon by Progress Rail

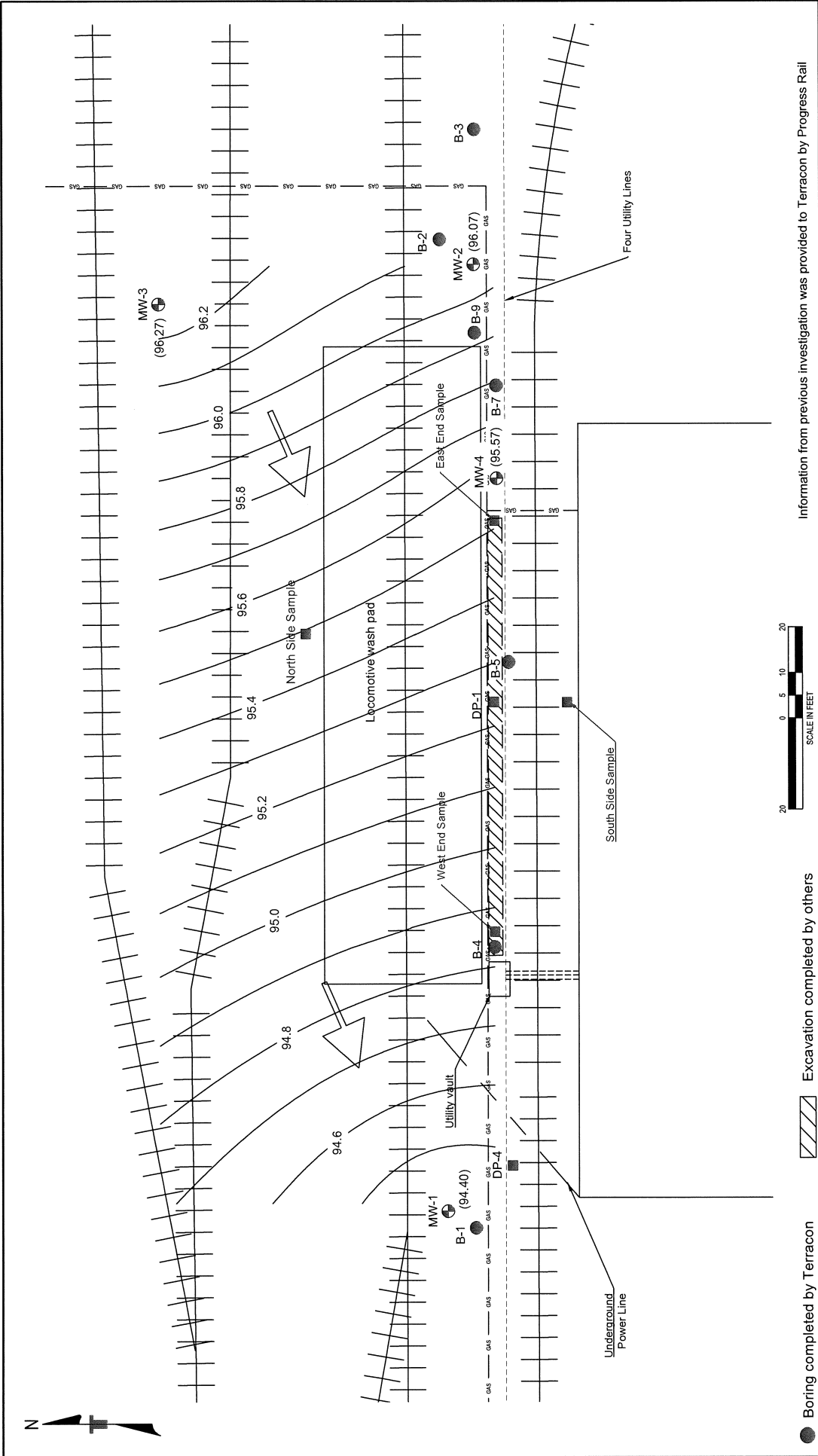


- Boring completed by Terracon
- Monitoring well completed by Terracon
- Boring completed by others
- Excavation completed by others
- Groundwater migration direction

Project No.	81127060
Scale	Not to scale
Drawn By:	EAD
Checked By:	EAD
Approved By:	MWV
Date:	August 2014

Terracon
Consulting Engineers and Scientists
2805 6th Avenue W, Ste 100 - Mountlake Terrace, WA 98043
PH: (425) 733-3908 FAX: (425) 733-3908

GROUNDWATER CONTOUR MAP August 2014
Progress Rail Site
4012 SR 509 South Frontage Road
Tacoma, Pierce County, Washington



Information from previous investigation was provided to Terracon by Progress Rail

SCALE IN FEET
 0 5 10 20

- Boring completed by Terracon
- Monitoring well completed by Terracon
- Boring completed by others
- Excavation completed by others
- Groundwater migration direction

Project No.	81127060
Scale	As shown
File No.	
Date	January 2015

Terracon
 Consulting Engineers and Scientists
 2285 5th Avenue W. Ste. 300 - Burien, WA 98148
 P: 425-733-8284 F: 425-733-8285

GROUNDWATER CONTOUR MAP November 2014
 Progress Rail Site
 4012 SR 509 South Frontage Road
 Tacoma, Pierce County, Washington

FIG. No. **6**

TABLES

Table 1 – Summary of Depth to Groundwater Measurements

Table 2 – Summary of Groundwater Analytical Results – TPH DX

**Table 3 – Summary of Groundwater Analytical Results – BTEX,
cPAHs, Naphthalenes**

TABLE 1

**SUMMARY OF DEPTH TO GROUNDWATER MEASUREMENTS
 Progress Rail Spill Incident # 12-0773
 4012 SR 509 South Frontage Road
 Tacoma, Pierce County, Washington**

Well Number	Sample Date	TOC Elevation (Feet)	Depth to Water (Feet)	Depth to Product (Feet)	Relative Groundwater Elevation (Feet)
MW-1 Screened 4-14'	8/16/2013	98.24	5.70	0.00	92.54
	2/17/2014	98.24	2.41	0.00	95.83
	5/15/2014	98.24	2.68	0.00	95.56
	8/14/2014	98.24	5.30	0.00	92.94
	11/13/2014	98.24	3.84	0.00	94.40
MW-2 screened 4-14'	8/16/2013	98.95	5.85	0.00	93.10
	2/17/2014	98.95	2.54	0.00	96.41
	5/15/2014	98.95	2.38	0.00	96.57
	8/14/2014	98.95	5.12	0.00	93.83
	11/13/2014	98.95	2.88	0.00	96.07
MW-3 screened 5-15'	2/17/2014	99.33	2.52	0.00	96.81
	5/15/2014	99.33	2.84	0.00	96.49
	8/14/2014	99.33	5.32	0.00	94.01
	11/13/2014	99.33	3.06	0.00	96.27
MW-4 screened 5-15'	2/17/2014	98.96	2.71	0.00	96.25
	5/15/2014	98.96	2.80	0.00	96.16
	8/14/2014	98.96	5.61	0.00	93.35
	11/13/2014	98.96	3.39	0.00	95.57

* all the monitoring wells are 2-inch diameter casings

TABLE 2

SUMMARY OF GROUNDWATER ANALYTICAL RESULTS - TPH DX

Progress Rail Spill Incident # 12-0773

4012 SR 509 South Frontage Road

Tacoma, Pierce County, Washington

all concentrations are in micrograms per liter (µg/l)

Sample	Sampled Collected By:	Sample Date	TPH DX (NWTPH DX)	
			Diesel-Range	Oil-Range
DP-1	Panhandle	5/22/12	2,300	1,000
DP-2		5/22/12	450	700
DP-4		5/22/12	560	1,500
B-1	Terracon	11/15/12	220x	ND <250
B-2		11/15/12	140x	ND <250
B-3		11/15/12	380x	ND <250
B-4		11/15/12	330x	390x
B-5		11/15/12	5,800	9,800x
B-7		11/15/12	900x	760x
B-9		11/15/12	140x	ND <250
MW-1		8/16/13	62x	ND <250
		2/17/14	150x	ND <250
		5/15/14	220x	ND <250
		8/14/14	120	ND <250
		11/13/14	240x	ND <250
MW-2		8/16/13	94x	ND <250
	2/17/14	200x	ND <250	
	5/15/14	270x	ND <250	
	8/14/14	120	ND <250	
	11/13/14	190x	ND <250	
MW-3	2/17/14	74x	ND <250	
	5/15/14	ND <50	ND <250	
	8/14/14	ND <50	ND <250	
	11/13/14	ND <50	ND <250	
MW-4	2/17/14	390x	410x	
	5/15/14	400x	260x	
	8/14/14	250	ND <250	
	11/13/14	300x	ND <250	
MTCA Method A Cleanup Level			500	500

Note: Values reported above detection limits are in bold.
 Shaded cells are values that exceed cleanup levels.

TPH - total petroleum hydrocarbons

MTCA - Model Toxics Control Act

x - the sample chromatograph pattern does not resemble the fuel standard for quantitation

TABLE 3

SUMMARY OF GROUNDWATER ANALYTICAL RESULTS - BTEX, cPAHs, Naphthalenes
Progress Rail Spill Incident # 12-0773
4012 SR 509 South Frontage Road
Tacoma, Pierce County, Washington

all concentrations are in micrograms per liter (µg/l)

Sample Name	Sample Date	BTEX				VOC	cPAHs
		Benzene	Toluene	Ethylbenzene	Xylenes	Naphthalenes	Varies
MW-1	8/14/2014	ND (<1)	ND (<1)	ND (<1)	ND (<3)	ND (<0.1)	ND (<0.1)
	11/13/2014	ND (<1)	ND (<1)	ND (<1)	ND (<3)	ND (<0.1)	ND (<0.1)
MW-2	8/14/2014	ND (<1)	ND (<1)	ND (<1)	ND (<3)	ND (<0.1)	ND (<0.1)
	11/13/2014	ND (<1)	ND (<1)	ND (<1)	ND (<3)	ND (<0.1)	ND (<0.1)
MW-3	8/14/2014	ND (<1)	ND (<1)	ND (<1)	ND (<3)	ND (<0.1)	ND (<0.1)
	11/13/2014	ND (<1)	ND (<1)	ND (<1)	ND (<3)	ND (<0.1)	ND (<0.1)
MW-4	8/14/2014	ND (<1)	ND (<1)	ND (<1)	ND (<3)	ND (<0.1)	ND (<0.1)
	11/13/2014	ND (<1)	ND (<1)	ND (<1)	ND (<3)	ND (<0.1)	ND (<0.1)
MTCA Method A Cleanup Level		5	1,000	700	1,000	160	0.1

- BTEX - benzene, toluene, ethylbenzene, xylenes
- VOCs - volatile organic compounds
- cPAHs - carcinogenic polycyclic aromatic hydrocarbons
- MTCA - Model Toxics Control Act
- ND - Not detected above laboratory reporting limit.

APPENDIX

Analytical Reports and Chain-of-Custody Documentation

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

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

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

February 24, 2014

Eric A. Dubcak, Project Manager
Terracon
Pacific Cascade Building
21905 64th Ave. W., Suite 100
Mountlake Terrace, WA 98043

Dear Mr. Dubcak:

Included are the results from the testing of material submitted on February 18, 2014 from the 81127060, F&BI 402225 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
TRC0224R.DOC

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

CASE NARRATIVE

This case narrative encompasses samples received on February 18, 2014 by Friedman & Bruya, Inc. from the Terracon 81127060, F&BI 402225 project. Samples were logged in under the laboratory ID's listed below.

<u>Laboratory ID</u>	<u>Terracon</u>
402225-01	MW-1-021714
402225-02	MW-2-021714
402225-03	MW-3-021714
402225-04	MW-4-021714

All quality control requirements were acceptable.

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 02/24/14
Date Received: 02/18/14
Project: 81127060, F&BI 402225
Date Extracted: 02/18/14
Date Analyzed: 02/19/14

**RESULTS FROM THE ANALYSIS OF WATER SAMPLES
FOR TOTAL PETROLEUM HYDROCARBONS AS
DIESEL AND MOTOR OIL
USING METHOD NWTPH-Dx**
Results Reported as ug/L (ppb)

<u>Sample ID</u> Laboratory ID	<u>Diesel Range</u> (C ₁₀ -C ₂₅)	<u>Motor Oil Range</u> (C ₂₅ -C ₃₆)	<u>Surrogate</u> (% Recovery) (Limit 51-134)
MW-1-021714 402225-01	150 x	<250	92
MW-2-021714 402225-02	200 x	<250	95
MW-3-021714 402225-03	74 x	<250	107
MW-4-021714 402225-04	390 x	410 x	108
Method Blank 04-341 MB2	<50	<250	105

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 02/24/14

Date Received: 02/18/14

Project: 81127060, F&BI 402225

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

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Diesel Extended	ug/L (ppb)	2,500	87	100	58-134	14

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

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.
- A1 - More than one compound of similar molecule structure was identified with equal probability.
- 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 this range fell outside of acceptance criteria. The value reported is an estimate.
- c - The presence of the analyte indicated may be due to carryover from previous sample injections.
- d - The sample was diluted. Detection limits may be raised due to dilution.
- ds - The sample was diluted. Detection limits are raised due to dilution and surrogate recoveries may not be meaningful.
- dv - Insufficient sample was available to achieve normal reporting limits and limits are raised accordingly.
- fb - Analyte present in the blank and the sample.
- 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. The variability is attributed to sample inhomogeneity.
- ht - Analysis performed outside the method or client-specified holding time requirement.
- ip - Recovery fell outside of normal control limits. Compounds in the sample matrix interfered with the quantitation of the analyte.
- j - The result is below normal reporting limits. 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 analyte result in the laboratory control sample is out of control limits. The reported concentration should be considered an estimate.
- jr - The rpd result in laboratory control sample associated with the analyte is 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 compound indicated 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 in a container not approved by the method. The value reported should be considered an estimate.
- pr - The sample was received with incorrect preservation. The value reported should be considered an estimate.
- ve - Estimated concentration calculated for an analyte response above the valid instrument calibration range. A dilution is required to obtain an accurate quantification of the analyte.
- 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.

402225

SAMPLE CHAIN OF CUSTODY

ME 02/18/14 COS

Send Report To Eric Pakbrak
 Company Terracon
 Address 21905-64th Ave W Ste 102
 City, State, ZIP Mountlake Terrace WA 98043
 Phone # 425-747-7849 Fax # 98043

SAMPLERS (signature) [Signature]
 PROJECT NAME/NO. Regius Am-1
B127060
 PO # 1
 REMARKS arrived to
suburb@terracon.com

Page # 1 of 1
 TURNOROUND TIME
 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	Time	Sample Type	# of containers	ANALYSES REQUESTED					Notes	
						TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by 8260	SVOCs by 8270		HFS
MW-1-021714	01	2-17-14	14:52	GW	1	X						
MW-2-021714	02		15:00		1	X						
MW-3-021714	03		14:29		1	X						
MW-4-021714	04		15:20		1	X						

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

FORMS\COCC\COCC.DOC

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
<u>[Signature]</u>	<u>Adam Stauffer</u>	<u>Terracon</u>	<u>2-18-14</u>	<u>09:40</u>
<u>[Signature]</u>	<u>James Bledsoe</u>	<u>FPB</u>	<u>2/18/14</u>	<u>07:40</u>
Received by:				

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

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

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

May 23, 2014

Eric A. Dubcak, Project Manager
Terracon
Pacific Cascade Building
21905 64th Ave. W., Suite 100
Mountlake Terrace, WA 98043

Dear Mr. Dubcak:

Included are the results from the testing of material submitted on May 15, 2014 from the Progress Rail, 81127060, F&BI 405294 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
TRC0523R.DOC

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

CASE NARRATIVE

This case narrative encompasses samples received on May 15, 2014 by Friedman & Bruya, Inc. from the Terracon Progress Rail, 81127060, F&BI 405294 project. Samples were logged in under the laboratory ID's listed below.

<u>Laboratory ID</u>	<u>Terracon</u>
405294 -01	MW-1
405294 -02	MW-2
405294 -03	MW-3
405294 -04	MW-4

All quality control requirements were acceptable.

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 05/23/14
Date Received: 05/15/14
Project: Progress Rail, 81127060, F&BI 405294
Date Extracted: 05/19/14
Date Analyzed: 05/20/14

**RESULTS FROM THE ANALYSIS OF WATER SAMPLES
FOR TOTAL PETROLEUM HYDROCARBONS AS
DIESEL AND MOTOR OIL
USING METHOD NWTPH-Dx**
Results Reported as ug/L (ppb)

<u>Sample ID</u> Laboratory ID	<u>Diesel Range</u> (C ₁₀ -C ₂₅)	<u>Motor Oil Range</u> (C ₂₅ -C ₃₆)	<u>Surrogate</u> <u>(% Recovery)</u> (Limit 47-140)
MW-1 405294-01	220 x	<250	83
MW-2 405294-02	270 x	<250	80
MW-3 405294-03	<50	<250	74
MW-4 405294-04	400 x	260 x	78
Method Blank 04-997 MB	<50	<250	80

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 05/23/14

Date Received: 05/15/14

Project: Progress Rail, 81127060, F&BI 405294

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

Laboratory Code: Laboratory Control Sample

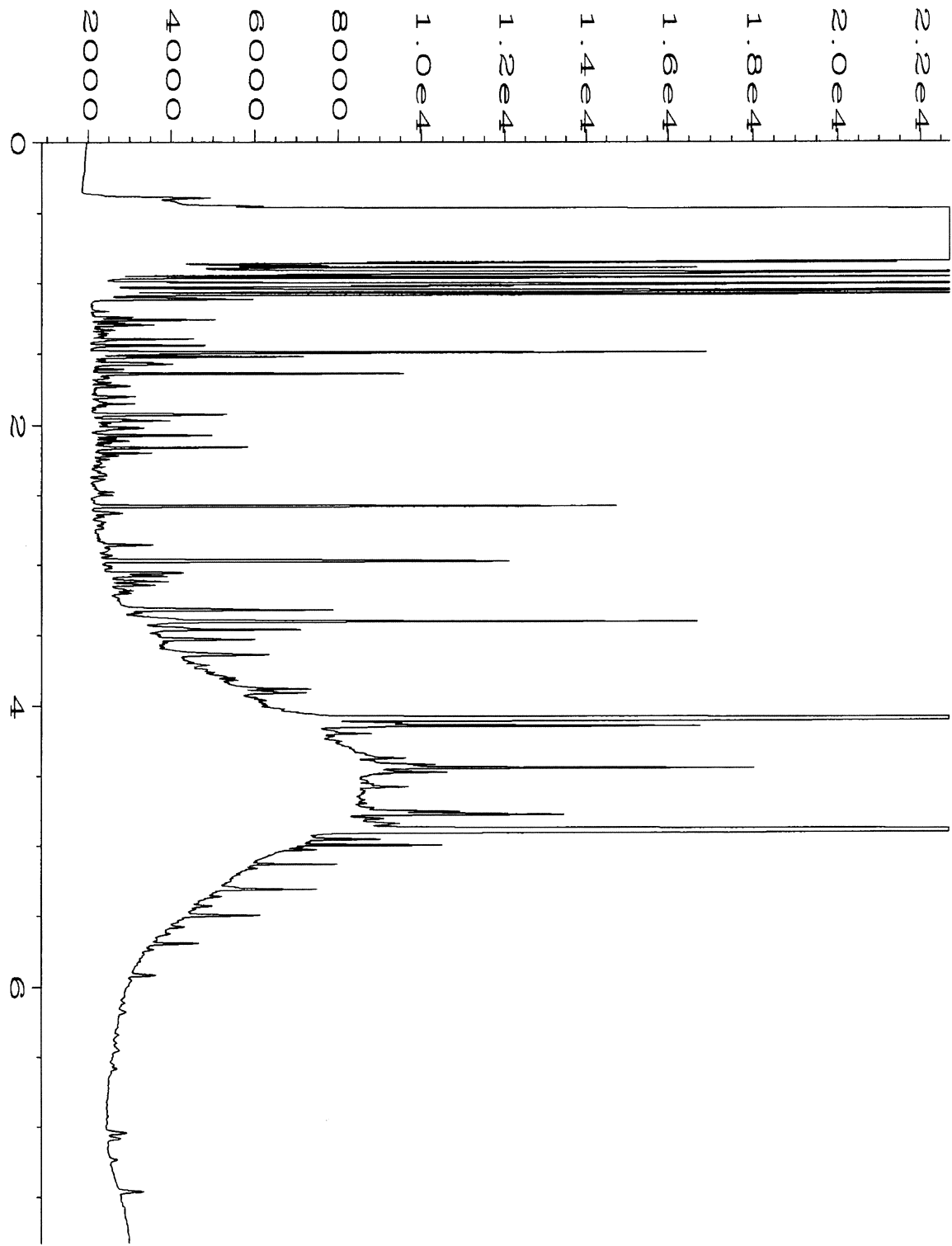
Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Diesel Extended	ug/L (ppb)	2,500	101	104	61-133	3

FRIEDMAN & BRUYA, INC.

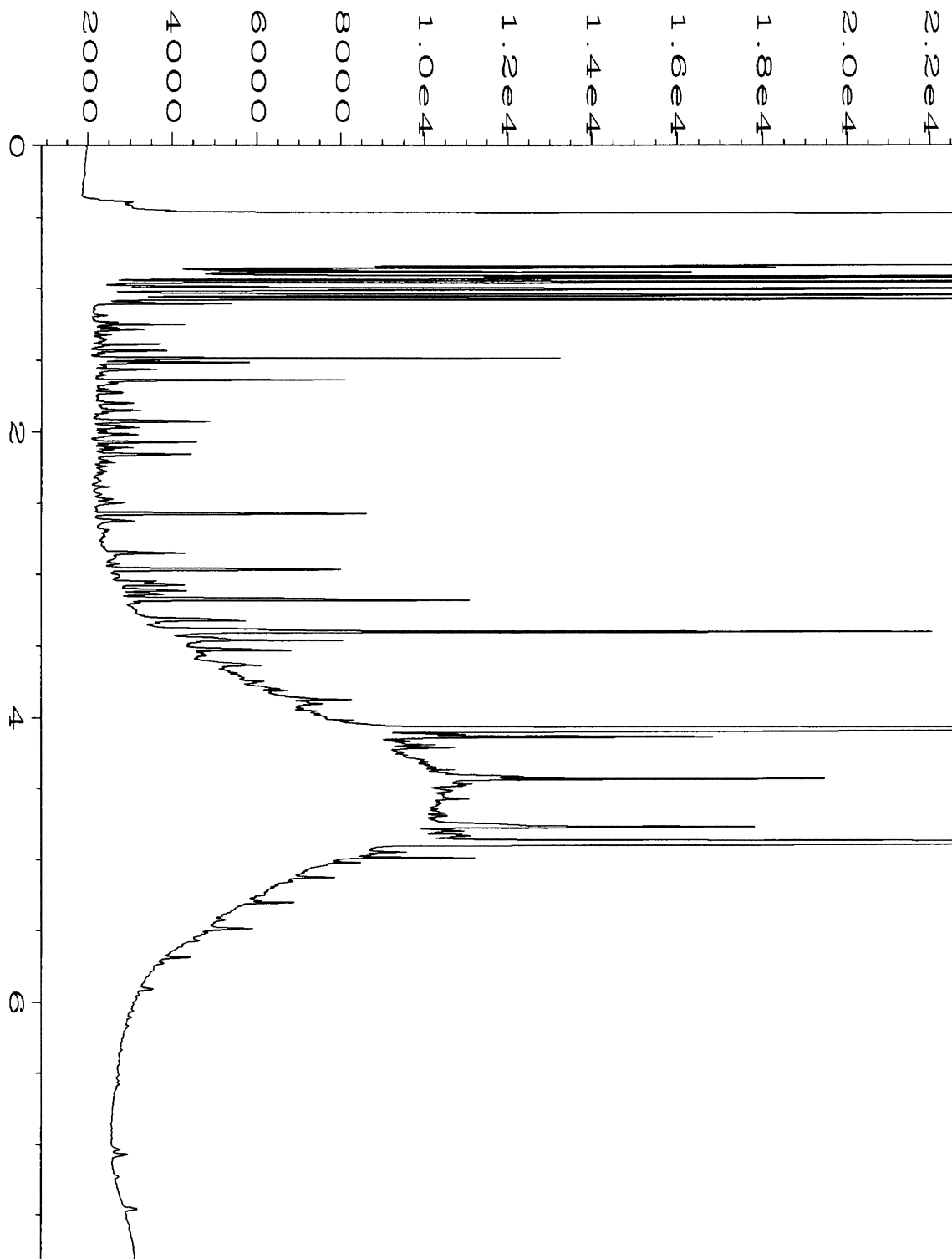
ENVIRONMENTAL CHEMISTS

Data Qualifiers & Definitions

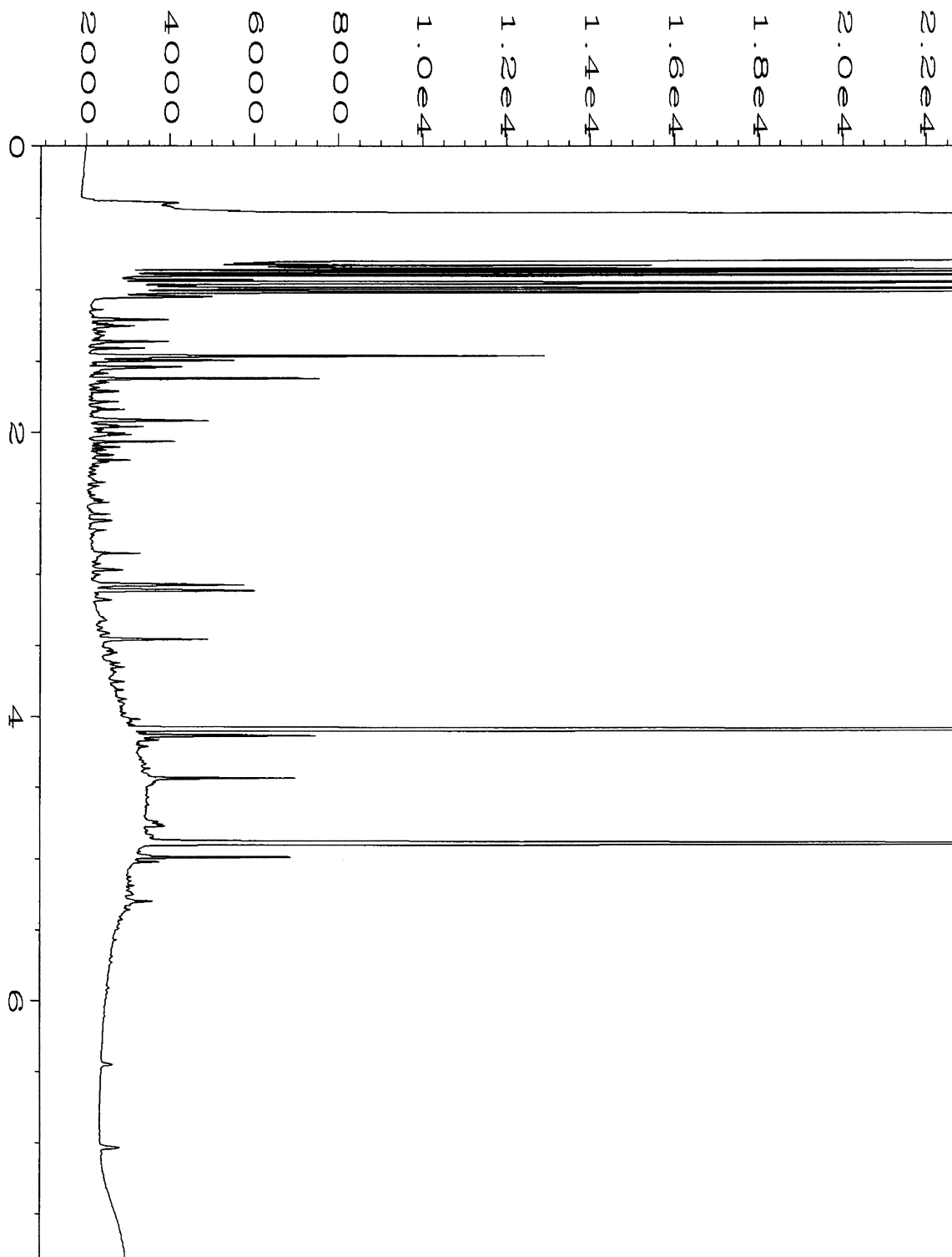
- a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.
- b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not 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.



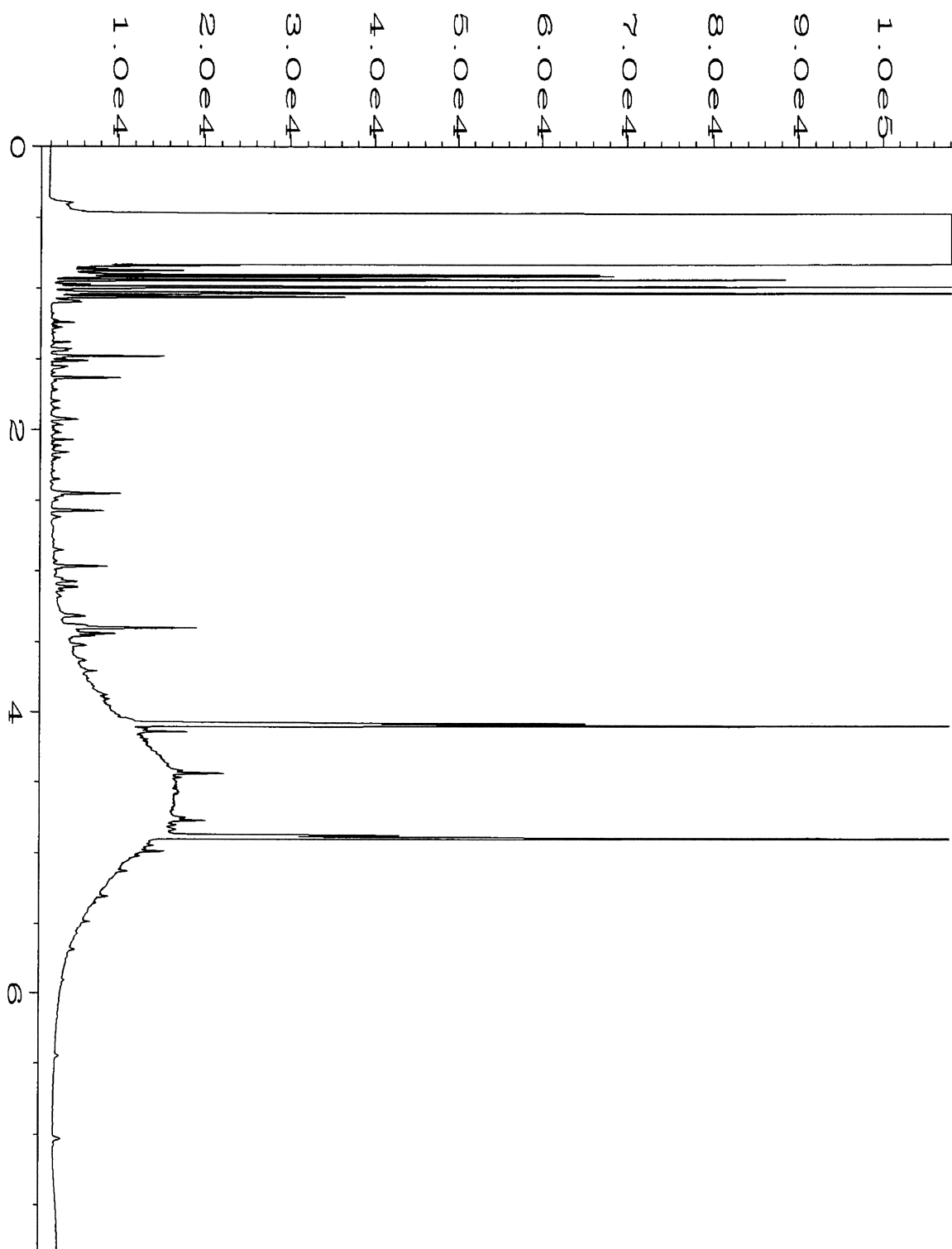
Data File Name	: C:\HPCHEM\4\DATA\05-20-14\034F0501.D	Page Number	: 1
Operator	: sp	Vial Number	: 34
Instrument	: GC#4	Injection Number	: 1
Sample Name	: 405294-01	Sequence Line	: 5
Run Time Bar Code:		Instrument Method:	DX.MTH
Acquired on	: 20 May 14 03:50 PM	Analysis Method	: DX.MTH
Report Created on:	21 May 14 10:28 AM		



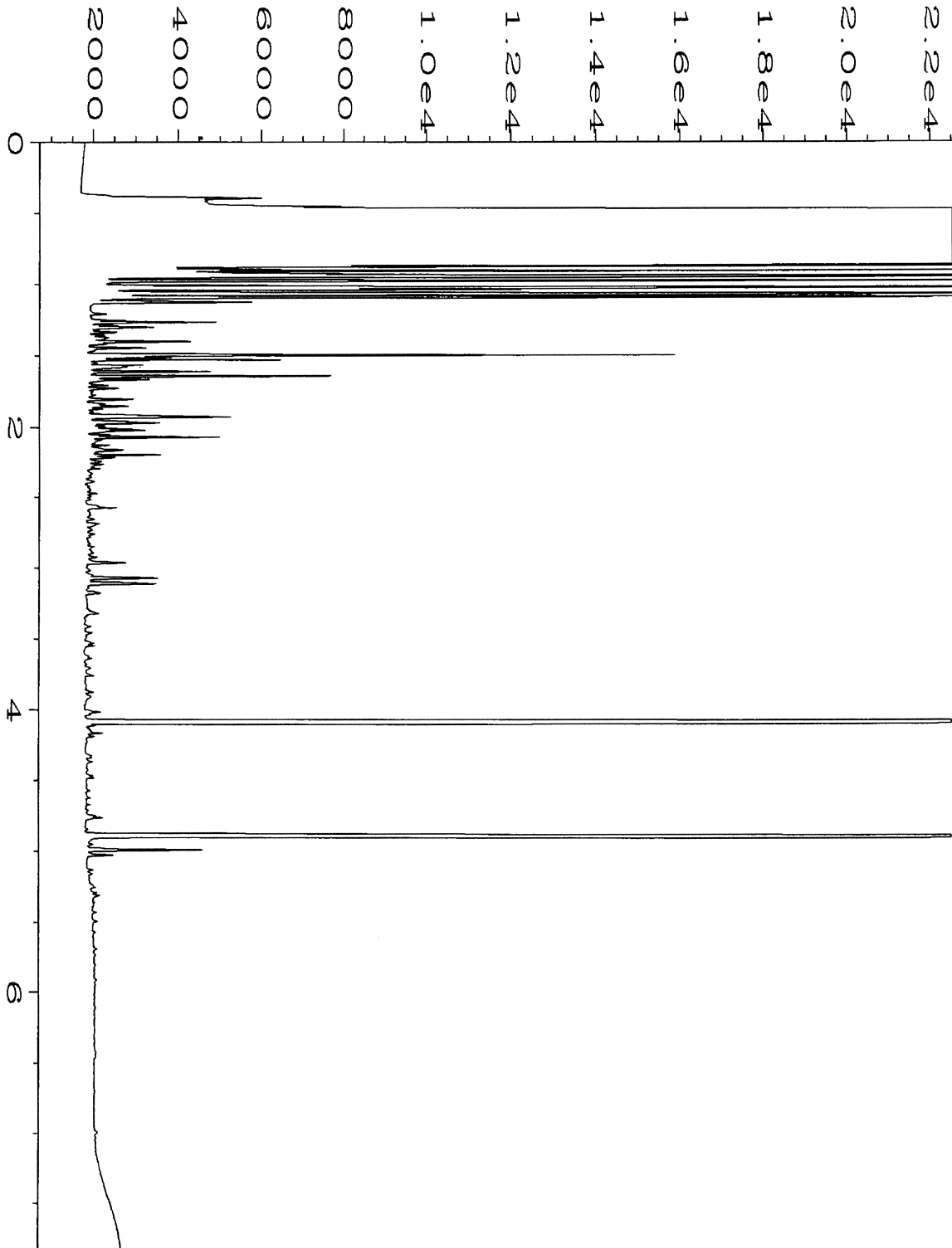
Data File Name	: C:\HPCHEM\4\DATA\05-20-14\035F0501.D	Page Number	: 1
Operator	: sp	Vial Number	: 35
Instrument	: GC#4	Injection Number	: 1
Sample Name	: 405294-02	Sequence Line	: 5
Run Time Bar Code:		Instrument Method:	DX.MTH
Acquired on	: 20 May 14 04:04 PM	Analysis Method	: DX.MTH
Report Created on:	21 May 14 10:28 AM		



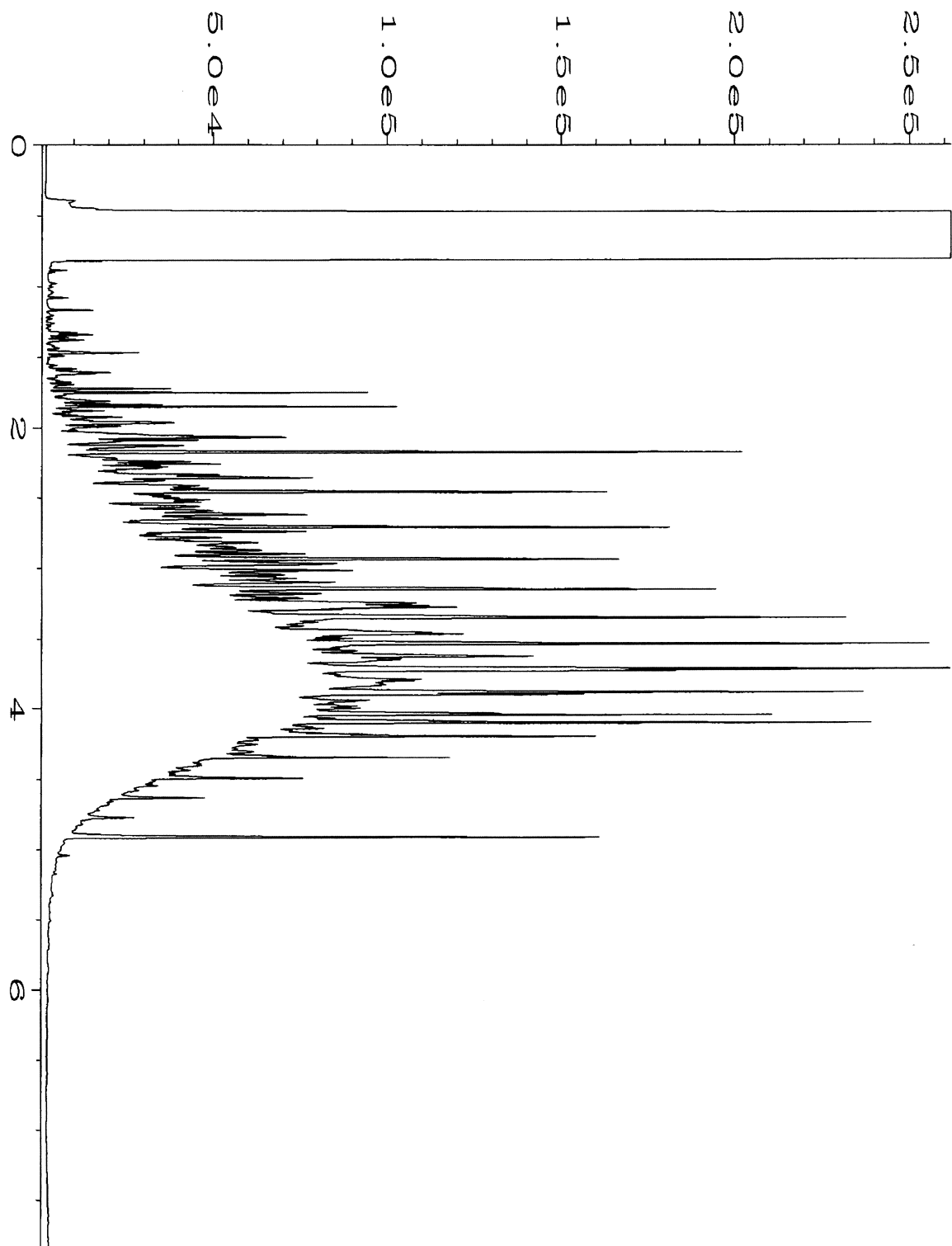
Data File Name	: C:\HPCHEM\4\DATA\05-20-14\036F0501.D	Page Number	: 1
Operator	: sp	Vial Number	: 36
Instrument	: GC#4	Injection Number	: 1
Sample Name	: 405294-03	Sequence Line	: 5
Run Time Bar Code:		Instrument Method:	DX.MTH
Acquired on	: 20 May 14 04:18 PM	Analysis Method	: DX.MTH
Report Created on:	21 May 14 10:28 AM		



Data File Name	: C:\HPCHEM\4\DATA\05-20-14\037F0501.D	Page Number	: 1
Operator	: sp	Vial Number	: 37
Instrument	: GC#4	Injection Number	: 1
Sample Name	: 405294-04	Sequence Line	: 5
Run Time Bar Code:		Instrument Method:	DX.MTH
Acquired on	: 20 May 14 04:31 PM	Analysis Method	: DX.MTH
Report Created on:	21 May 14 10:28 AM		



Data File Name	: C:\HPCHEM\4\DATA\05-21-14\027F0401.D	Page Number	: 1
Operator	: sp	Vial Number	: 27
Instrument	: GC#4	Injection Number	: 1
Sample Name	: 04-997 mb	Sequence Line	: 4
Run Time Bar Code:		Instrument Method:	DX.MTH
Acquired on	: 21 May 14 01:58 PM	Analysis Method	: DX.MTH
Report Created on:	22 May 14 09:36 AM		



Data File Name	: C:\HPCHEM\4\DATA\05-20-14\005F0401.D	Page Number	: 1
Operator	: sp	Vial Number	: 5
Instrument	: GC#4	Injection Number	: 1
Sample Name	: 1000 Dx 42-113B	Sequence Line	: 4
Run Time Bar Code:		Instrument Method:	DX.MTH
Acquired on	: 20 May 14 02:40 PM	Analysis Method	: DX.MTH
Report Created on:	21 May 14 10:30 AM		

405294

SAMPLE CHAIN OF CUSTODY

ME 05/15/14

E03

Send Report To Erik Obeak

Company Terracon

Address 21905 64th Ave. W.

City, State, ZIP Mountlake Terrace, WA

Phone # 425-771-3304 Fax # 425-771-3549

SAMPLERS (signature) S. Kyle Long

PROJECT NAME/NO. Progress Rail

PO# 01127060

REMARKS

Page # 1 of 1

TURNAROUND TIME
 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	ANALYSES REQUESTED						Notes		
						TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by 8260	SVOCs by 8270	HFS			
MW-1	01	5/15/14	13:56	GW	1	X								
MW-2	02	5/15/14	13:56	GW	1	X								
MW-3	03	5/15/14	13:56	GW	1	X								
MW-4	04	5/15/14	13:56	GW	1	X								
Sos/														

Samples received at 6 °C

Friedman & Bruya, Inc.
3012 16th Avenue West
Seattle, WA 98119-2029

Ph. (206) 285-8282
Fax (206) 283-5044

Relinquished by: <u>[Signature]</u>	PRINT NAME	COMPANY	DATE	TIME
Relinquished by: <u>[Signature]</u>	S. Kyle Long	Terracon	5/15/14	15:40

Received by: <u>[Signature]</u>	PRINT NAME	COMPANY	DATE	TIME
Received by: <u>[Signature]</u>	Michael Estell	FRM		

FORMS\COC\COC.DOC

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

August 20, 2014

Eric A. Dubcak, Project Manager
Terracon
Pacific Cascade Building
21905 64th Ave. W., Suite 100
Mountlake Terrace, WA 98043

Dear Mr. Dubcak:

Included are the results from the testing of material submitted on August 14, 2014 from the 81127060, F&BI 408238 project. There are 12 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
TRC0820R.DOC

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

CASE NARRATIVE

This case narrative encompasses samples received on August 14, 2014 by Friedman & Bruya, Inc. from the Terracon 81127060, F&BI 408238 project. Samples were logged in under the laboratory ID's listed below.

<u>Laboratory ID</u>	<u>Terracon</u>
408238 -01	MW-3
408238 -02	MW-2
408238 -03	MW-4
408238 -04	MW-1

All quality control requirements were acceptable.

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 08/20/14
Date Received: 08/14/14
Project: 81127060, F&BI 408238
Date Extracted: 08/15/14
Date Analyzed: 08/15/14

**RESULTS FROM THE ANALYSIS OF WATER SAMPLES
FOR BENZENE, TOLUENE, ETHYLBENZENE, AND XYLENES
USING METHOD 8021B**

Results Reported as ug/L (ppb)

<u>Sample ID</u> Laboratory ID	<u>Benzene</u>	<u>Toluene</u>	<u>Ethyl Benzene</u>	<u>Total Xylenes</u>	<u>Surrogate (% Recovery)</u> Limit (52-124)
MW-3 408238-01	<1	<1	<1	<3	87
MW-2 408238-02	<1	<1	<1	<3	91
MW-4 408238-03	<1	<1	<1	<3	88
MW-1 408238-04	<1	<1	<1	<3	89
Method Blank 04-1657 MB	<1	<1	<1	<3	89

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 08/20/14
Date Received: 08/14/14
Project: 81127060, F&BI 408238
Date Extracted: 08/15/14
Date Analyzed: 08/15/14

**RESULTS FROM THE ANALYSIS OF WATER SAMPLES
FOR TOTAL PETROLEUM HYDROCARBONS AS
DIESEL AND MOTOR OIL
USING METHOD NWTPH-Dx**
Results Reported as ug/L (ppb)

<u>Sample ID</u> Laboratory ID	<u>Diesel Range</u> (C ₁₀ -C ₂₅)	<u>Motor Oil Range</u> (C ₂₅ -C ₃₆)	<u>Surrogate</u> (% Recovery) (Limit 41-152)
MW-3 408238-01	<50	<250	83
MW-2 408238-02	120	<250	78
MW-4 408238-03	250	<250	79
MW-1 408238-04	120	<250	94
Method Blank 04-1670 MB2	<50	<250	80

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	MW-3	Client:	Terracon
Date Received:	08/14/14	Project:	81127060, F&BI 408238
Date Extracted:	08/15/14	Lab ID:	408238-01 1/2
Date Analyzed:	08/15/14	Data File:	081523.D
Matrix:	Water	Instrument:	GCMS 10
Units:	ug/L (ppb)	Operator:	ya

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	97	50	150
Benzo(a)anthracene-d12	122	50	150

Compounds:	Concentration ug/L (ppb)
Naphthalene	<0.1
2-Methylnaphthalene	<0.1
1-Methylnaphthalene	<0.1
Benz(a)anthracene	<0.1
Chrysene	<0.1
Benzo(a)pyrene	<0.1
Benzo(b)fluoranthene	<0.1
Benzo(k)fluoranthene	<0.1
Indeno(1,2,3-cd)pyrene	<0.1
Dibenz(a,h)anthracene	<0.1

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	MW-2	Client:	Terracon
Date Received:	08/14/14	Project:	81127060, F&BI 408238
Date Extracted:	08/15/14	Lab ID:	408238-02 1/2
Date Analyzed:	08/15/14	Data File:	081524.D
Matrix:	Water	Instrument:	GCMS 10
Units:	ug/L (ppb)	Operator:	ya

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	94	50	150
Benzo(a)anthracene-d12	121	50	150

Compounds:	Concentration ug/L (ppb)
Naphthalene	<0.1
2-Methylnaphthalene	<0.1
1-Methylnaphthalene	<0.1
Benz(a)anthracene	<0.1
Chrysene	<0.1
Benzo(a)pyrene	<0.1
Benzo(b)fluoranthene	<0.1
Benzo(k)fluoranthene	<0.1
Indeno(1,2,3-cd)pyrene	<0.1
Dibenz(a,h)anthracene	<0.1

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	MW-4	Client:	Terracon
Date Received:	08/14/14	Project:	81127060, F&BI 408238
Date Extracted:	08/15/14	Lab ID:	408238-03 1/2
Date Analyzed:	08/15/14	Data File:	081525.D
Matrix:	Water	Instrument:	GCMS 10
Units:	ug/L (ppb)	Operator:	ya

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	96	50	150
Benzo(a)anthracene-d12	122	50	150

Compounds:	Concentration ug/L (ppb)
Naphthalene	<0.1
2-Methylnaphthalene	<0.1
1-Methylnaphthalene	<0.1
Benz(a)anthracene	<0.1
Chrysene	<0.1
Benzo(a)pyrene	<0.1
Benzo(b)fluoranthene	<0.1
Benzo(k)fluoranthene	<0.1
Indeno(1,2,3-cd)pyrene	<0.1
Dibenz(a,h)anthracene	<0.1

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	MW-1	Client:	Terracon
Date Received:	08/14/14	Project:	81127060, F&BI 408238
Date Extracted:	08/15/14	Lab ID:	408238-04 1/2
Date Analyzed:	08/15/14	Data File:	081526.D
Matrix:	Water	Instrument:	GCMS 10
Units:	ug/L (ppb)	Operator:	ya

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	93	50	150
Benzo(a)anthracene-d12	120	50	150

Compounds:	Concentration ug/L (ppb)
Naphthalene	<0.1
2-Methylnaphthalene	<0.1
1-Methylnaphthalene	<0.1
Benz(a)anthracene	<0.1
Chrysene	<0.1
Benzo(a)pyrene	<0.1
Benzo(b)fluoranthene	<0.1
Benzo(k)fluoranthene	<0.1
Indeno(1,2,3-cd)pyrene	<0.1
Dibenz(a,h)anthracene	<0.1

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	Method Blank	Client:	Terracon
Date Received:	Not Applicable	Project:	81127060, F&BI 408238
Date Extracted:	08/15/14	Lab ID:	04-1690 mb 1/2
Date Analyzed:	08/15/14	Data File:	081522.D
Matrix:	Water	Instrument:	GCMS 10
Units:	ug/L (ppb)	Operator:	ya

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	93	50	150
Benzo(a)anthracene-d12	110	50	150

Compounds:	Concentration ug/L (ppb)
Naphthalene	<0.1
2-Methylnaphthalene	<0.1
1-Methylnaphthalene	<0.1
Benz(a)anthracene	<0.1
Chrysene	<0.1
Benzo(a)pyrene	<0.1
Benzo(b)fluoranthene	<0.1
Benzo(k)fluoranthene	<0.1
Indeno(1,2,3-cd)pyrene	<0.1
Dibenz(a,h)anthracene	<0.1

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 08/20/14

Date Received: 08/14/14

Project: 81127060, F&BI 408238

**QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER
SAMPLES FOR BENZENE, TOLUENE, ETHYLBENZENE,
AND XYLENES
USING EPA METHOD 8021B**

Laboratory Code: 408212-01 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	RPD (Limit 20)
Benzene	ug/L (ppb)	<1	<1	nm
Toluene	ug/L (ppb)	<1	<1	nm
Ethylbenzene	ug/L (ppb)	<1	<1	nm
Xylenes	ug/L (ppb)	<3	<3	nm

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Benzene	ug/L (ppb)	50	90	65-118
Toluene	ug/L (ppb)	50	92	72-122
Ethylbenzene	ug/L (ppb)	50	89	73-126
Xylenes	ug/L (ppb)	150	91	74-118

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 08/20/14

Date Received: 08/14/14

Project: 81127060, F&BI 408238

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

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Diesel Extended	ug/L (ppb)	2,500	92	94	63-142	2

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 08/20/14

Date Received: 08/14/14

Project: 81127060, F&BI 408238

**QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER
SAMPLES FOR PNA'S BY EPA METHOD 8270D SIM**

Laboratory Code: Laboratory Control Sample

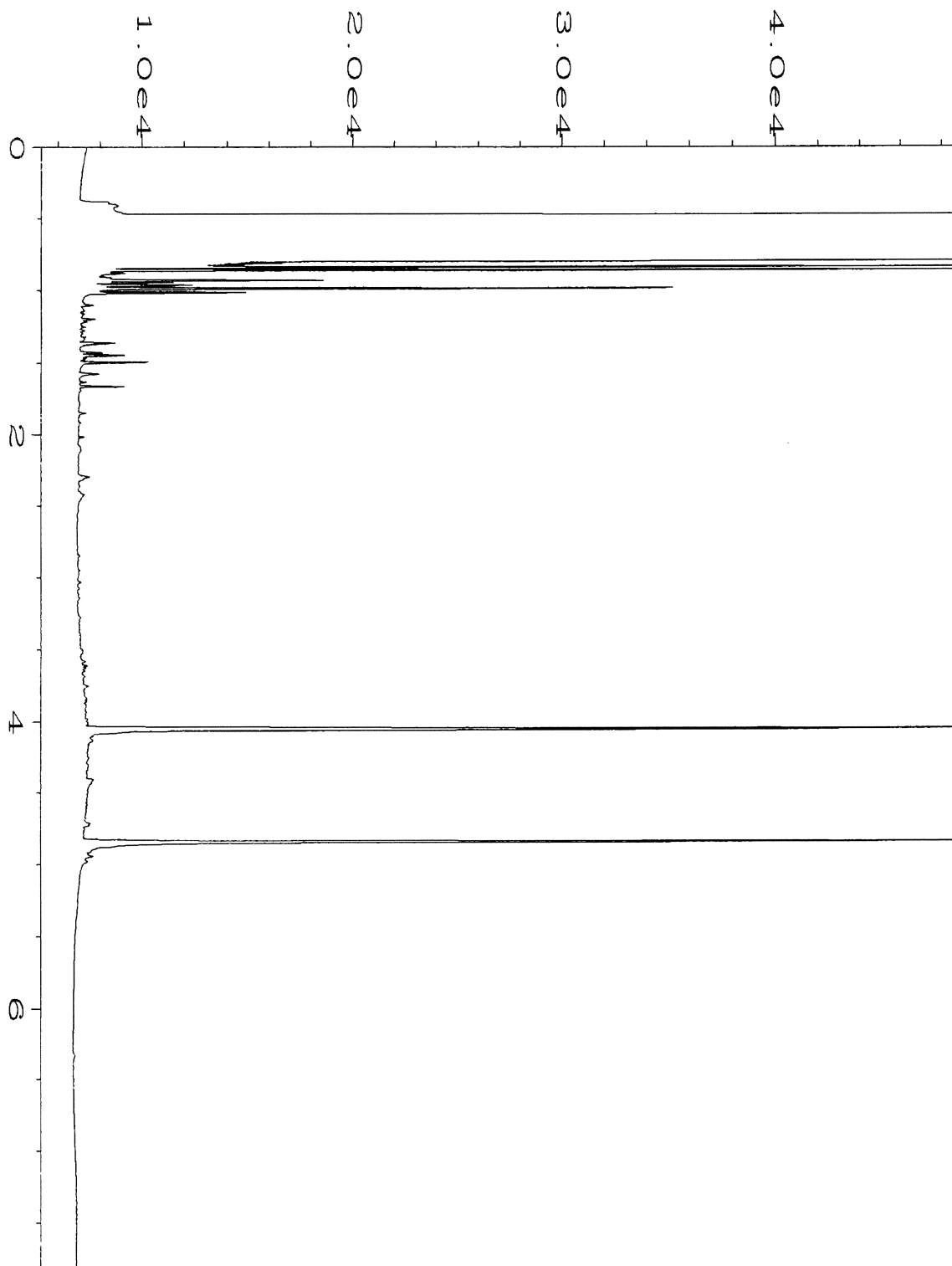
Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Naphthalene	ug/L (ppb)	1	93	94	70-130	1
2-Methylnaphthalene	ug/L (ppb)	1	99	100	70-130	1
1-Methylnaphthalene	ug/L (ppb)	1	93	94	70-130	1
Benz(a)anthracene	ug/L (ppb)	1	100	98	70-130	2
Chrysene	ug/L (ppb)	1	93	95	70-130	2
Benzo(b)fluoranthene	ug/L (ppb)	1	100	102	70-130	2
Benzo(k)fluoranthene	ug/L (ppb)	1	94	99	70-130	5
Benzo(a)pyrene	ug/L (ppb)	1	102	102	70-130	0
Indeno(1,2,3-cd)pyrene	ug/L (ppb)	1	86	79	70-130	8
Dibenz(a,h)anthracene	ug/L (ppb)	1	81	85	70-130	5

FRIEDMAN & BRUYA, INC.

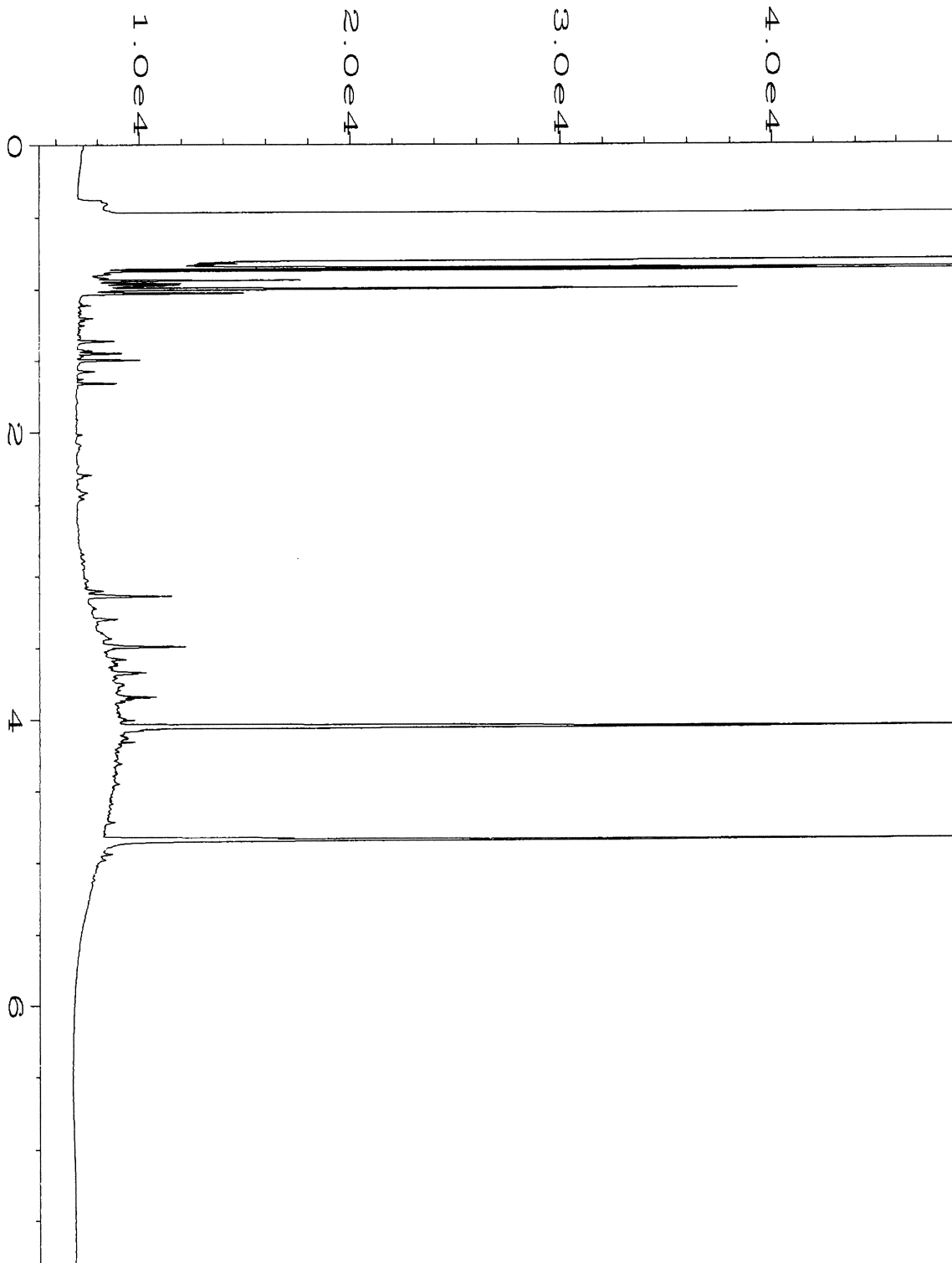
ENVIRONMENTAL CHEMISTS

Data Qualifiers & Definitions

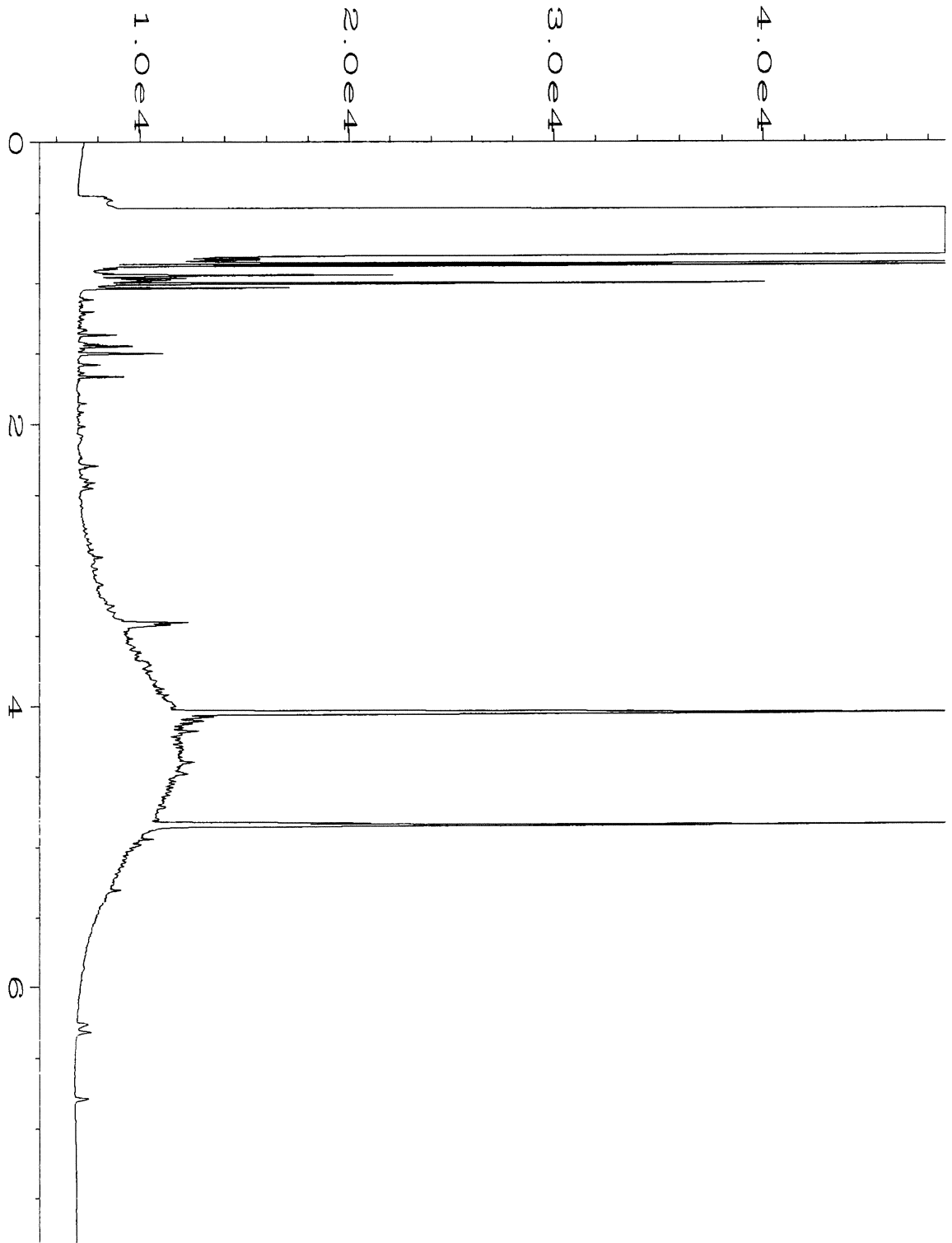
- a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.
- b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not 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.



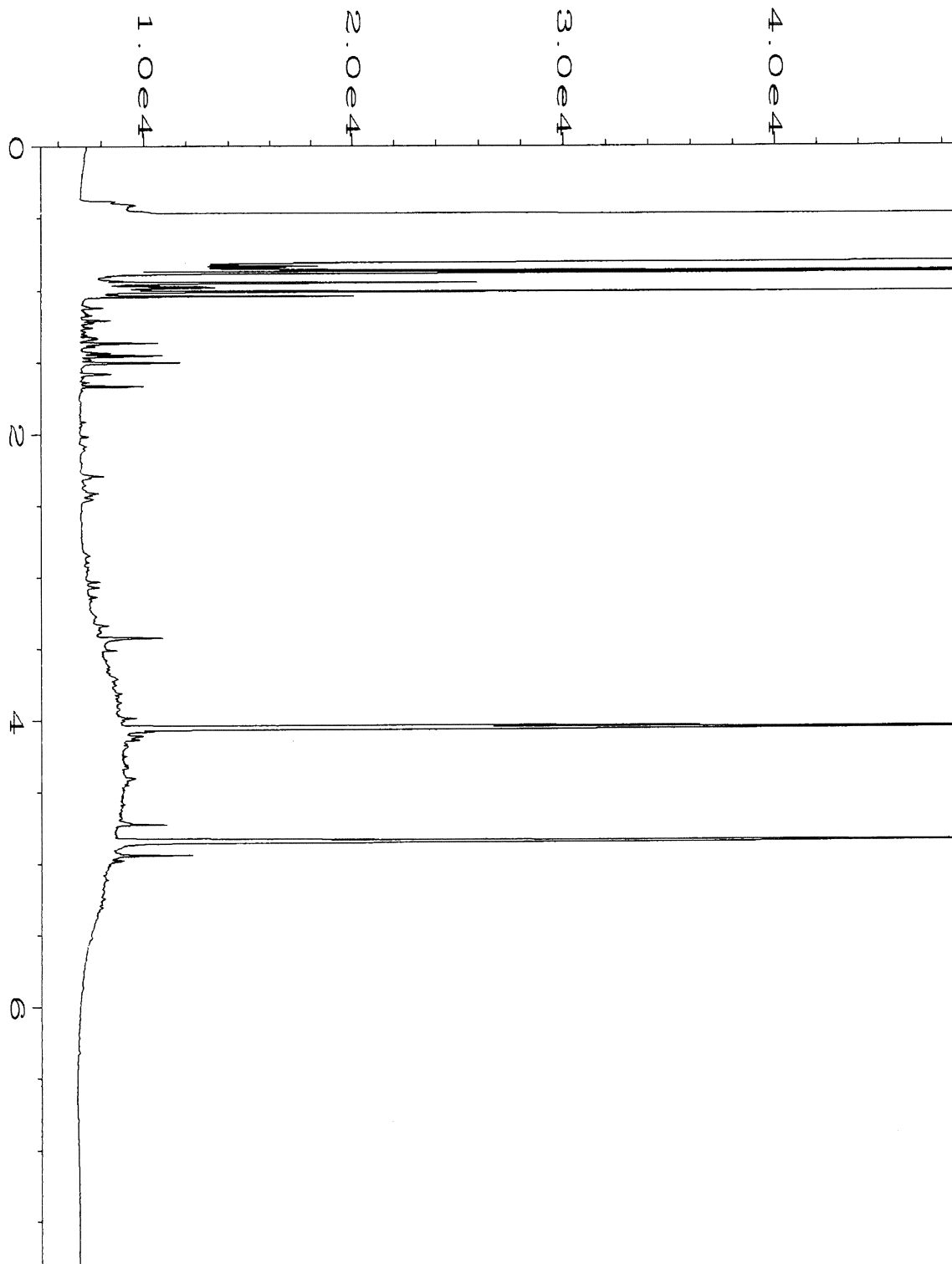
Data File Name	: C:\HPCHEM\1\DATA\08-15-14\045F0601.D	Page Number	: 1
Operator	: mwdl	Vial Number	: 45
Instrument	: GC1	Injection Number	: 1
Sample Name	: 408238-01	Sequence Line	: 6
Run Time Bar Code:		Instrument Method:	DX.MTH
Acquired on	: 15 Aug 14 07:16 PM	Analysis Method	: DX.MTH
Report Created on:	18 Aug 14 10:37 AM		



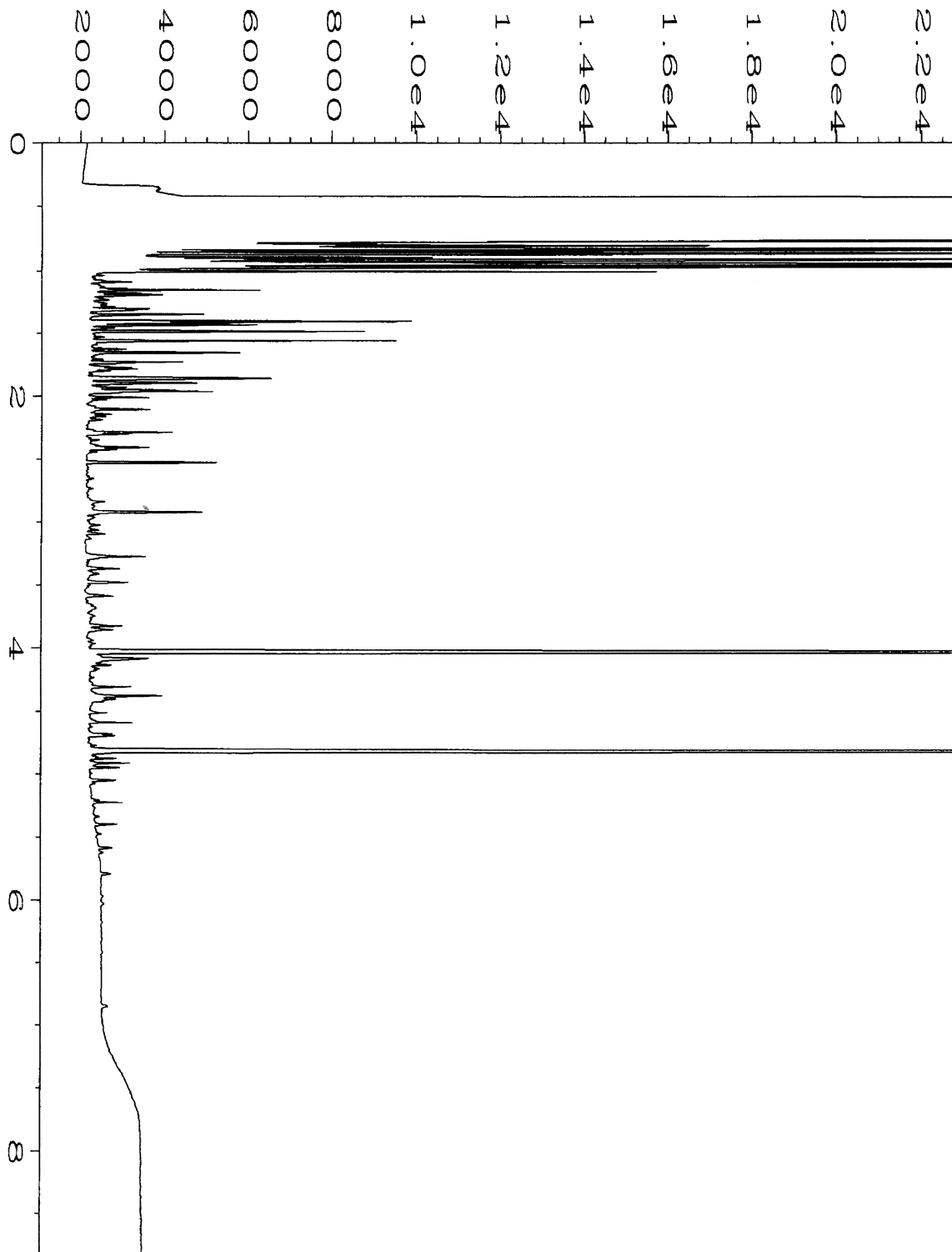
Data File Name	: C:\HPCHEM\1\DATA\08-15-14\046F0601.D	Page Number	: 1
Operator	: mwdl	Vial Number	: 46
Instrument	: GC1	Injection Number	: 1
Sample Name	: 408238-02	Sequence Line	: 6
Run Time Bar Code:		Instrument Method:	DX.MTH
Acquired on	: 15 Aug 14 07:29 PM	Analysis Method	: DX.MTH
Report Created on:	18 Aug 14 10:37 AM		



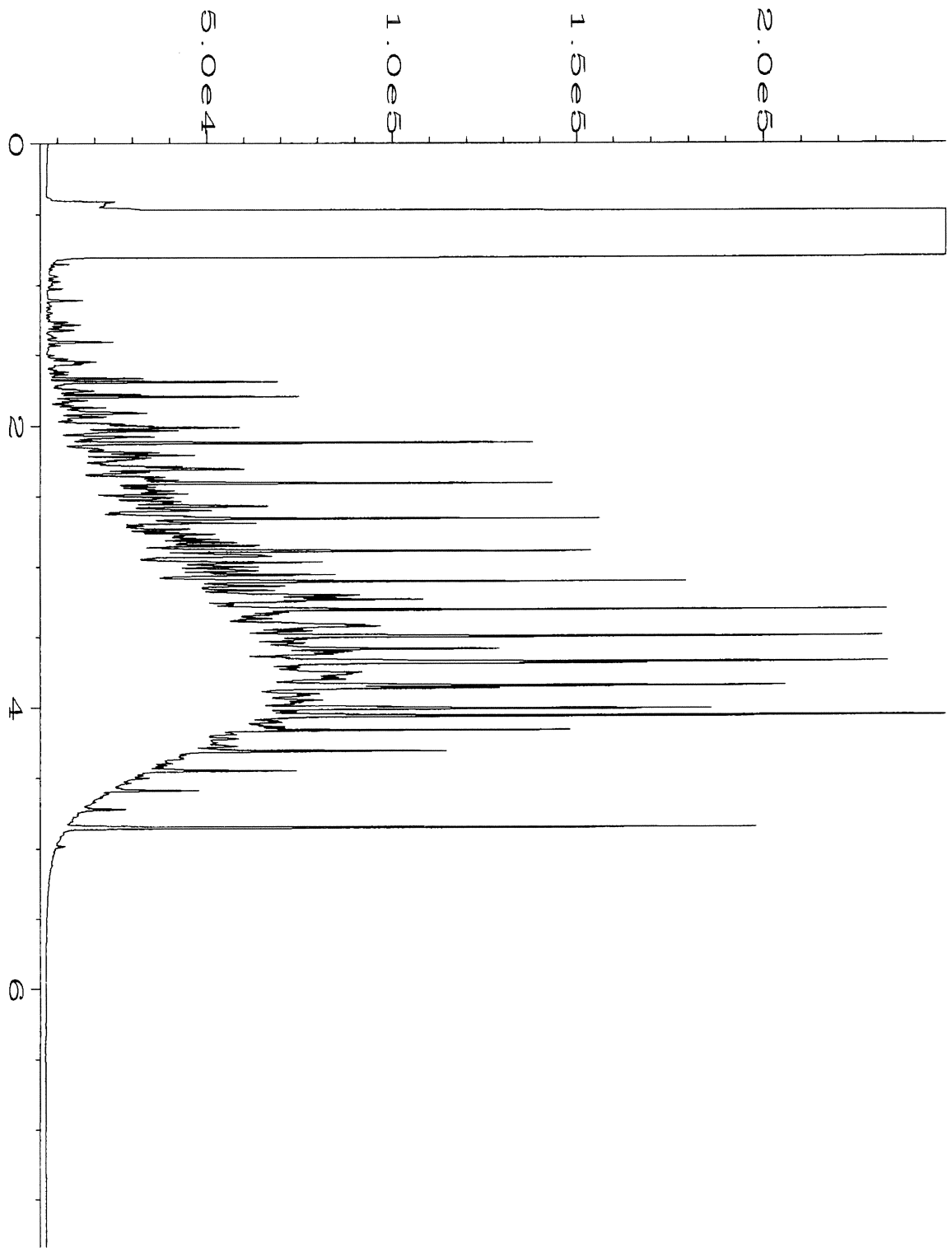
Data File Name	: C:\HPCHEM\1\DATA\08-15-14\047F0601.D	Page Number	: 1
Operator	: mwdl	Vial Number	: 47
Instrument	: GC1	Injection Number	: 1
Sample Name	: 408238-03	Sequence Line	: 6
Run Time Bar Code:		Instrument Method:	DX.MTH
Acquired on	: 15 Aug 14 07:42 PM	Analysis Method	: DX.MTH
Report Created on:	18 Aug 14 10:37 AM		



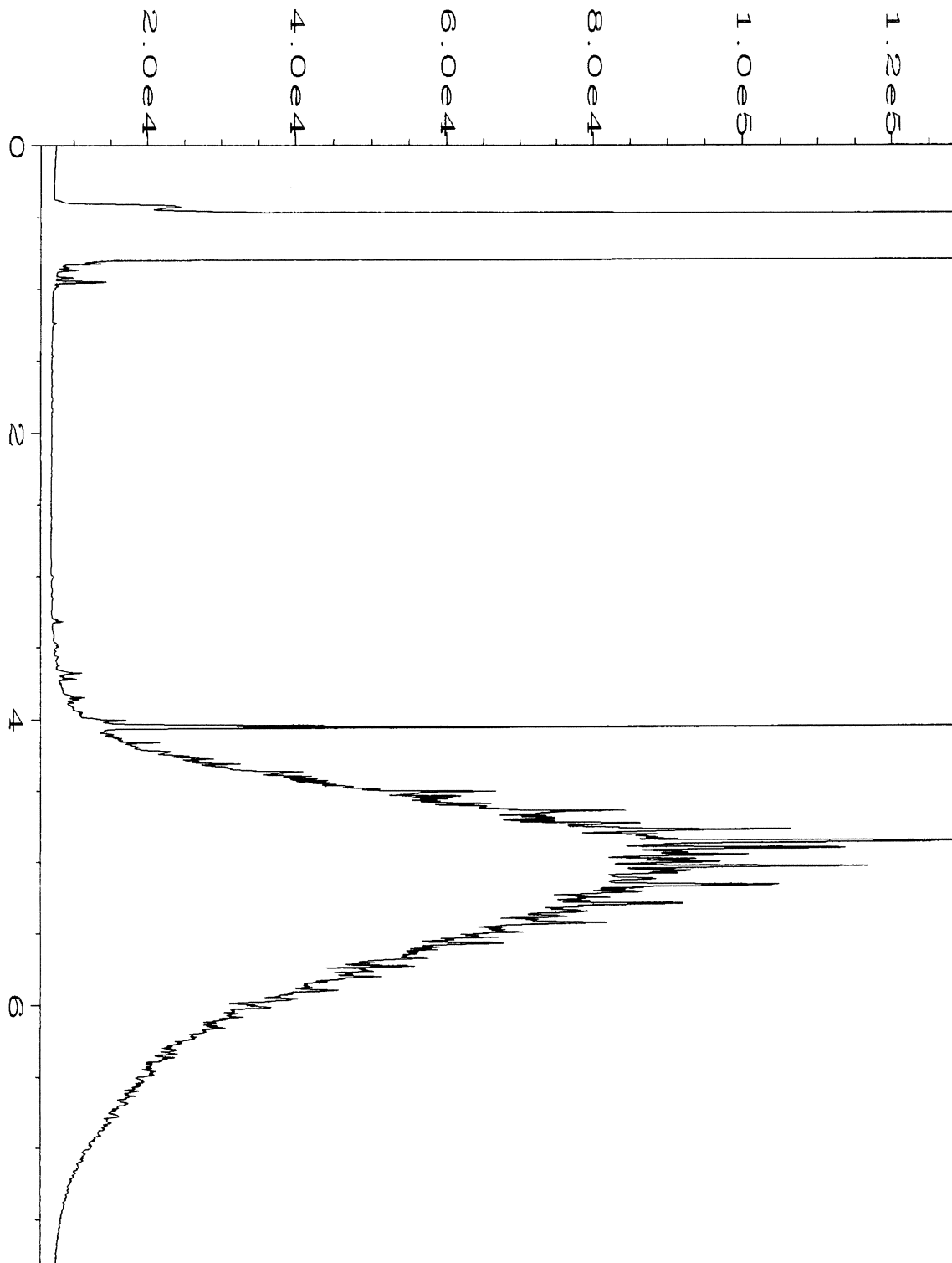
Data File Name	: C:\HPCHEM\1\DATA\08-15-14\048F0601.D	Page Number	: 1
Operator	: mwdl	Vial Number	: 48
Instrument	: GC1	Injection Number	: 1
Sample Name	: 408238-04	Sequence Line	: 6
Run Time Bar Code:		Instrument Method:	DX.MTH
Acquired on	: 15 Aug 14 07:55 PM	Analysis Method	: DX.MTH
Report Created on:	18 Aug 14 10:37 AM		



Data File Name	: C:\HPCHEM\4\DATA\08-15-14\019F0301.D	Page Number	: 1
Operator	: mwdl	Vial Number	: 19
Instrument	: GC#4	Injection Number	: 1
Sample Name	: 04-1670 mb2	Sequence Line	: 3
Run Time Bar Code:		Instrument Method:	DX.MTH
Acquired on	: 15 Aug 14 01:29 PM	Analysis Method	: DX.MTH
Report Created on:	18 Aug 14 10:30 AM		



Data File Name	: C:\HPCHEM\1\DATA\08-15-14\005F0501.D	Page Number	: 1
Operator	: mwdl	Vial Number	: 5
Instrument	: GC1	Injection Number	: 1
Sample Name	: 1000 Dx 43-133B	Sequence Line	: 5
Run Time Bar Code:		Instrument Method:	DX.MTH
Acquired on	: 15 Aug 14 03:21 PM	Analysis Method	: DX.MTH
Report Created on:	18 Aug 14 10:38 AM		



Data File Name	: C:\HPCHEM\1\DATA\08-15-14\004F0501.D	Page Number	: 1
Operator	: mwdl	Vial Number	: 4
Instrument	: GC1	Injection Number	: 1
Sample Name	: 1000 MO 43-24D	Sequence Line	: 5
Run Time Bar Code:		Instrument Method:	DX.MTH
Acquired on	: 15 Aug 14 02:55 PM	Analysis Method	: DX.MTH
Report Created on:	18 Aug 14 10:39 AM		

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

November 20, 2014

Eric A. Dubcak, Project Manager
Terracon
Pacific Cascade Building
21905 64th Ave. W., Suite 100
Mountlake Terrace, WA 98043

Dear Mr. Dubcak:

Included are the results from the testing of material submitted on November 13, 2014 from the Progress Rail 81127060, F&BI 411235 project. There are 12 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
TRC1120R.DOC

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

CASE NARRATIVE

This case narrative encompasses samples received on November 13, 2014 by Friedman & Bruya, Inc. from the Terracon Progress Rail 81127060, F&BI 411235 project. Samples were logged in under the laboratory ID's listed below.

<u>Laboratory ID</u>	<u>Terracon</u>
411235 -01	MW-3
411235 -02	MW-2
411235 -03	MW-4
411235 -04	MW-1

All quality control requirements were acceptable.

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 11/20/14
Date Received: 11/13/14
Project: Progress Rail 81127060, F&BI 411235
Date Extracted: 11/14/14
Date Analyzed: 11/14/14

**RESULTS FROM THE ANALYSIS OF WATER SAMPLES
FOR BENZENE, TOLUENE, ETHYLBENZENE, AND XYLENES
USING METHOD 8021B**

Results Reported as ug/L (ppb)

<u>Sample ID</u> Laboratory ID	<u>Benzene</u>	<u>Toluene</u>	<u>Ethyl Benzene</u>	<u>Total Xylenes</u>	<u>Surrogate (% Recovery)</u> Limit (52-124)
MW-3 411235-01	<1	<1	<1	<3	86
MW-2 411235-02	<1	<1	<1	<3	83
MW-4 411235-03	<1	<1	<1	<3	81
MW-1 411235-04	<1	<1	<1	<3	85
Method Blank 04-2287 MB	<1	<1	<1	<3	85

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 11/20/14
Date Received: 11/13/14
Project: Progress Rail 81127060, F&BI 411235
Date Extracted: 11/14/14
Date Analyzed: 11/14/14

**RESULTS FROM THE ANALYSIS OF WATER SAMPLES
FOR TOTAL PETROLEUM HYDROCARBONS AS
DIESEL AND MOTOR OIL
USING METHOD NWTPH-Dx**
Results Reported as ug/L (ppb)

<u>Sample ID</u> Laboratory ID	<u>Diesel Range</u> (C ₁₀ -C ₂₅)	<u>Motor Oil Range</u> (C ₂₅ -C ₃₆)	<u>Surrogate</u> <u>(% Recovery)</u> (Limit 41-152)
MW-3 411235-01	<50	<250	99
MW-2 411235-02	190 x	<250	99
MW-4 411235-03	300 x	<250	93
MW-1 411235-04	240 x	<250	102
Method Blank 04-2307 MB2	<50	<250	95

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	MW-3	Client:	Terracon
Date Received:	11/13/14	Project:	Progress Rail 81127060, F&BI 411235
Date Extracted:	11/18/14	Lab ID:	411235-01 1/2
Date Analyzed:	11/19/14	Data File:	111906.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	93	50	150
Benzo(a)anthracene-d12	104	50	129

Compounds:	Concentration ug/L (ppb)
Naphthalene	<0.1
2-Methylnaphthalene	<0.1
1-Methylnaphthalene	<0.1
Benzo(a)anthracene	<0.1
Chrysene	<0.1
Benzo(a)pyrene	<0.1
Benzo(b)fluoranthene	<0.1
Benzo(k)fluoranthene	<0.1
Indeno(1,2,3-cd)pyrene	<0.1
Dibenz(a,h)anthracene	<0.1

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	MW-2	Client:	Terracon
Date Received:	11/13/14	Project:	Progress Rail 81127060, F&BI 411235
Date Extracted:	11/18/14	Lab ID:	411235-02 1/2
Date Analyzed:	11/19/14	Data File:	111907.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	92	50	150
Benzo(a)anthracene-d12	97	50	129

Compounds:	Concentration ug/L (ppb)
Naphthalene	<0.1
2-Methylnaphthalene	<0.1
1-Methylnaphthalene	<0.1
Benzo(a)anthracene	<0.1
Chrysene	<0.1
Benzo(a)pyrene	<0.1
Benzo(b)fluoranthene	<0.1
Benzo(k)fluoranthene	<0.1
Indeno(1,2,3-cd)pyrene	<0.1
Dibenz(a,h)anthracene	<0.1

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	MW-4	Client:	Terracon
Date Received:	11/13/14	Project:	Progress Rail 81127060, F&BI 411235
Date Extracted:	11/18/14	Lab ID:	411235-03 1/2
Date Analyzed:	11/19/14	Data File:	111908.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	95	50	150
Benzo(a)anthracene-d12	104	50	129

Compounds:	Concentration ug/L (ppb)
Naphthalene	<0.1
2-Methylnaphthalene	<0.1
1-Methylnaphthalene	<0.1
Benzo(a)anthracene	<0.1
Chrysene	<0.1
Benzo(a)pyrene	<0.1
Benzo(b)fluoranthene	<0.1
Benzo(k)fluoranthene	<0.1
Indeno(1,2,3-cd)pyrene	<0.1
Dibenz(a,h)anthracene	<0.1

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	MW-1	Client:	Terracon
Date Received:	11/13/14	Project:	Progress Rail 81127060, F&BI 411235
Date Extracted:	11/18/14	Lab ID:	411235-04 1/2
Date Analyzed:	11/19/14	Data File:	111909.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	95	50	150
Benzo(a)anthracene-d12	103	50	129

Compounds:	Concentration ug/L (ppb)
Naphthalene	<0.1
2-Methylnaphthalene	<0.1
1-Methylnaphthalene	<0.1
Benz(a)anthracene	<0.1
Chrysene	<0.1
Benzo(a)pyrene	<0.1
Benzo(b)fluoranthene	<0.1
Benzo(k)fluoranthene	<0.1
Indeno(1,2,3-cd)pyrene	<0.1
Dibenz(a,h)anthracene	<0.1

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	Method Blank	Client:	Terracon
Date Received:	Not Applicable	Project:	Progress Rail 81127060, F&BI 411235
Date Extracted:	11/18/14	Lab ID:	04-2349 mb 1/2
Date Analyzed:	11/19/14	Data File:	111905.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	97	50	150
Benzo(a)anthracene-d12	108	50	129

Compounds:	Concentration ug/L (ppb)
Naphthalene	<0.1
2-Methylnaphthalene	<0.1
1-Methylnaphthalene	<0.1
Benz(a)anthracene	<0.1
Chrysene	<0.1
Benzo(a)pyrene	<0.1
Benzo(b)fluoranthene	<0.1
Benzo(k)fluoranthene	<0.1
Indeno(1,2,3-cd)pyrene	<0.1
Dibenz(a,h)anthracene	<0.1

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 11/20/14

Date Received: 11/13/14

Project: Progress Rail 81127060, F&BI 411235

**QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER
SAMPLES FOR BENZENE, TOLUENE, ETHYLBENZENE,
AND XYLENES
USING EPA METHOD 8021B**

Laboratory Code: 411235-01 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	RPD (Limit 20)
Benzene	ug/L (ppb)	<1	<1	nm
Toluene	ug/L (ppb)	<1	<1	nm
Ethylbenzene	ug/L (ppb)	<1	<1	nm
Xylenes	ug/L (ppb)	<3	<3	nm

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Benzene	ug/L (ppb)	50	96	65-118
Toluene	ug/L (ppb)	50	95	72-122
Ethylbenzene	ug/L (ppb)	50	98	73-126
Xylenes	ug/L (ppb)	150	93	74-118

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 11/20/14

Date Received: 11/13/14

Project: Progress Rail 81127060, F&BI 411235

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

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Diesel Extended	ug/L (ppb)	2,500	92	99	63-142	7

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 11/20/14

Date Received: 11/13/14

Project: Progress Rail 81127060, F&BI 411235

**QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER
SAMPLES FOR PNA'S BY EPA METHOD 8270D SIM**

Laboratory Code: Laboratory Control Sample

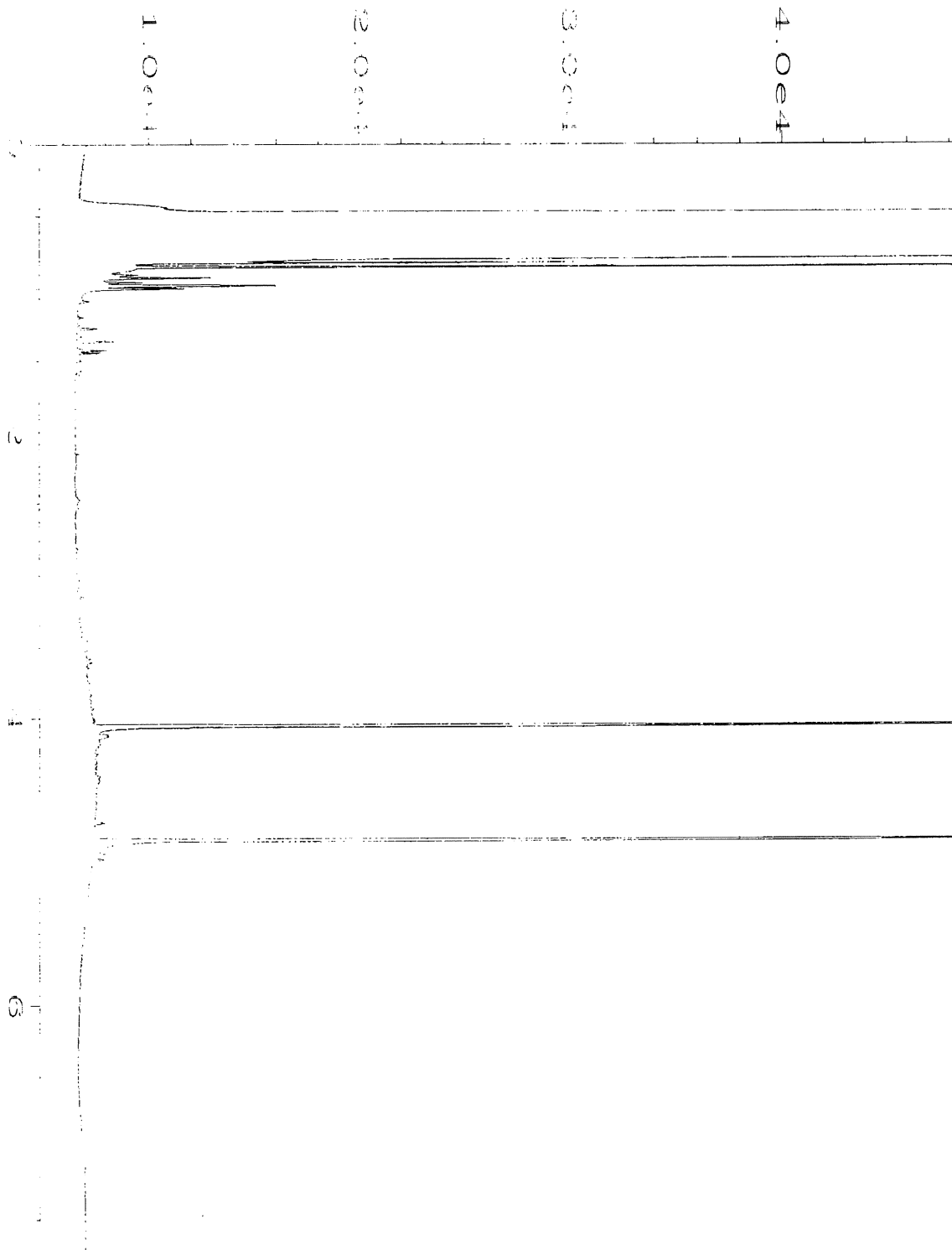
Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Naphthalene	ug/L (ppb)	1	91	92	67-116	1
2-Methylnaphthalene	ug/L (ppb)	1	92	94	63-122	2
1-Methylnaphthalene	ug/L (ppb)	1	93	94	65-122	1
Benz(a)anthracene	ug/L (ppb)	1	98	97	60-118	1
Chrysene	ug/L (ppb)	1	95	98	66-125	3
Benzo(b)fluoranthene	ug/L (ppb)	1	107	106	55-135	1
Benzo(k)fluoranthene	ug/L (ppb)	1	105	108	62-125	3
Benzo(a)pyrene	ug/L (ppb)	1	107	108	58-127	1
Indeno(1,2,3-cd)pyrene	ug/L (ppb)	1	105	107	36-142	2
Dibenz(a,h)anthracene	ug/L (ppb)	1	87	95	37-133	9

FRIEDMAN & BRUYA, INC.

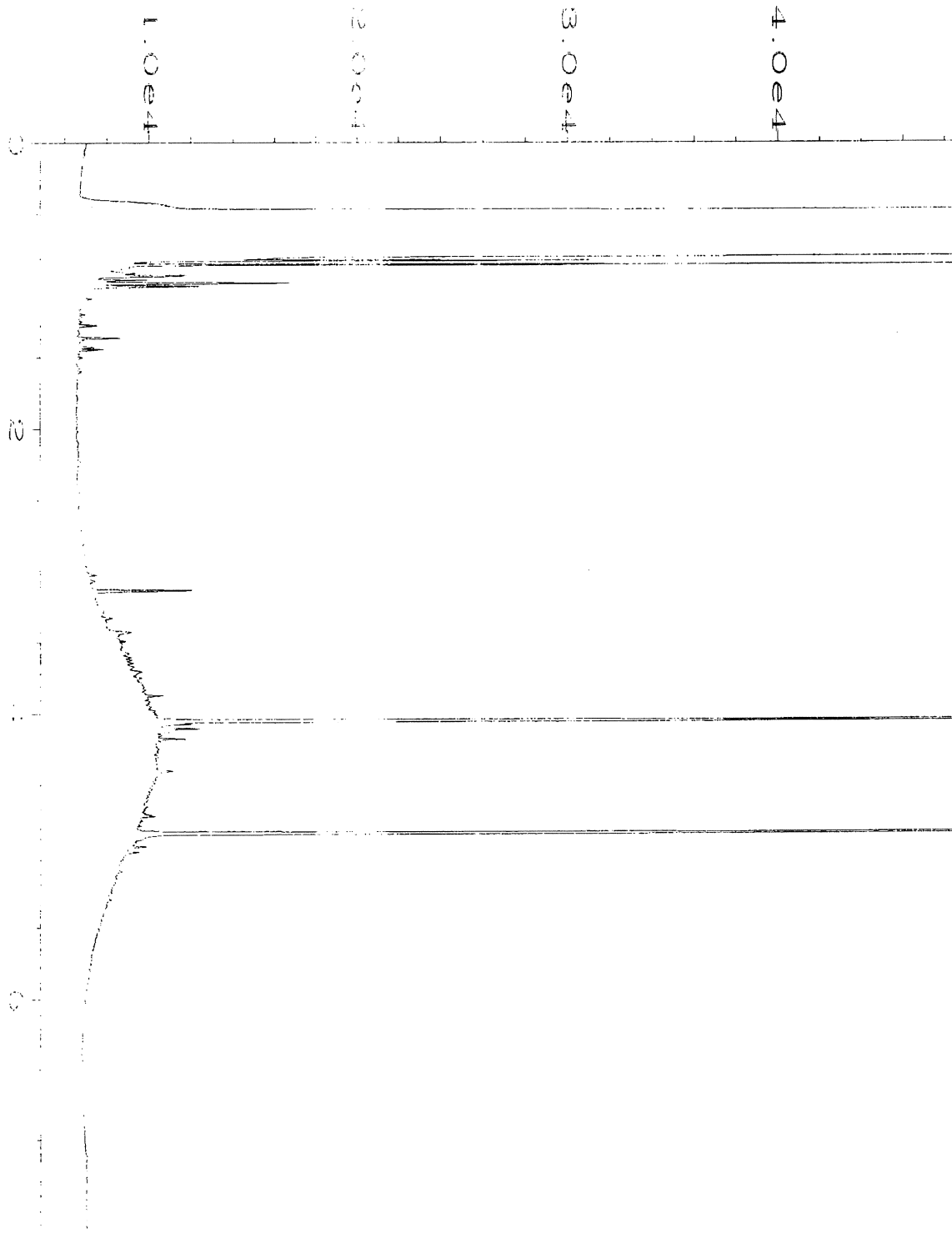
ENVIRONMENTAL CHEMISTS

Data Qualifiers & Definitions

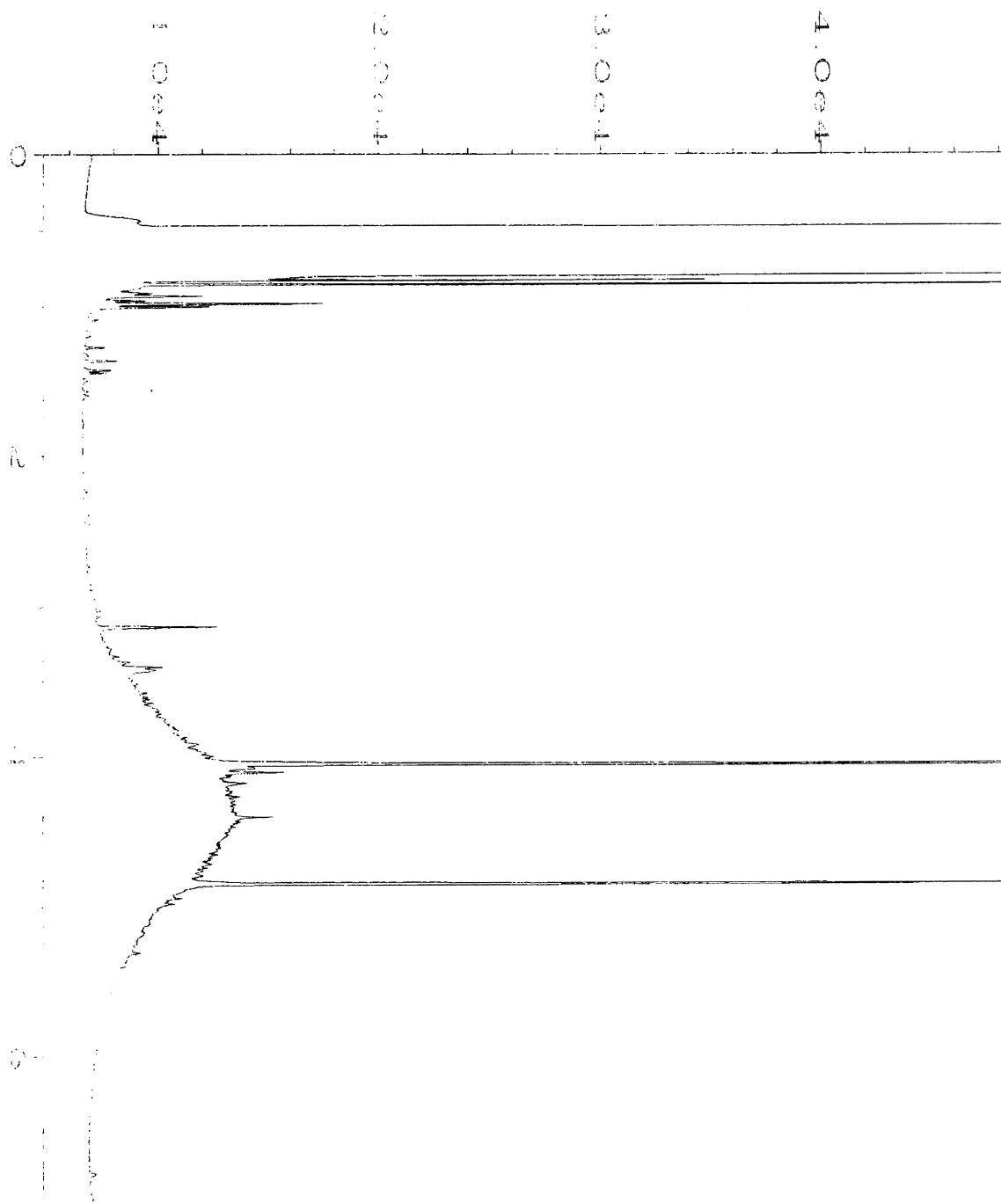
- a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.
- b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not 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.



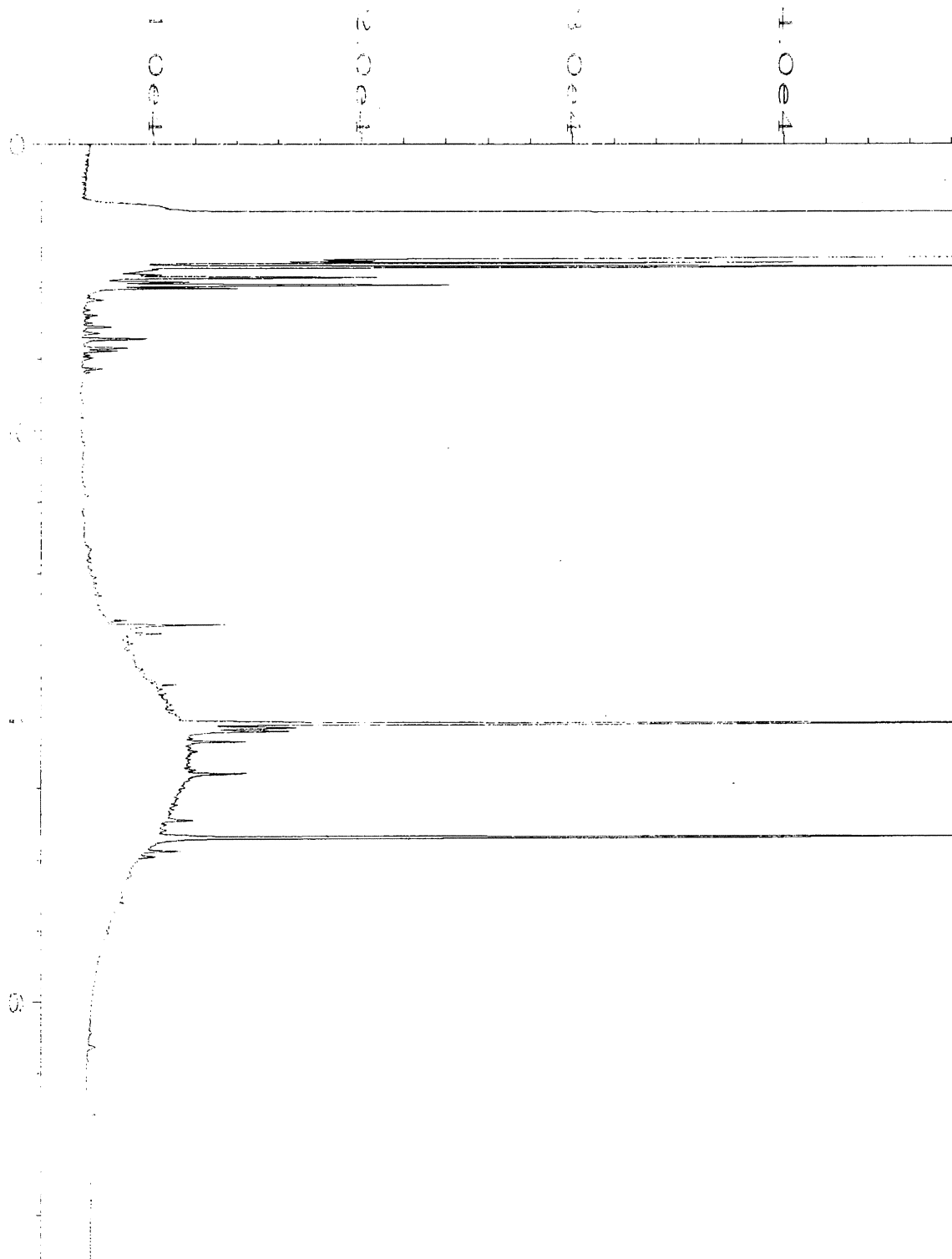
Data File Name	: C:\HPCHEM\1\DATA\11-14-14\032F0501.D	Page Number	: 1
Operator	: mwdl	Vial Number	: 32
Instrument	: GC1	Injection Number	: 1
Sample Name	: 411235-01	Sequence Line	: 5
Run Time Bar Code:		Instrument Method:	DX.MTH
Acquired on	: 14 Nov 14 04:34 PM	Analysis Method	: END.MTH
Report Created on:	17 Nov 14 09:14 AM		



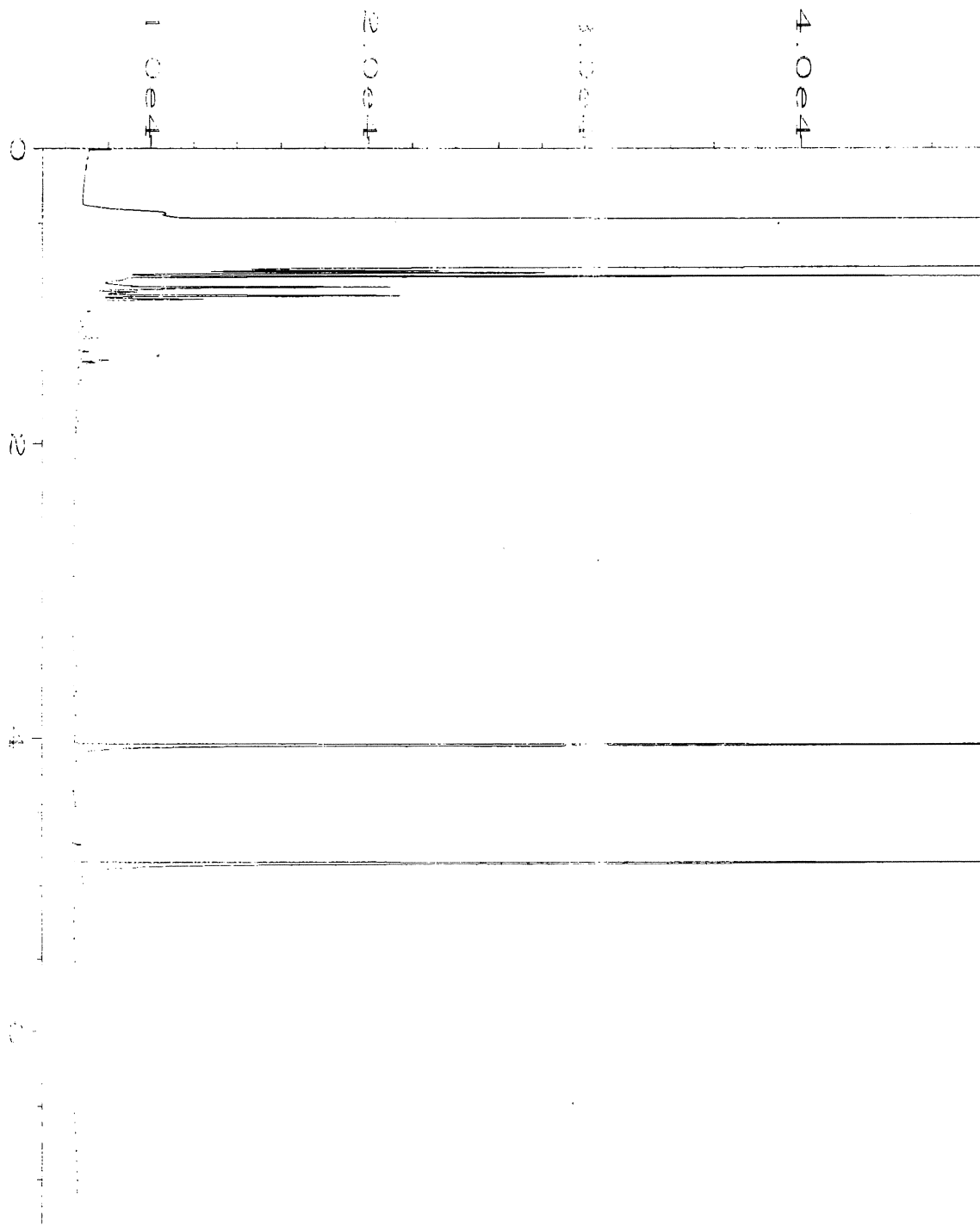
Data File Name	: C:\HPCHEM\1\DATA\11-14-14\033F0501.D	Page Number	: 1
Operator	: mwdl	Vial Number	: 33
Instrument	: GC1	Injection Number	: 1
Sample Name	: 411235-02	Sequence Line	: 5
Run Time Bar Code:		Instrument Method:	DX.MTH
Acquired on	: 14 Nov 14 04:46 PM	Analysis Method	: END.MTH
Report Created on:	17 Nov 14 09:14 AM		



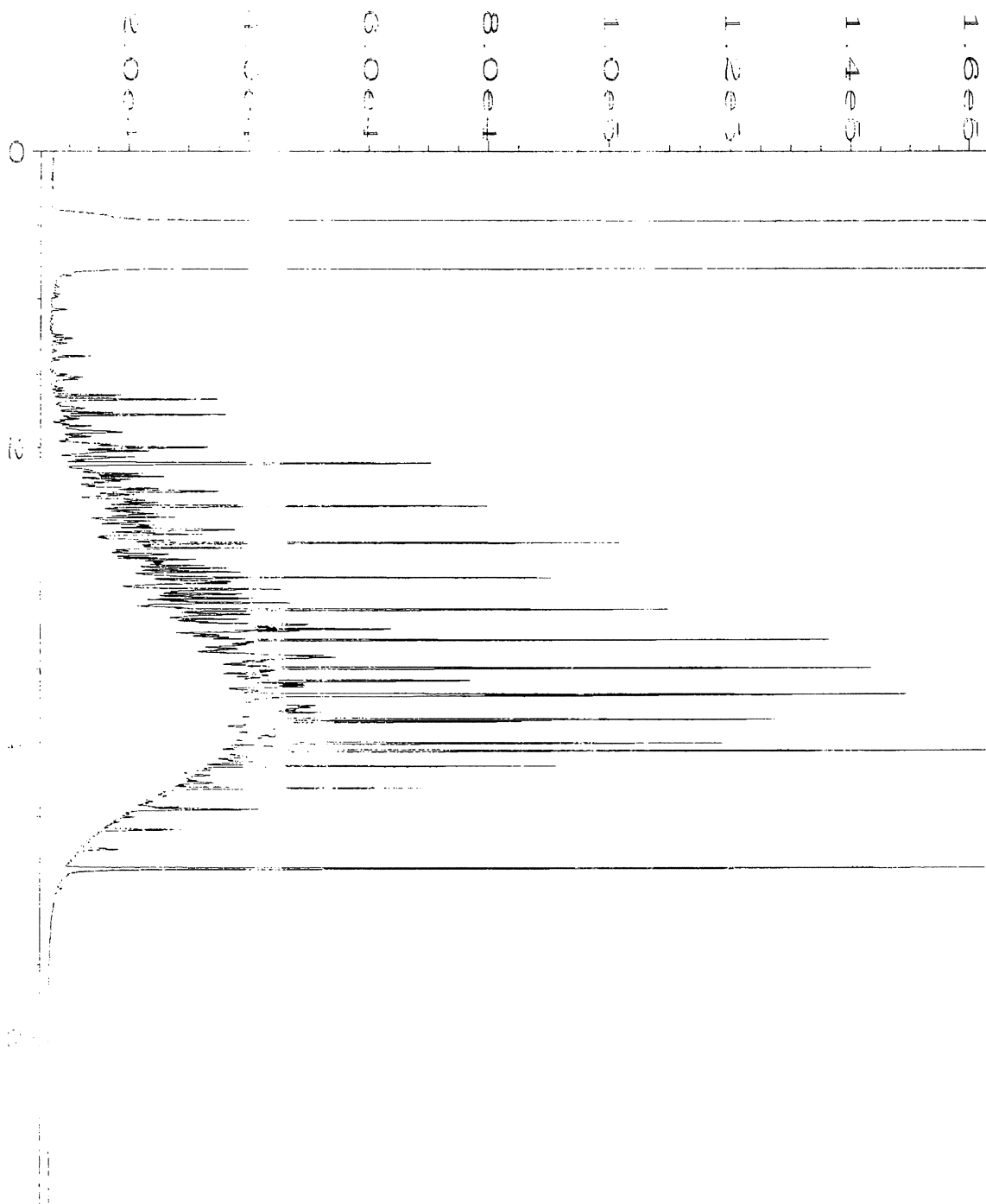
Data File Name	: C:\HPCHEM\1\DATA\11-14-14\034F0501.D	Page Number	: 1
Operator	: mwdl	Vial Number	: 34
Instrument	: GC1	Injection Number	: 1
Sample Name	: 411235-03	Sequence Line	: 5
Run Time Bar Code:		Instrument Method:	DX.MTH
Acquired on	: 14 Nov 14 04:58 PM	Analysis Method	: END.MTH
Report Created on:	17 Nov 14 09:14 AM		



Data File Name	: C:\HPCHEM\1\DATA\11-14-14\035F0501.D	Page Number	: 1
Operator	: mwdl	Vial Number	: 35
Instrument	: GC1	Injection Number	: 1
Sample Name	: 411235-04	Sequence Line	: 5
Run Time Bar Code:		Instrument Method:	DX.MTH
Acquired on	: 14 Nov 14 05:11 PM	Analysis Method	: END.MTH
Report Created on:	17 Nov 14 09:14 AM		



Data File Name	: C:\HPCHEM\1\DATA\11-14-14\023F0501.D	Page Number	: 1
Operator	: mwdl	Vial Number	: 23
Instrument	: GC1	Injection Number	: 1
Sample Name	: 04-2307 mb2	Sequence Line	: 5
Run Time Bar Code:		Instrument Method:	DX.MTH
Acquired on	: 14 Nov 14 02:45 PM	Analysis Method	: END.MTH
Report Created on:	17 Nov 14 09:14 AM		



Data File Name	: C:\HPCHEM\1\DATA\11-14-14\003F0201.D	Page Number	: 1
Operator	: mwdl	Vial Number	: 3
Instrument	: GC1	Injection Number	: 1
Sample Name	: 500 Dx 43-199B	Sequence Line	: 2
Run Time Bar Code:		Instrument Method:	DX.MTH
Acquired on	: 14 Nov 14 09:10 AM	Analysis Method	: END.MTH
Report Created on:	17 Nov 14 09:14 AM		

SAMPLE CHAIN OF CUSTODY

ME 11-13-14

12/1/05

411935

Send Report To Eric Duback

Company Terracon

Address 21905 64th Ave. W suite 100

City, State, ZIP Northlake Terrace, WA 98043

Phone # 425-771-3304 Fax # _____

SAMPLERS (signature) [Signature]

PROJECT NAME/NO. Progress Rail

PO#

8th & 7060

REMARKS

Page # 1 of 1

TURNAROUND TIME

Standard (2 Weeks)

RUSH

Rush charges authorized by _____

SAMPLE DISPOSAL

Dispose after 30 days

Return samples

Will call with instructions

ANALYSES REQUESTED

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of containers	ANALYSES REQUESTED							Notes
						TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by 8260	SVOcs by 8270	HFS	CPAHs	
MW-3	01	11/13/14	10:56	GW	5	X	X	X			X	X	
MW-2	03	11/13/14	11:38	GW	5	X	X	X			X	X	
MW-4	03	11/13/14	12:24	GW	5	X	X	X			X	X	
MW-1	04	11/13/14	13:09	GW	5	X	X	X			X	X	

Samples received at _____ °C

SIGNATURE

Relinquished by: [Signature]

PRINT NAME

S. Kyle Long

COMPANY

Terracon

DATE

11/13/14

TIME

3:22

Received by: [Signature]

Shawn Phelan

TR&T

11/13/14

3:22

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