



April 9, 2020

Fred White  
Reserve Silica Corp.  
28131 SE Ravensdale Way  
Ravensdale, WA 980514

**Re: March 2020 Fuel Spill Response and Cleanup**  
Reserve Silica Corp., Ravensdale, Washington  
Project No. 160315

Dear Fred:

This report documents the results of the cleanup completed at the Reserve Silica facility located in Ravensdale, Washington, to address diesel spilled to the ground surface after a dump truck went into a ditch at the facility on Thursday, March 5, 2020. The cleanup was conducted in accordance with Washington State Model Toxics Control Act (MTCA; Chapter 173-340 of the Washington Administrative Code [WAC]). The cleanup resulted in the removal of liquid diesel and soil containing concentrations of diesel-range hydrocarbons above the MTCA Method A cleanup level for unrestricted land use. This report describes the spill, provides information about the initial response, and presents a detailed description of the cleanup activities performed and their results. Photos of the spill, response, and cleanup are included in Attachment A.

## **Spill Location and Response**

On Thursday, March 5, 2020, at approximately 3:30 p.m., a truck overloaded with saturated soil was turned away from the dumpsite for noncompliance with the landfill operating permit and lost its brakes coming down the hill and crashed into the stormwater ditch at the bottom of the hill. The property location is shown on Figure 1 and the location of the crash and spill are depicted on Figure 2. The fuel line on the truck was ruptured on impact and spilled an estimated 25 to 50 gallons of diesel fuel onto the ground surface. Reserve Silica quickly deployed spill control measures, including absorbent socks and pads, and then made the required spill notifications. Trevor Braund, with the Washington State Department of Ecology (Ecology) Spill Preparedness and Response Program, responded to the spill report and was at the location of the spill at approximately 6:30 p.m. Reserve Silica and Ecology personnel placed additional absorbent materials around the truck to prevent diesel from reaching surface water in the stormwater ditch.

On Friday, March 6, 2020, an Aspect field geologist was on-site with Reserve Silica personnel and Ecology spill responder Andy Quast to observe removal of the truck from the ditch, evaluate the extent of the spill and develop a cleanup approach. The truck crashed into a ditch at the intersection of two haul roads at the facility, both of which lead uphill to the dumpsite. The stormwater ditch collects surface water runoff alongside the roads, which flows together into a culvert that extends beneath the road and discharges to the ground surface on the west side of the road (Figure 2).

The stormwater ditch has been mostly filled over time with loose, soft, and saturated fine-grained sediments, consisting primarily of clay, silt and fine sand, but also including asphalt gravel.<sup>1</sup> The initial impact of the crash created a berm of soil at the front of the truck, next to the inlet to the culvert, which prevented any of the spilled diesel from getting into surface water. Prior to removal of the truck, a temporary overflow dam was constructed, consisting of piping, sandbags and soil berms, to ensure that diesel did not get into stormwater during or following removal of the truck from the ditch. The truck was removed from the ditch at approximately 2:45 pm. Ecology assessed the situation and determined that none of the diesel had reached stormwater or surface water and, after making this conclusion, departed the spill site at approximately 3:05 pm.

## Spill Cleanup

Cleanup work was conducted on March 6, 7, and 12, 2020. Initially, a vacuum truck was used to remove liquid diesel, ponded surface water and impacted ditch sediments. Subsequently, an excavator was used to remove soil to the west of the stormwater ditch, which consists primarily of densely consolidated sand and gravel, including cobbles that are more than a foot in diameter, but also includes asphalt gravel. Throughout the cleanup work, soil was field screened for the presence of contamination using a photoionization detector (PID), water sheen testing, and observation for odors and staining. Excavation continued where field indicators of contamination—consisting of visible liquid diesel, heavy sheen, and/or strong petroleum-like odors—were noted in soil. Once field screening results no longer identified these field indicators, soil samples were collected from the sidewalls and base of the excavation. The laboratory analytical results of those soil samples, as discussed in the following section, were used to confirm that no further cleanup work was necessary.

## Cleanup Results

A total of 1,600 gallons of diesel and water and 32 tons of diesel-impacted soil was removed and transported off the site by vacuum trucks from ProVac Clean Services to PRS in Tacoma, Washington, for sampling, profiling, and disposal. A visual inspection of the spill site confirms that all liquid diesel was recovered. In addition, the results of five sidewall and two base confirmation soil samples indicate that soil with concentrations of diesel-range hydrocarbons exceeding the MTCA Method A cleanup level has been removed from the spill site (Table 1). The final lateral extent of the excavation is depicted on Figure 2. The excavation was approximately 2 to 2.5 feet deep in the stormwater ditch, and slightly deeper to the west, with total depths of approximately 2.5 to 3 feet. The analytical data for performance and confirmation soil samples collected during the cleanup are summarized in Table 1. The full laboratory analytical reports, including chromatograms, are provided in Attachment B.

Sidewall samples collected from the ditch sediments on the northeast end of the excavation (SW-1 and SW-2; Figure 2) contained concentrations of motor oil-range hydrocarbons above the MTCA Method A cleanup level (Table 1). The laboratory chemist reviewed the chromatograms for these samples and indicated that they contained a motor-oil component that is typical of asphalt, and did not contain diesel (x-flagged results reported in the diesel range are overlap from the motor

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<sup>1</sup> The gravels are recycled asphalt pavement (RAP), a loose, granular byproduct of asphalt recycling that is commonly used as roadway base and fill material in road construction and preservation projects in accordance with Washington State Department of Transportation rules and guidelines. RAP has been used in road construction at the Reserve Silica facility.

oil-range hydrocarbons present in the samples). To confirm that the asphalt aggregate in the ditch sediments is the source of the motor oil-range hydrocarbons, a sample of ditch sediment was collected uphill of the spill from a depth of 1 foot below the ground surface. The laboratory results detected the same motor oil-range hydrocarbons in the uphill ditch sediment sample (Table 1).

A sample of stormwater discharging from the west end of the culvert was collected on March 12, 2020, for laboratory analysis. The results did not detect diesel- or motor oil-range hydrocarbons above the laboratory reporting limits. The laboratory report is provided in Attachment B.

## **Conclusions**

A total of 1,600 gallons of diesel and water and 32 tons of diesel-impacted soil was removed from the spill site between March 6 and 12, 2020. The results of soil samples collected at the limits of the cleanup excavation confirm that diesel-contaminated soil has been removed from the spill site and that no further action is necessary. The spill did not reach surface water and the results of a water sample collected at the discharge point on the stormwater culvert did not contain petroleum hydrocarbons above laboratory detection limits.

## **Limitations**

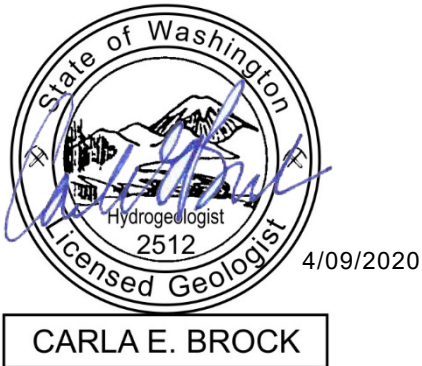
Work for this project was performed for Reserve Silica (Client), and this letter was prepared in accordance with generally accepted professional practices for the nature and conditions of work completed in the same or similar localities, at the time the work was performed. This letter does not represent a legal opinion. No other warranty, expressed or implied, is made.

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**Please refer to Attachment C titled "Report Limitations and Guidelines for Use" for additional information governing the use of this report.**

Sincerely,

**Aspect consulting, LLC**



**Carla Brock, LHG**  
Associate Geologist  
cbrock@aspectconsulting.com

**Kristin Beck, GIT**  
Project Geologist  
kbeck@aspectconsulting.com

Attachments: Table 1 –Soil Analytical Data  
Figure 1 – Property Location Map  
Figure 2 – Spill Response Map  
Attachment A – Photo Log  
Attachment B – Laboratory Analytical Reports  
Attachment C – Report Limitations and Guidelines for Use

V:\160315 Reserve Silica - RIFS\Deliverables\Fuel Spill Report\Fuel Spill Response Report\_Apr2020.docx

# TABLE

## Table 1. Soil Analytical Data

Project 160315, Reserve Silica 2020 Fuel Spill Response, Ravensdale, WA

Sample Location	Sample ID	Sample Date	Sample Depth (feet bgs) <sup>1</sup>	Total Petroleum Hydrocarbons		Notes
				Diesel-Range	Motor Oil-Range	
Performance Samples						
n/a	B-0-030620	3/6/2020	n/a	6,200	4,600	Source sample from ground surface in ditch, sample was over-excavated, combination of diesel and motor oil
B-2	B-2-030720	3/7/2020	2	3,600	390 x	Diesel only, sample was over-excavated on 3/12/2020
SW-4	SW-4-030720	3/7/2020	1.5	7,600	<250	Sample was over-excavated on same day (diesel only)
Confirmation Samples						
B-1	B-1-030620	3/6/2020	2.5	<50	770	Motor oil only, indicative of asphalt
B-3	B-3	3/12/2020	2.75	<50	<250	
SW-1	SW-1-030620	3/6/2020	1.5	330 x	3,100	Motor oil only, indicative of asphalt
SW-2	SW-2-030620	3/6/2020	1.5	260 x	2,200	Motor oil only, indicative of asphalt
SW-3	SW-3-030720	3/7/2020	1.5	330	<250	Diesel only
SW-5	SW-5-030720	3/7/2020	1.5	1,100	<250	Diesel only
SW-6	SW-6-030720	3/7/2020	1.5	<50	<250	
Upgradient Ditch Sediment Sample						
SS-1	SS-1	3/12/2020	1	<50	1,500	Motor oil only, indicative of asphalt
MTCA Method A Soil Cleanup Level <sup>2</sup>				2,000	2,000	

### Notes

All results in milligrams per kilogram (mg/kg)

Results shown in **bold** are above the MTCA Method A Soil Cleanup Level

<sup>1</sup>Depth of sample collected in feet below ground surface (bgs)

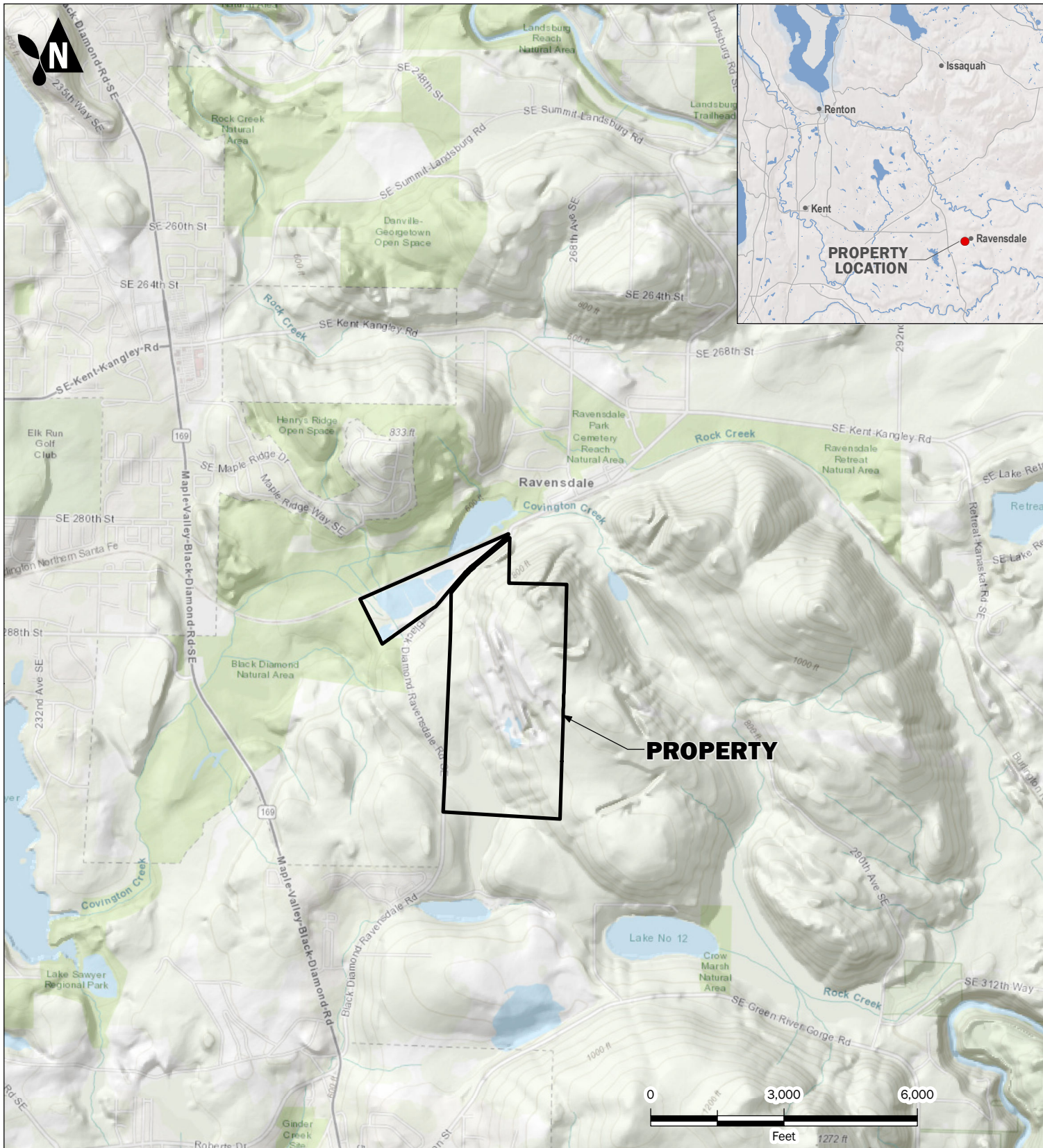
<sup>2</sup>Model Toxics Control Act (MTCA) Method A Soil Cleanup Levels for Unrestricted Land Uses.

n/a - not applicable


x - sample chromatogram does not match the standard

# FIGURES

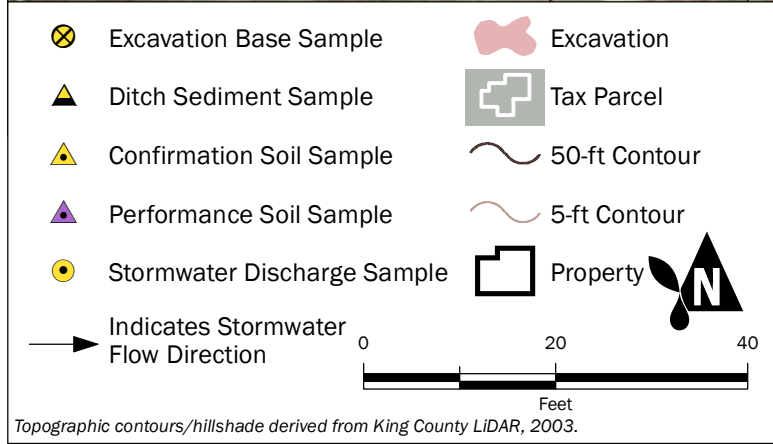
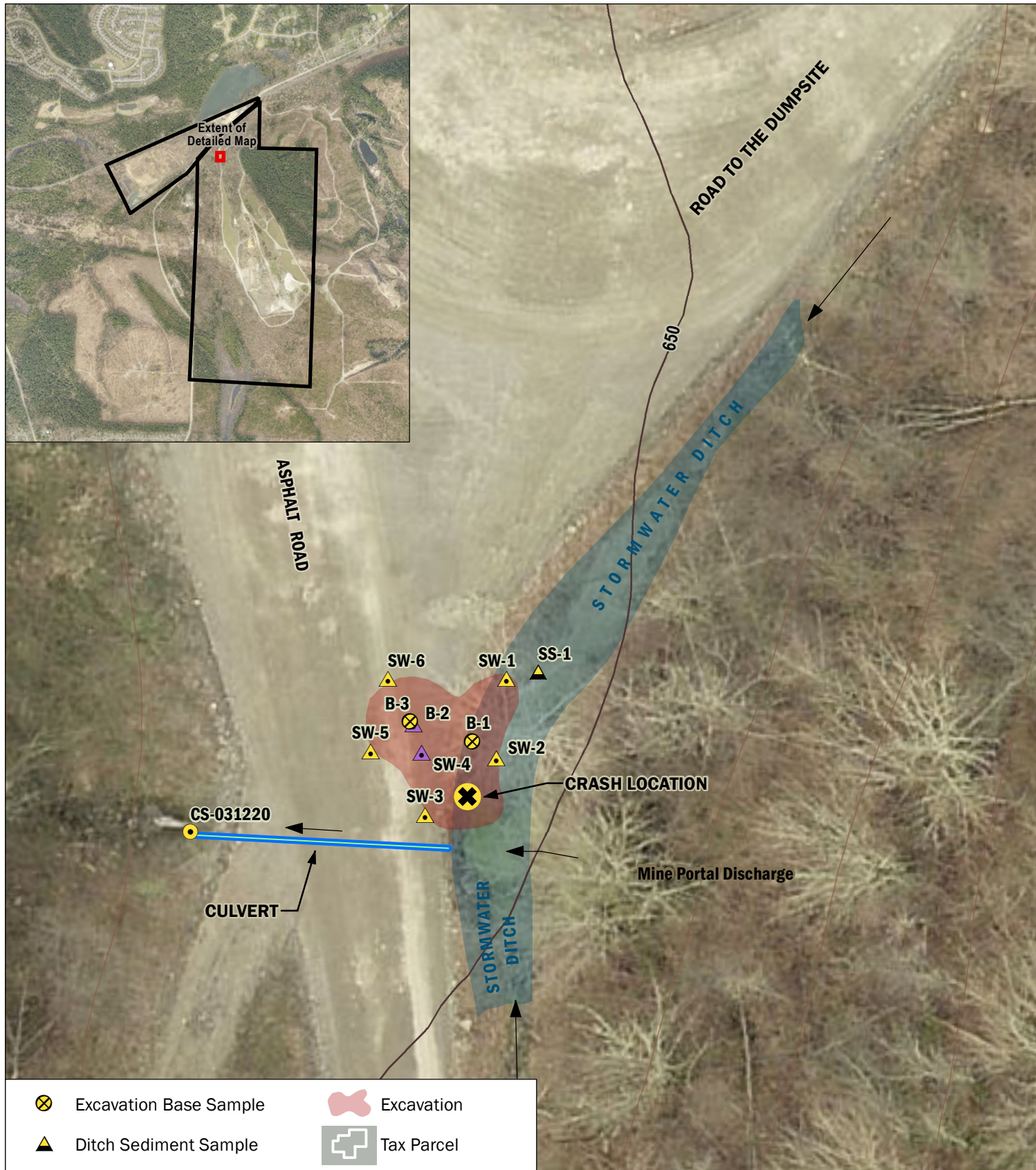




**Property Location Map**  
Fuel Spill Response Report  
Reserve Silica  
Ravensdale, Washington

	MAR-2020	BY: CEB / RAP	FIGURE NO. <b>1</b>
	PROJECT NO. 160315	REVISED BY: EAC	





# Spill Response Map

Fuel Spill Response Report  
 Reserve Silica  
 Ravensdale, Washington



MAR-2020

PROJECT NO.  
160315

BY:  
CEB / EAC

REVISED BY:  
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FIGURE NO.

2

## **ATTACHMENT A**

### **Photo Log**





Photograph 1. View of crash site on 3/6/2020 (looking south).



Photograph 2. View of stormwater bypass (left side) and absorbent socks containing diesel spill on 3/6/2020 (looking south).





Photograph 3. Location of the spill site immediately following removal of the truck from the ditch on 3/6/2020 (looking south).



Photograph 4. Beginning of soil excavation on 3/6/2020 (looking south).





Photograph 5. Midexcavation, evening of 3/6/20. Sandbags set against soil berm below culvert to maintain separation from stormwater drainage (looking southeast).





Photograph 6. Midexcavation on 3/7/2020 (looking west).



Photograph 7. Midexcavation on 3/7/2020 (looking north).





Photograph 8. Excavation extent at end of day on 3/7/2020 (looking south).





Photograph 9. Final extent of excavation on 3/12/2020 (looking southeast).

## **ATTACHMENT B**

### **Laboratory Analytical Reports**

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

March 10, 2020

Carla Brock, Project Manager  
Aspect Consulting, LLC  
710 2<sup>nd</sup> Ave S, Suite 550  
Seattle, WA 98104

Dear Ms Brock:

Included are the results from the testing of material submitted on March 9, 2020 from the Reserve Silica 160315, F&BI 003145 project. There are 4 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days, or as directed by the Chain of Custody document. 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 have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.



Michael Erdahl  
Project Manager

Enclosures  
c: Data Aspect  
ASP0310R.DOC

FRIEDMAN & BRUYA, INC.

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ENVIRONMENTAL CHEMISTS

CASE NARRATIVE

This case narrative encompasses samples received on March 9, 2020 by Friedman & Bruya, Inc. from the Aspect Consulting, LLC Reserve Silica 160315, F&BI 003145 project. Samples were logged in under the laboratory ID's listed below.

<u>Laboratory ID</u>	<u>Aspect Consulting, LLC</u>
003145 -01	B-0-030620
003145 -02	B-1-030620
003145 -03	SW-1-030620
003145 -04	SW-2-030620
003145 -05	SW-3-030620
003145 -06	SW-4-030720
003145 -07	SW-5-030720
003145 -08	B-2-030720
003145 -09	SW-6-030720

All quality control requirements were acceptable.



FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 03/10/20

Date Received: 03/09/20

Project: Reserve Silica 160315, F&BI 003145

Date Extracted: 03/09/20

Date Analyzed: 03/09/20

**RESULTS FROM THE ANALYSIS OF SOIL SAMPLES  
FOR TOTAL PETROLEUM HYDROCARBONS AS  
DIESEL AND MOTOR OIL  
USING METHOD NWTPH-Dx**

Results Reported on a Dry Weight Basis

Results Reported as mg/kg (ppm)

<u>Sample ID</u> Laboratory ID	<u>Diesel Range</u> (C <sub>10</sub> -C <sub>25</sub> )	<u>Motor Oil Range</u> (C <sub>25</sub> -C <sub>36</sub> )	<u>Surrogate</u> <u>(% Recovery)</u> (Limit 48-168)
B-0-030620 003145-01	6,200	4,600	96
B-1-030620 003145-02	<50	770	107
SW-1-030620 003145-03	330 x	3,100	102
SW-2-030620 003145-04	260 x	2,200	106
SW-3-030620 003145-05	330	<250	105
SW-4-030720 003145-06	7,600	<250	88
SW-5-030720 003145-07	1,100	<250	107
B-2-030720 003145-08	3,600	390 x	101
SW-6-030720 003145-09	<50	<250	104
Method Blank	<50	<250	98

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 03/10/20

Date Received: 03/09/20

Project: Reserve Silica 160315, F&BI 003145

**QUALITY ASSURANCE RESULTS FROM THE ANALYSIS OF SOIL SAMPLES  
FOR TOTAL PETROLEUM HYDROCARBONS AS  
DIESEL EXTENDED USING METHOD NWTPH-D<sub>x</sub>**

Laboratory Code: 003140-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result (Wet Wt)	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Diesel Extended	mg/kg (ppm)	5,000	590	92	102	73-135	10

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Diesel Extended	mg/kg (ppm)	5,000	104	74-139

# 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 analyte 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 due to sample matrix effects.

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.

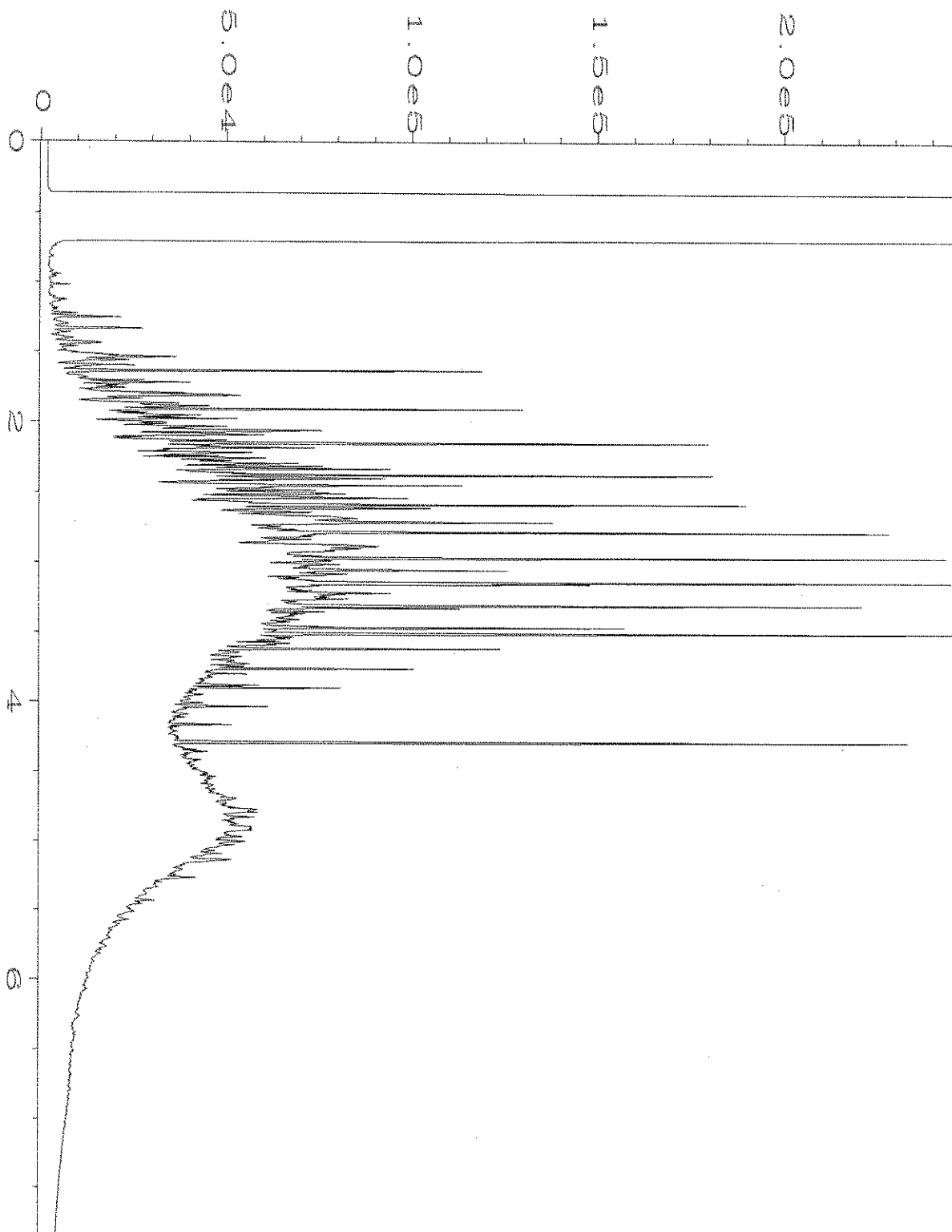
nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

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.

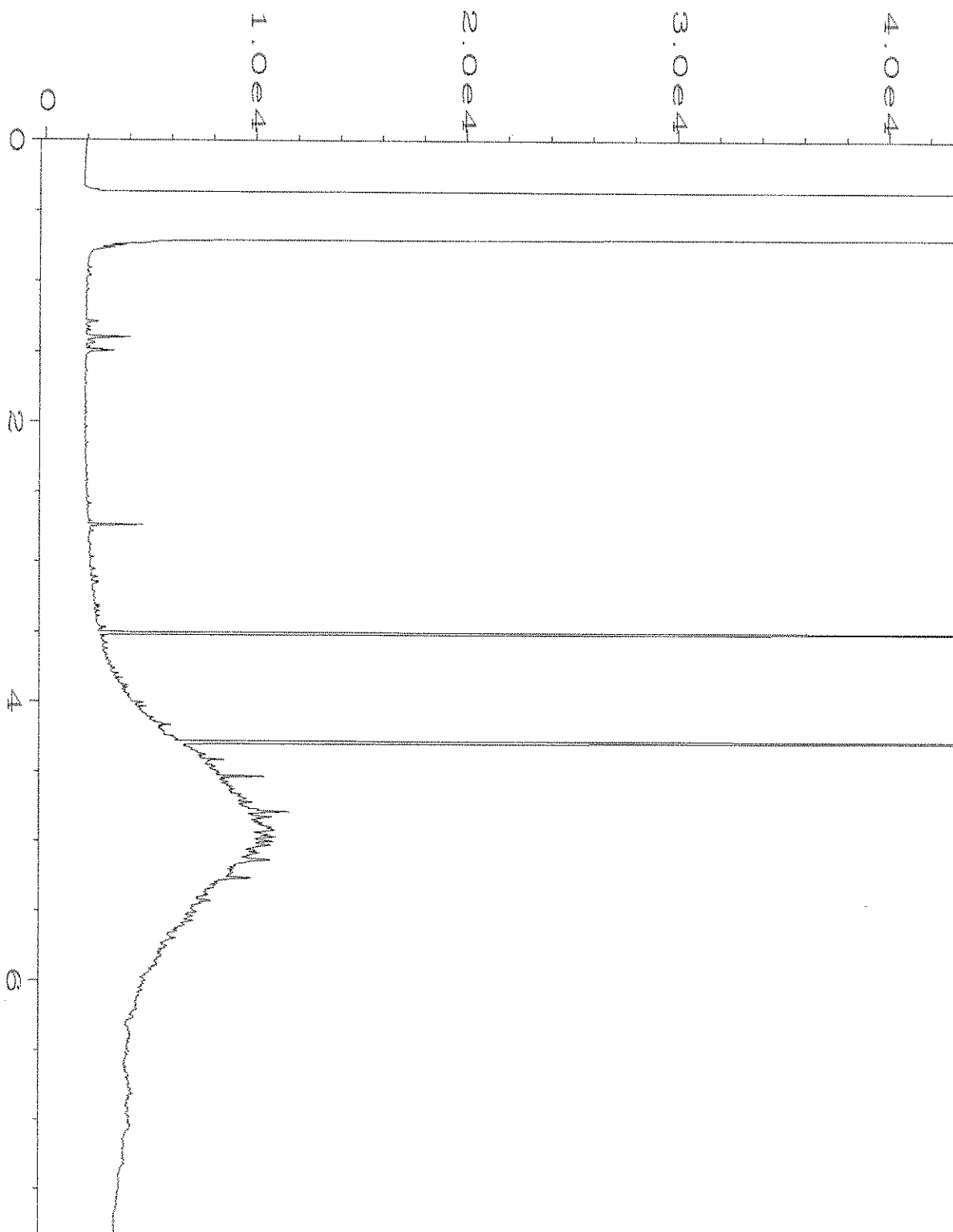
ve - The analyte response exceeded the valid instrument calibration range. The value reported is an estimate.

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

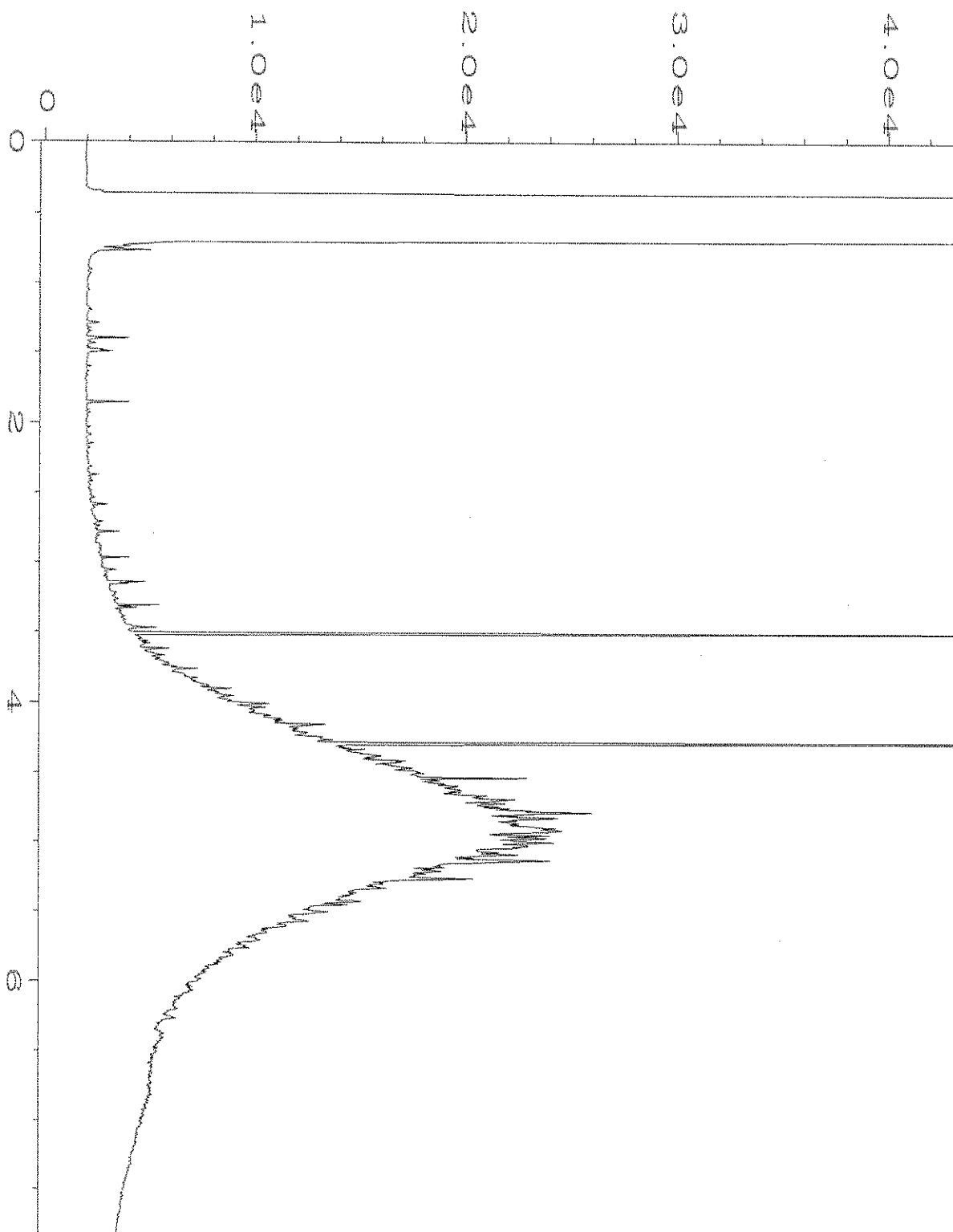
x - The sample chromatographic pattern does not resemble the fuel standard used for quantitation.



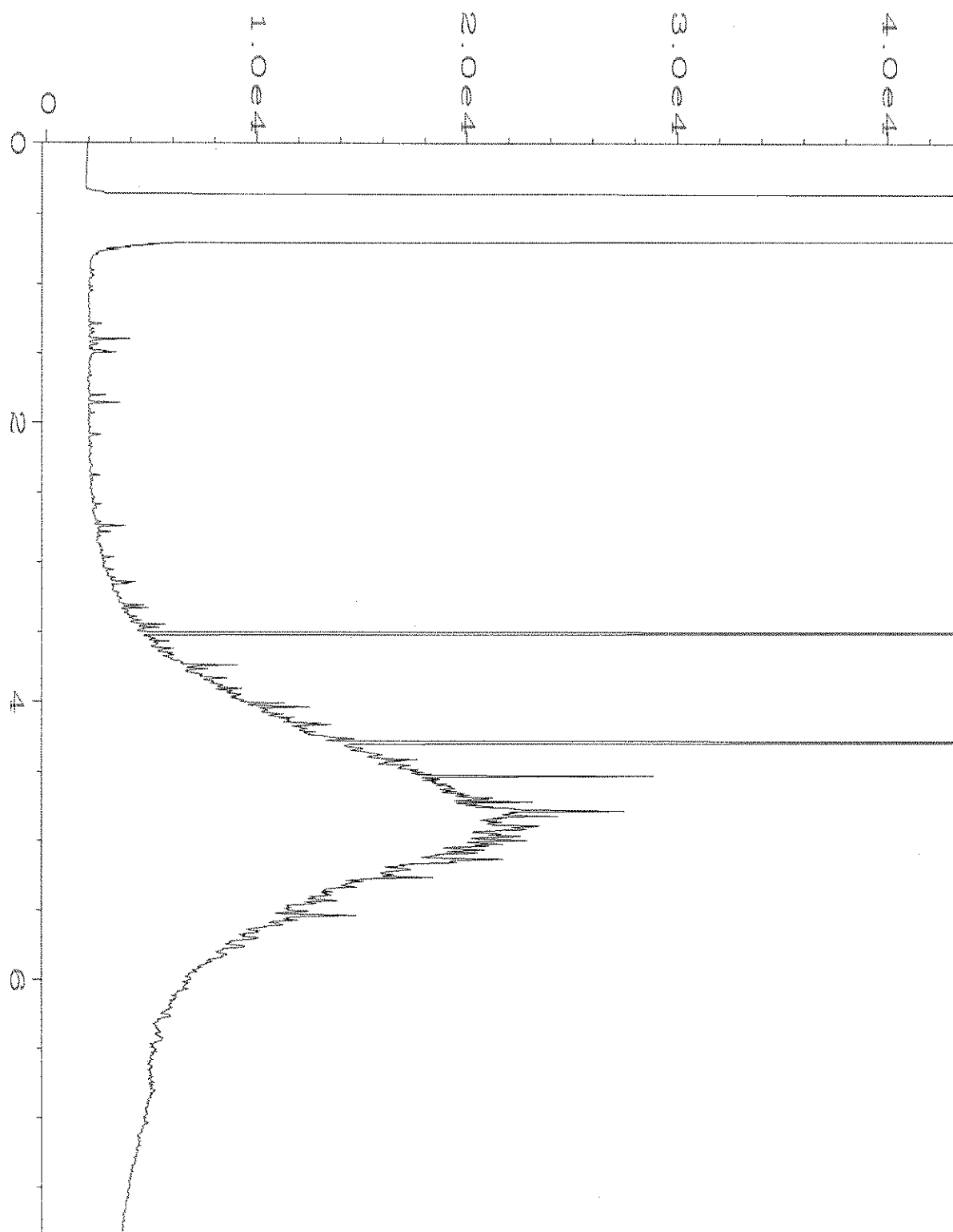
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Report Created on:	09 Mar 20 01:47 PM		

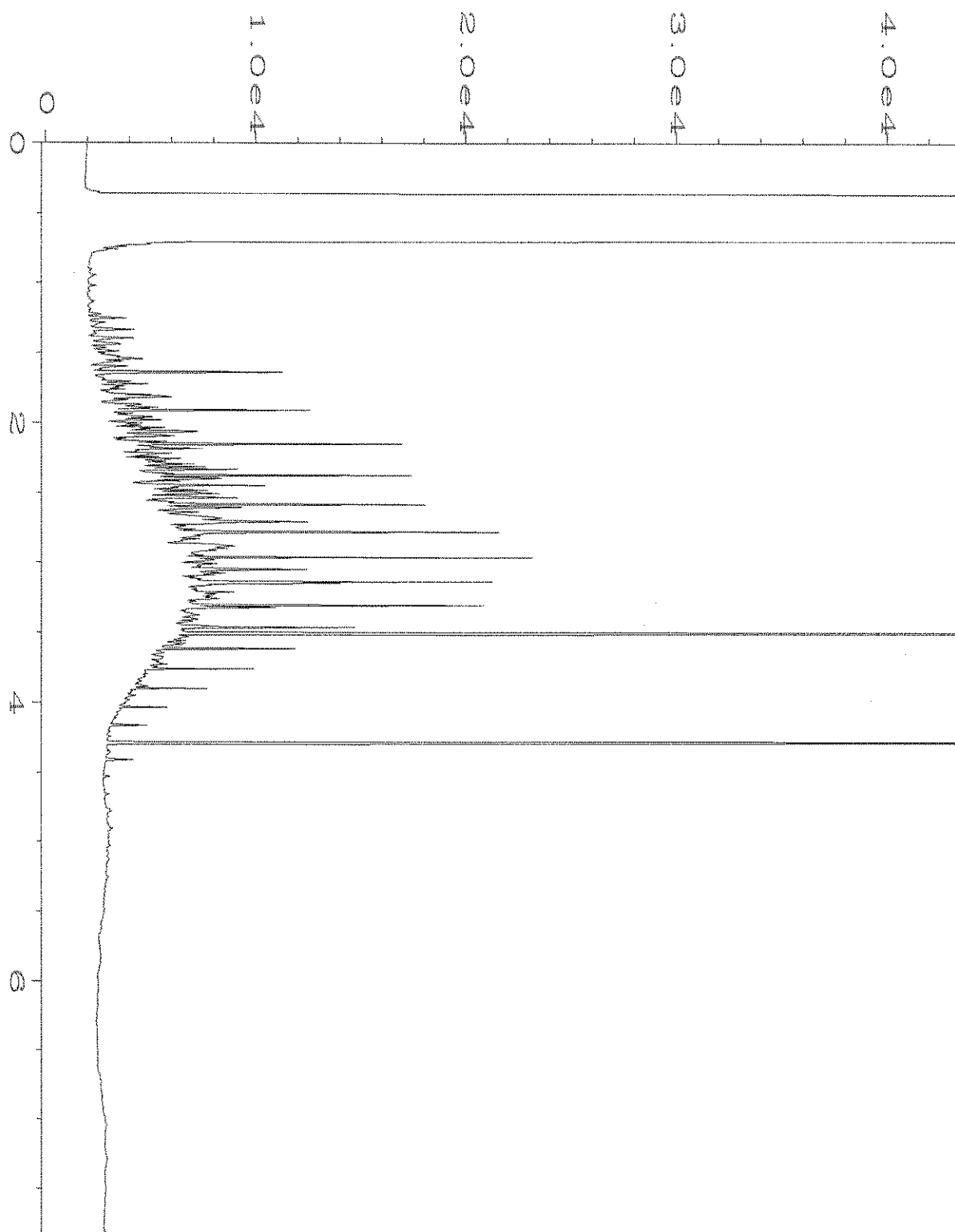


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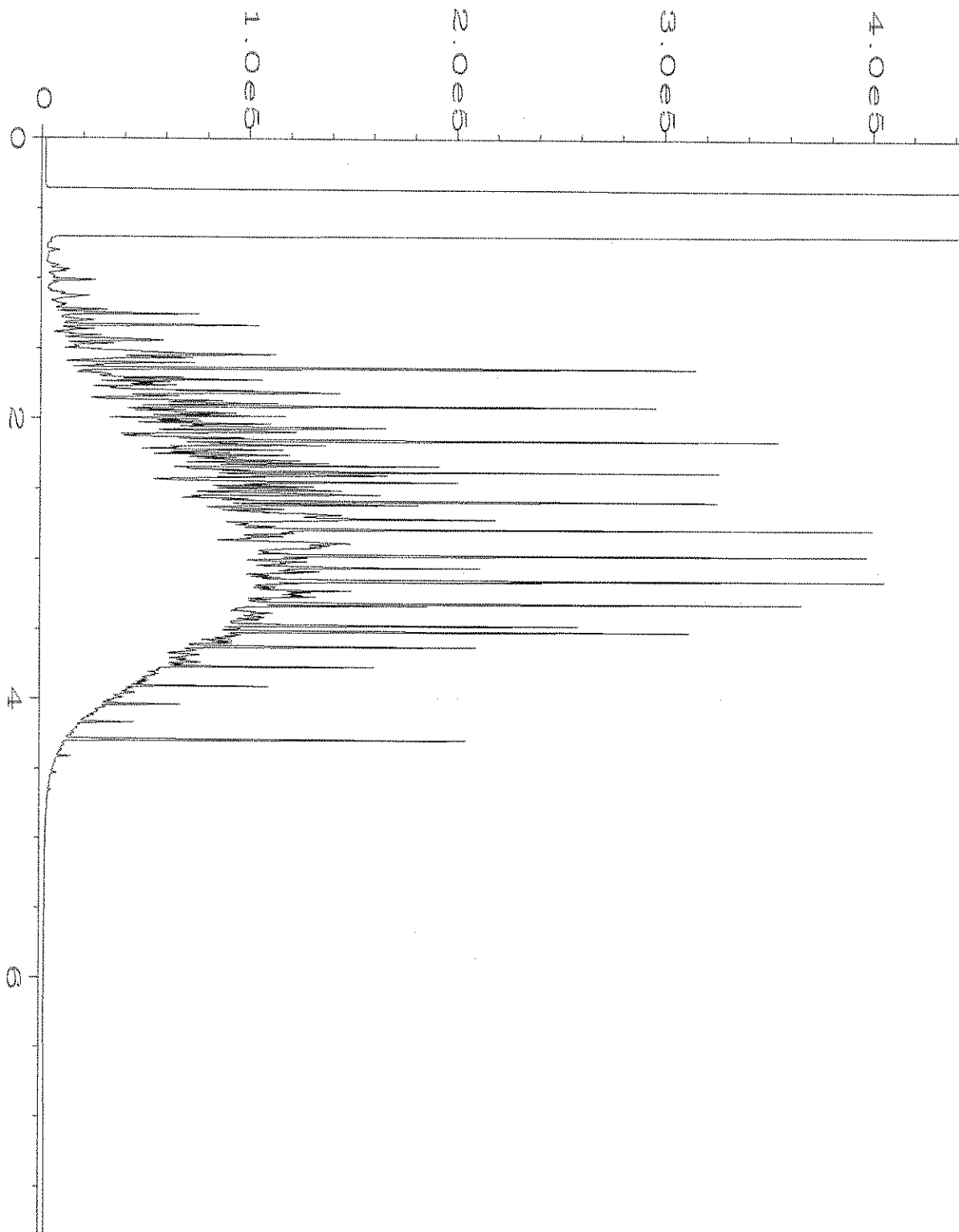


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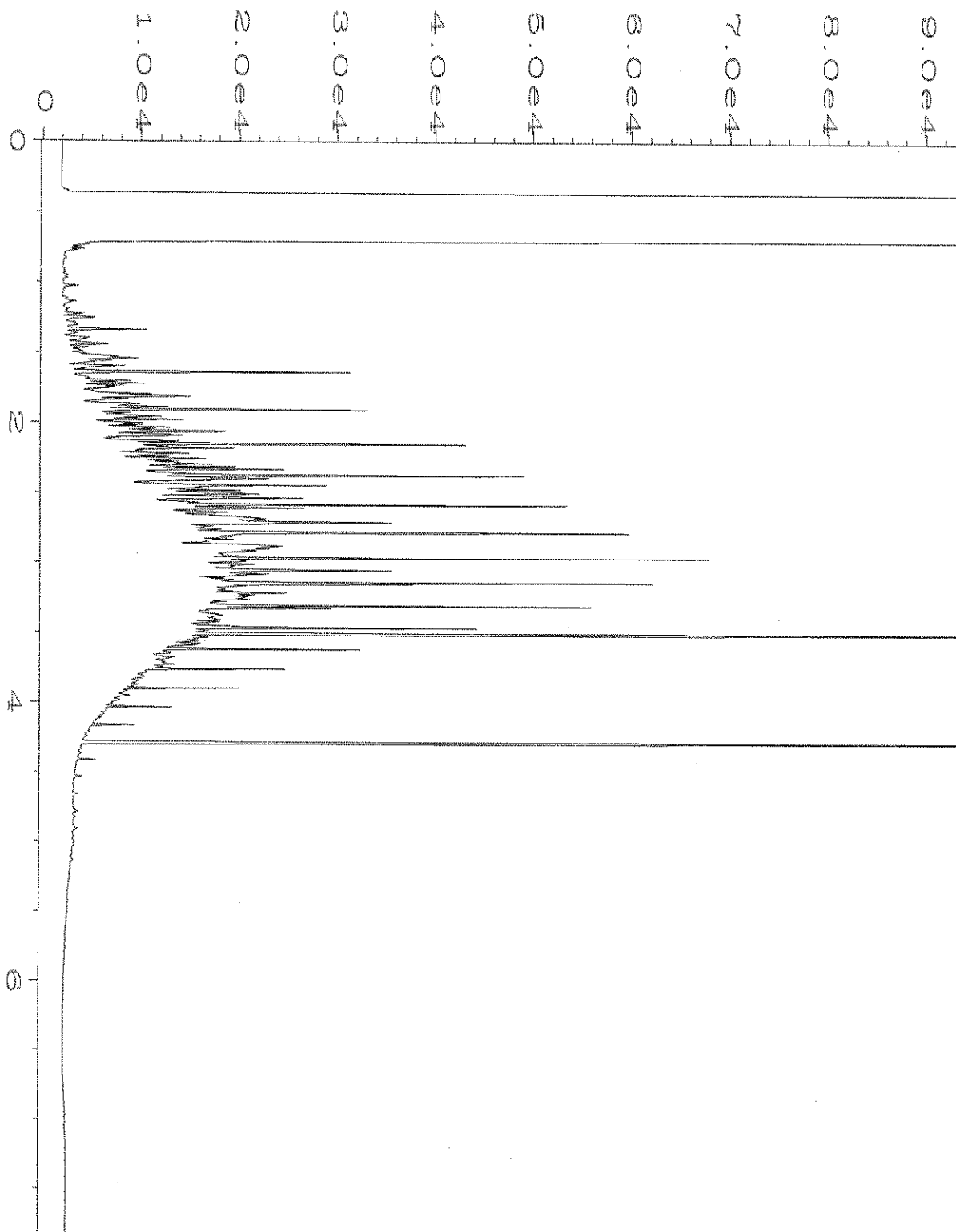




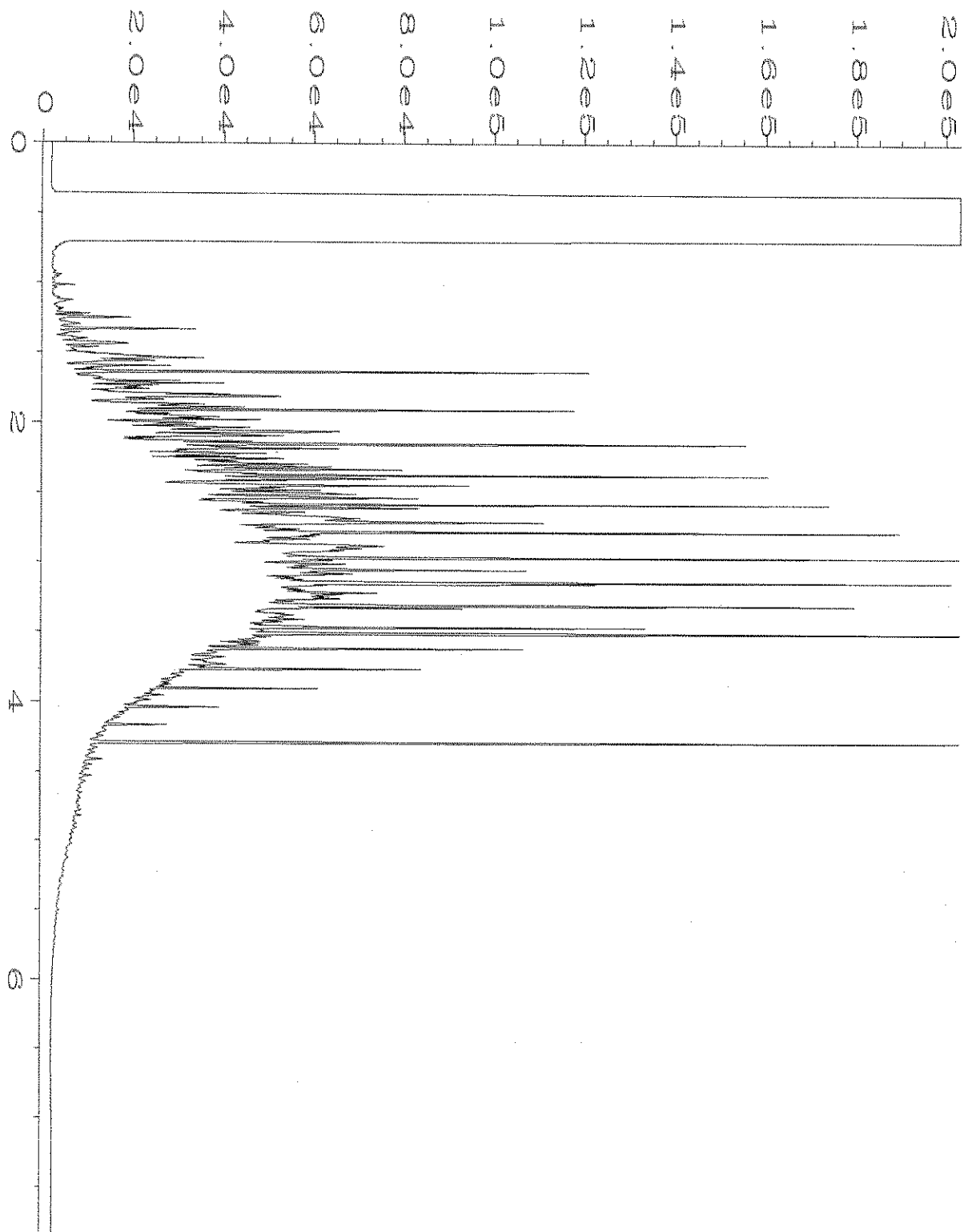
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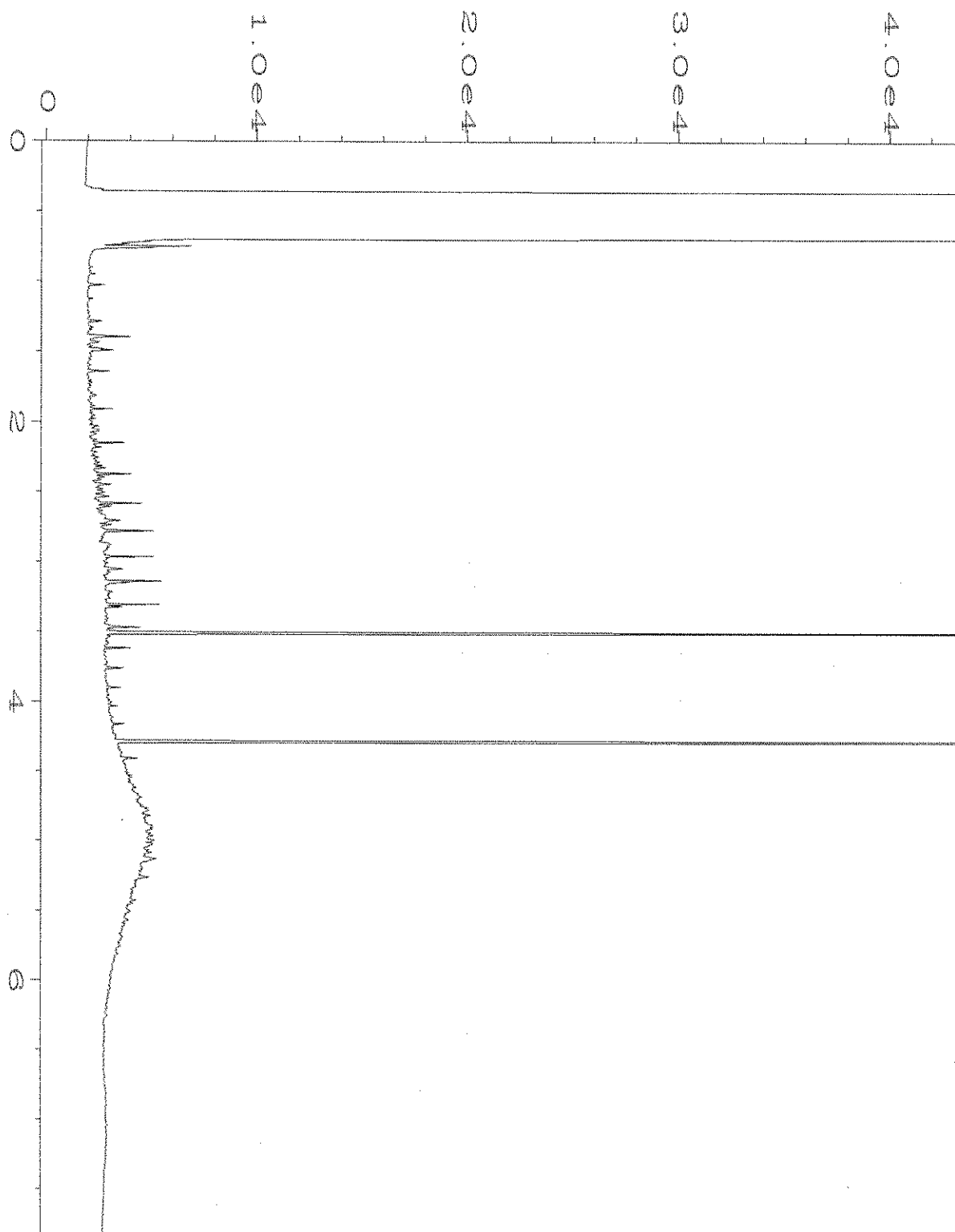
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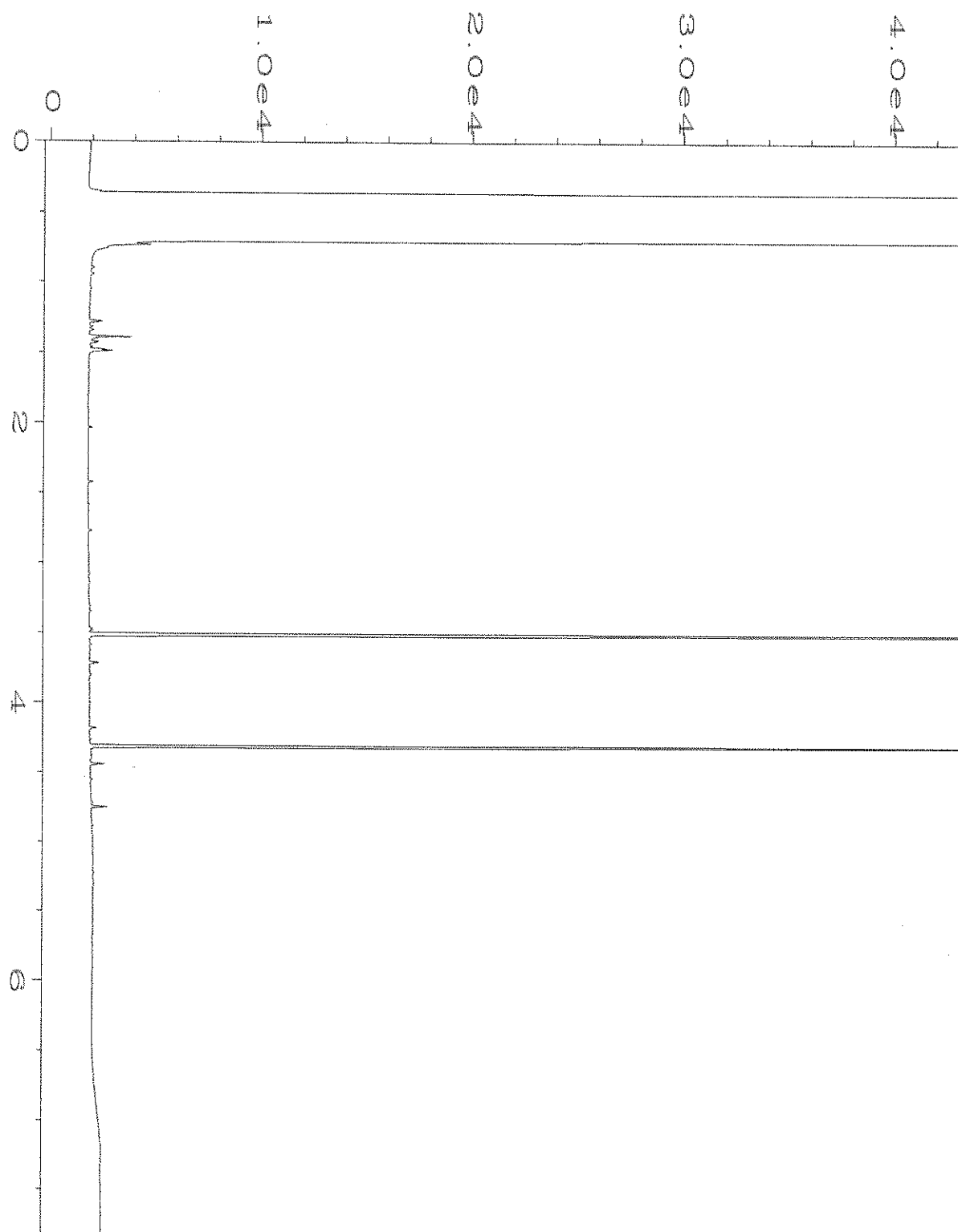
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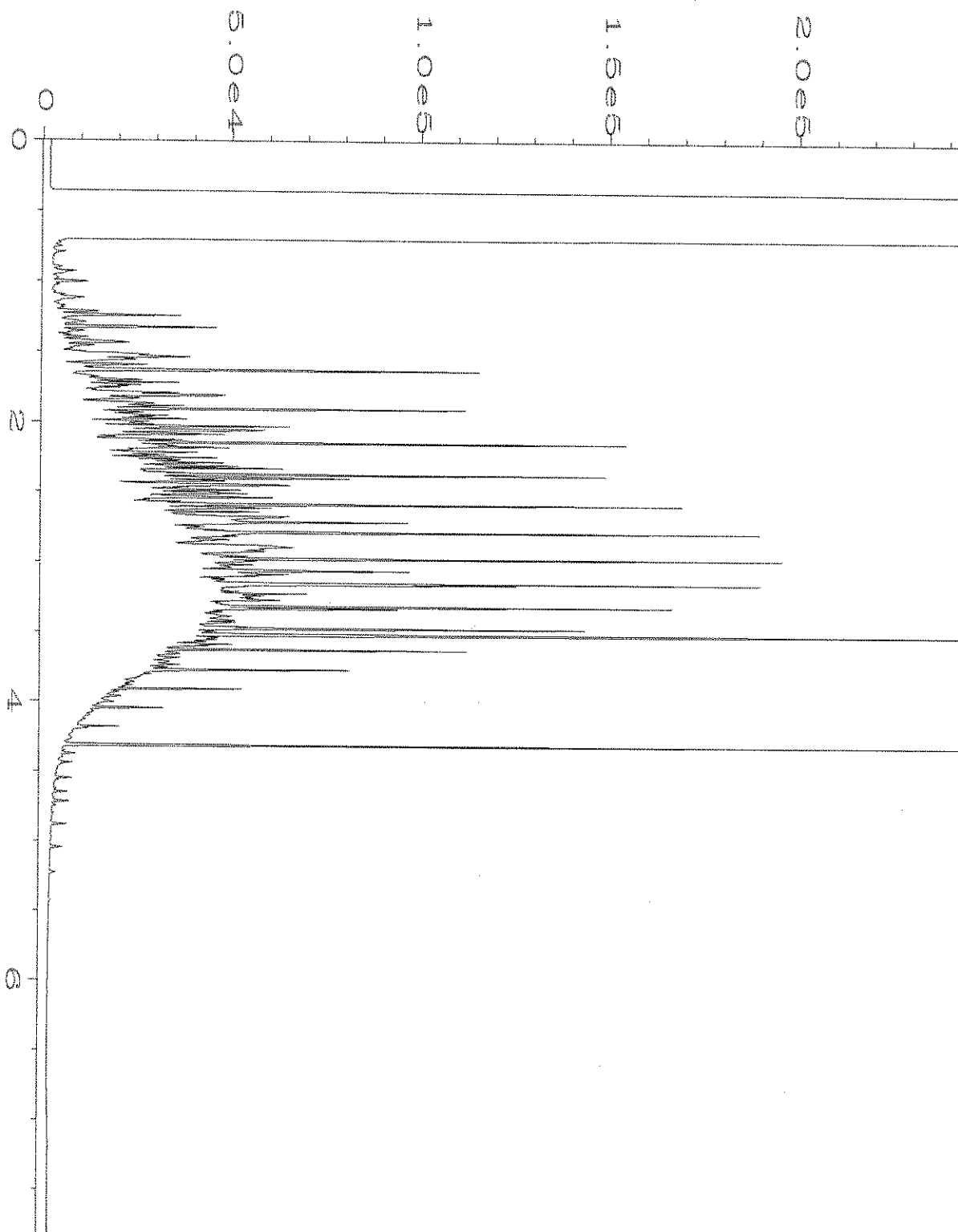
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Report Created on:	09 Mar 20 01:48 PM		



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Report Created on:	09 Mar 20 01:48 PM		



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Sample Name	: 00-588 mb	Sequence Line	: 4
Run Time Bar Code:		Instrument Method	: DX.MTH
Acquired on	: 09 Mar 20 09:03 AM	Analysis Method	: DEFAULT.MTH
Report Created on:	09 Mar 20 01:48 PM		



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Operator	: TL	Vial Number	: 3
Instrument	: GC#4	Injection Number	: 1
Sample Name	: 500 Dx 58-146H	Sequence Line	: 2
Run Time Bar Code:		Instrument Method:	DX.MTH
Acquired on	: 09 Mar 20 05:44 AM	Analysis Method	: DEFAULT.MTH
Report Created on:	09 Mar 20 01:49 PM		



003145

## SAMPLE CHAIN OF CUSTODY

ME

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09

120

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A04

Page #

of

Report To Carla BrockCompany Aspect ConsultingAddress 710 2nd Ave, Suite 550City, State, ZIP Seattle, WA

Phone \_\_\_\_\_

Email \_\_\_\_\_

SAMPLERS (signature) Carla Brock

PROJECT NAME

Reserve Silica

PO #

160315

REMARKS

INVOICE TO

AP

TURNAROUND TIME

☒ Standard Turnaround  
☒ RUSH ASAP

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	ANALYSES REQUESTED							Notes
						TPH-HCID	TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by 8260C	SVOCs by 8270D	PAHs 8270D SIM	
B-0-030620	01	3/6/20	1600	Soil	1	X							STD
B-1-030620	02		1705		1								RUSH
SW-1-030620	03		1715		1								
SW-2-030620	04		1835		1								
SW-3-030720	05	3/7/20	1115		1								
SW-4-030720	06		1118		1								
SW-5-030720	07		1557		1								
B-2-030720	08		1600		1								
SW-6-030720	09		1620		1								

SIGNATURE

PRINT NAME

COMPANY

DATE

TIME

Friedman &amp; Bryna, Inc.

3012 16th Avenue West

Seattle, WA 98119-2029

Ph. (206) 285-8282

Relinquished by: Carla BrockReceived by: M. BrockCARLA BROCKASPECT3/9/201020

Relinquished by:

M. BrockFeb. I400

Received by:

Samples received at

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

March 16, 2020

Carla Brock, Project Manager  
Aspect Consulting, LLC  
710 2<sup>nd</sup> Ave S, Suite 550  
Seattle, WA 98104

Dear Ms Brock:

Included are the results from the testing of material submitted on March 12, 2020 from the Reserve Silica 160315, F&BI 003202 project. There are 6 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days, or as directed by the Chain of Custody document. 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 have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.



Michael Erdahl  
Project Manager

Enclosures  
c: Data Aspect  
ASP0316R.DOC

FRIEDMAN & BRUYA, INC.

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ENVIRONMENTAL CHEMISTS

CASE NARRATIVE

This case narrative encompasses samples received on March 12, 2020 by Friedman & Bruya, Inc. from the Aspect Consulting, LLC Reserve Silica 160315, F&BI 003202 project. Samples were logged in under the laboratory ID's listed below.

<u>Laboratory ID</u>	<u>Aspect Consulting, LLC</u>
003202 -01	CS-031220
003202 -02	SS-1
003202 -03	B-3

All quality control requirements were acceptable.

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 03/16/20

Date Received: 03/12/20

Project: Reserve Silica 160315, F&BI 003202

Date Extracted: 03/12/20

Date Analyzed: 03/12/20

**RESULTS FROM THE ANALYSIS OF SOIL SAMPLES  
FOR TOTAL PETROLEUM HYDROCARBONS AS  
DIESEL AND MOTOR OIL  
USING METHOD NWTPH-D<sub>x</sub>**

Results Reported on a Dry Weight Basis

Results Reported as mg/kg (ppm)

<u>Sample ID</u> Laboratory ID	<u>Diesel Range</u> (C <sub>10</sub> -C <sub>25</sub> )	<u>Motor Oil Range</u> (C <sub>25</sub> -C <sub>36</sub> )	<u>Surrogate</u> <u>(% Recovery)</u> (Limit 53-144)
SS-1 003202-02	<50	1,500	89
B-3 003202-03	<50	<250	84
Method Blank 00-607 MB	<50	<250	81

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 03/16/20

Date Received: 03/12/20

Project: Reserve Silica 160315, F&BI 003202

Date Extracted: 03/12/20

Date Analyzed: 03/12/20

**RESULTS FROM THE ANALYSIS OF WATER SAMPLES  
FOR TOTAL PETROLEUM HYDROCARBONS AS  
DIESEL AND MOTOR OIL  
USING METHOD NWTPH-D<sub>x</sub>**

Results Reported as ug/L (ppb)

<u>Sample ID</u>	<u>Diesel Range</u>	<u>Motor Oil Range</u>	<u>Surrogate</u>
Laboratory ID	(C <sub>10</sub> -C <sub>25</sub> )	(C <sub>25</sub> -C <sub>36</sub> )	(% Recovery)
			(Limit 41-152)
CS-031220	<50	<250	111
003202-01			
Method Blank	<50	<250	144
00-632 MB			

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 03/16/20

Date Received: 03/12/20

Project: Reserve Silica 160315, F&BI 003202

**QUALITY ASSURANCE RESULTS FROM THE ANALYSIS OF SOIL SAMPLES  
FOR TOTAL PETROLEUM HYDROCARBONS AS  
DIESEL EXTENDED USING METHOD NWTPH-D<sub>x</sub>**

Laboratory Code: 003189-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result (Wet Wt)	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Diesel Extended	mg/kg (ppm)	5,000	<50	102	100	64-133	2

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Diesel Extended	mg/kg (ppm)	5,000	96	58-147

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 03/16/20

Date Received: 03/12/20

Project: Reserve Silica 160315, F&BI 003202

**QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER  
SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS  
DIESEL EXTENDED USING METHOD NWTPH-D<sub>x</sub>**

Laboratory Code: 003197-03 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Diesel Extended	ug/L (ppb)	2,500	26,000	108 b	1 b	50-150	196 b

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	108	63-142	16

# 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 analyte 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 due to sample matrix effects.

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.

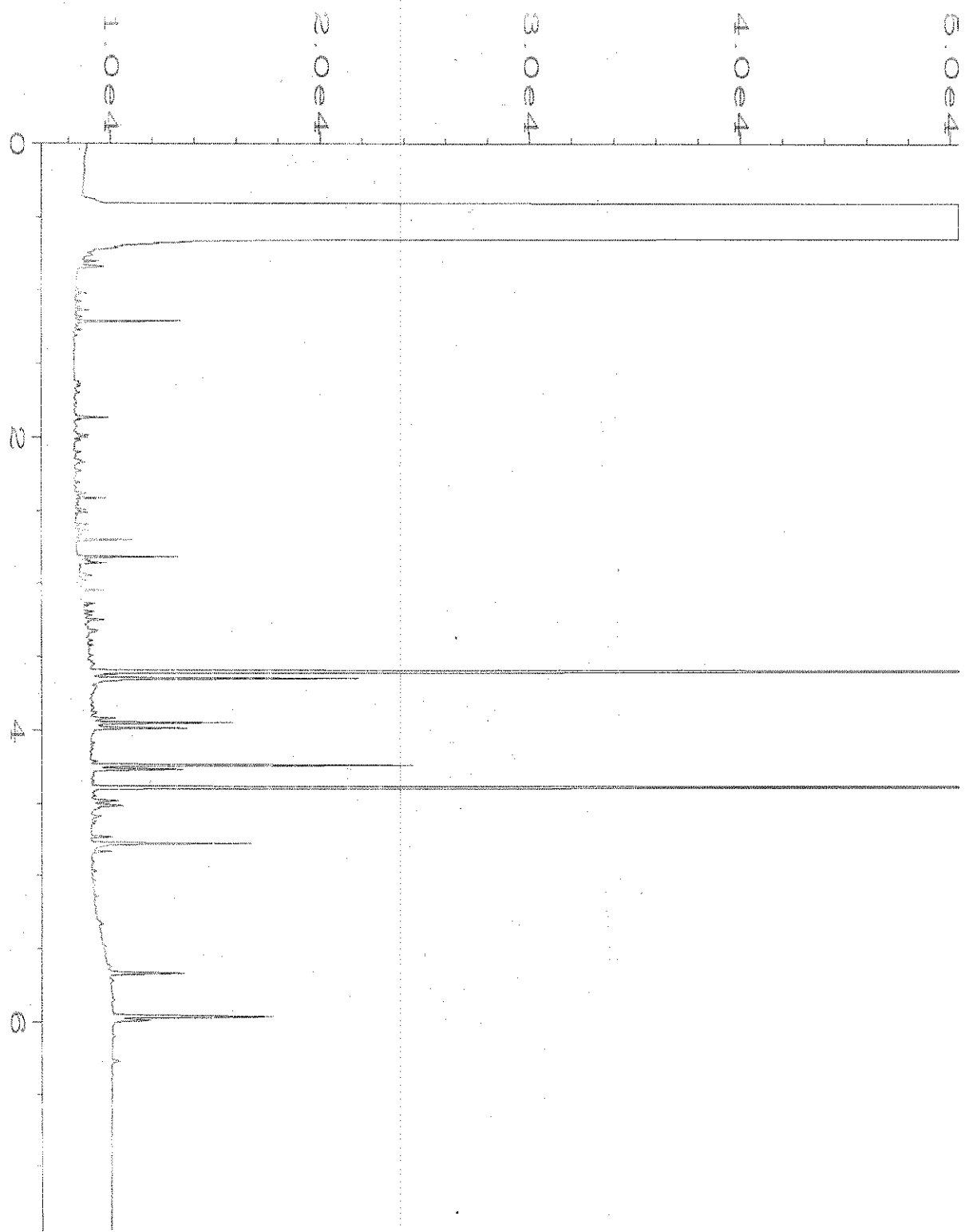
pc - The sample was received with incorrect preservation or in a container not approved by the method. The value reported should be considered an estimate.

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

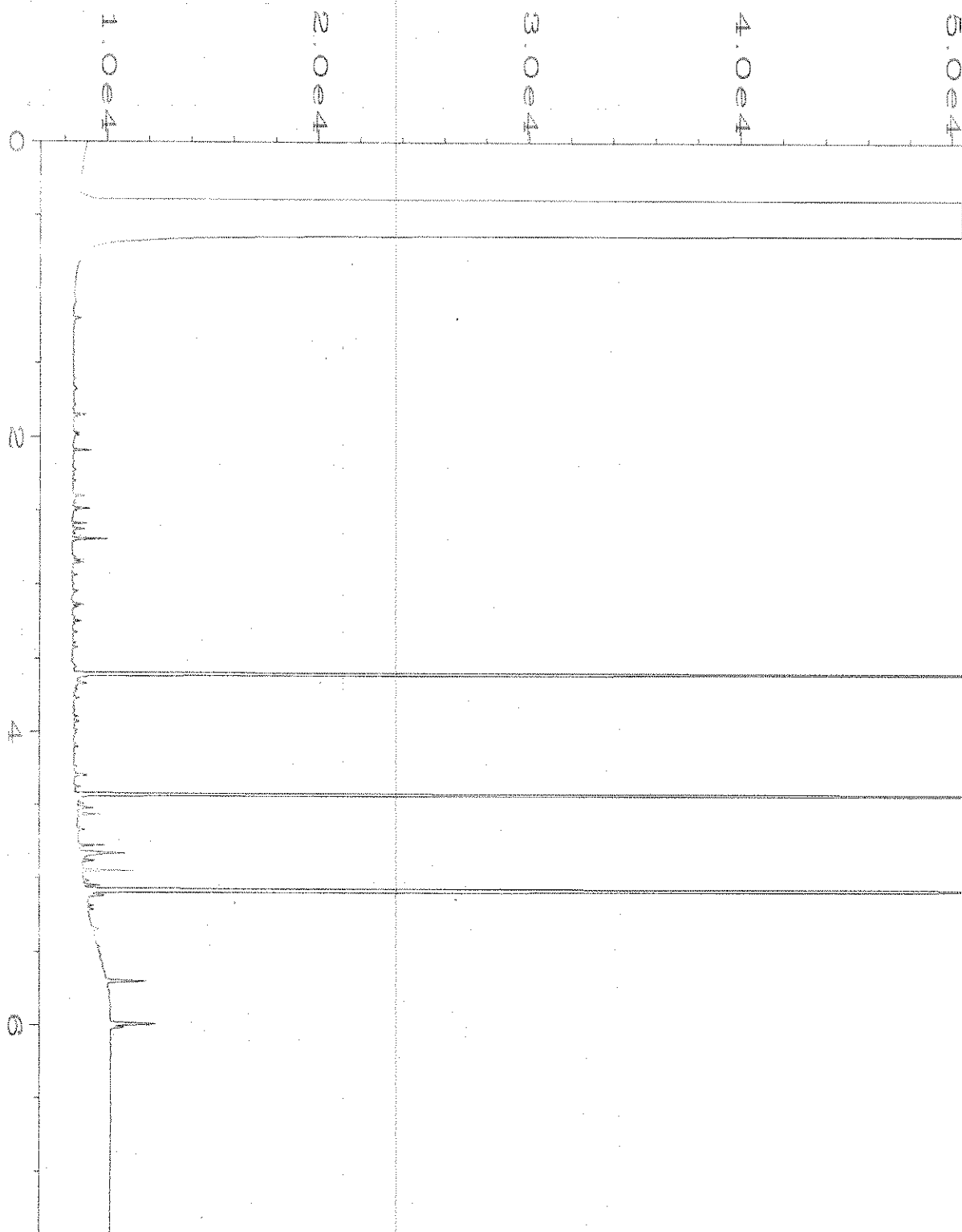
vo - The value reported fell outside the control limits established for this analyte.

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

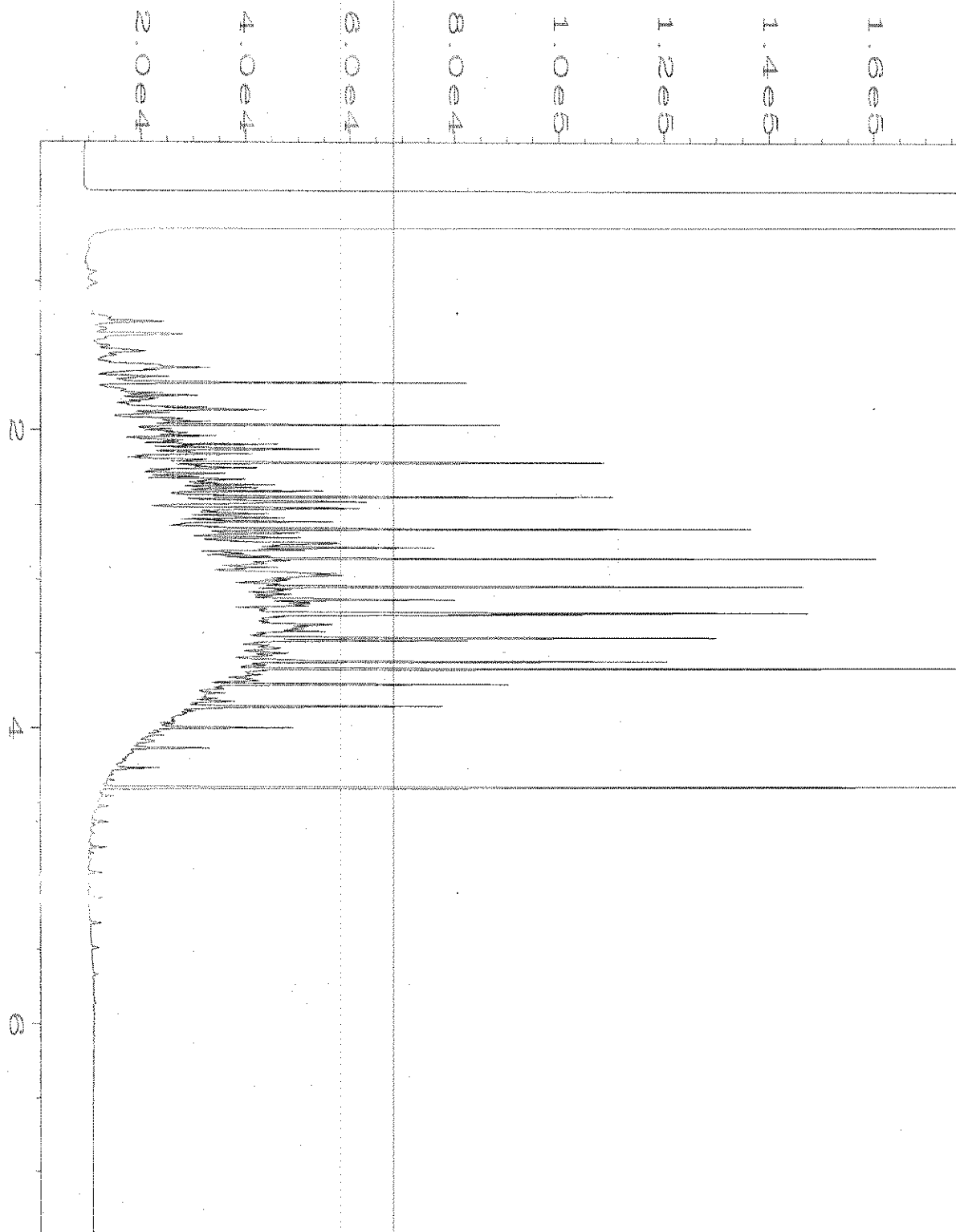




Data File Name	: C:\HPCHEM\1\DATA\03-12-20\010F0501.D	Page Number	: 1
Operator	: TL	Vial Number	: 10
Instrument	: GC1	Injection Number	: 1
Sample Name	: 003202-01	Sequence Line	: 5
Run Time Bar Code:		Instrument Method:	DX.MTH
Acquired on	: 12 Mar 20 02:38 PM	Analysis Method	: DEFAULT.MTH
Report Created on:	12 Mar 20 03:04 PM		



Data File Name	: C:\HPCHEM\1\DATA\03-12-20\009F0501.D	Page Number	: 1
Operator	: TL	Vial Number	: 9
Instrument	: GC1	Injection Number	: 1
Sample Name	: 00-632 mb	Sequence Line	: 5
Run Time Bar Code:		Instrument Method	: DX.MTH
Acquired on	: 12 Mar 20 02:29 PM	Analysis Method	: DEFAULT.MTH
Report Created on:	: 12 Mar 20 03:04 PM		



Data File Name	: C:\HPCHEM\1\DATA\03-12-20\003F0201.D	Page Number	: 1
Operator	: TL	Vial Number	: 3
Instrument	: GC1	Injection Number	: 1
Sample Name	: 500 Dx 58-146H	Sequence Line	: 2
Run Time Bar Code:		Instrument Method	: DX.MTH
Acquired on	: 12 Mar 20 05:32 AM	Analysis Method	: DEFAULT.MTH
Report Created on:	12 Mar 20 03:04 PM		

1701

TURNAROUND TIME

☐ Standard turnaround  
~~X~~ RUSH ASAP

Rush charges authorized by: Wade

SAMPLE DISPOSAL

☐ Archive samples  
☐ Other \_\_\_\_\_

Default: Dispose after 30 days

[illegible]

## **ATTACHMENT C**

### **Report Limitations and Guidelines for Use**

# REPORT LIMITATIONS AND USE GUIDELINES

## Reliance Conditions for Third Parties

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This report was prepared for the exclusive use of the Client. No other party may rely on this report or the product of our services without the express written consent of Aspect Consulting, LLC (Aspect). This limitation is to provide our firm with reasonable protection against liability claims by third parties with whom there would otherwise be no contractual conditions or limitations and guidelines governing their use of the report. Within the limitations of scope, schedule and budget, our services have been executed in accordance with our Agreement with the Client and recognized standards of professionals in the same locality and involving similar conditions.

## Services for Specific Purposes, Persons and Projects

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Aspect has performed the services in general accordance with the scope and limitations of our Agreement. This report has been prepared for the exclusive use of the Client and their authorized third parties, approved in writing by Aspect. This report is not intended for use by others, and the information contained herein is not applicable to other properties.

This report is not, and should not, be construed as a warranty or guarantee regarding the presence or absence of hazardous substances or petroleum products that may affect the subject property. The report is not intended to make any representation concerning title or ownership to the subject property. If real property records were reviewed, they were reviewed for the sole purpose of determining the subject property's historical uses. All findings, conclusions, and recommendations stated in this report are based on the data and information provided to Aspect, current use of the subject property, and observations and conditions that existed on the date and time of the report.

Aspect structures its services to meet the specific needs of our clients. Because each environmental study is unique, each environmental report is unique, prepared solely for the specific client and subject property. This report should not be applied for any purpose or project except the purpose described in the Agreement.

## This Report Is Project-Specific

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Aspect considered a number of unique, project-specific factors when establishing the Scope of Work for this project and report. You should not rely on this report if it was:

- Not prepared for you
- Not prepared for the specific purpose identified in the Agreement
- Not prepared for the specific real property assessed
- Completed before important changes occurred concerning the subject property, project or governmental regulatory actions

If changes are made to the project or subject property after the date of this report, Aspect should be retained to assess the impact of the changes with respect to the conclusions contained in the report.

## **Geoscience Interpretations**

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The geoscience practices (geotechnical engineering, geology, and environmental science) require interpretation of spatial information that can make them less exact than other engineering and natural science disciplines. It is important to recognize this limitation in evaluating the content of the report. If you are unclear how these "Report Limitations and Use Guidelines" apply to your project or site, you should contact Aspect.

## **Discipline-Specific Reports Are Not Interchangeable**

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The equipment, techniques and personnel used to perform an environmental study differ significantly from those used to perform a geotechnical or geologic study and vice versa. For that reason, a geotechnical engineering or geologic report does not usually address any environmental findings, conclusions or recommendations; e.g., about the likelihood of encountering underground storage tanks or regulated contaminants. Similarly, environmental reports are not used to address geotechnical or geologic concerns regarding the subject property.

## **Environmental Regulations Are Not Static**

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Some hazardous substances or petroleum products may be present near the subject property in quantities or under conditions that may have led, or may lead, to contamination of the subject property, but are not included in current local, state or federal regulatory definitions of hazardous substances or petroleum products or do not otherwise present potential liability. Changes may occur in the standards for appropriate inquiry or regulatory definitions of hazardous substance and petroleum products; therefore, this report has a limited useful life.

## **Property Conditions Change Over Time**

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This report is based on conditions that existed at the time the study was performed. The findings and conclusions of this report may be affected by the passage of time (for example, Phase I ESA reports are applicable for 180 days), by events such as a change in property use or occupancy, or by natural events, such as floods, earthquakes, slope failure or groundwater fluctuations. If more than six months have passed since issuance of our report, or if any of the described events may have occurred following the issuance of the report, you should contact Aspect so that we may evaluate whether changed conditions affect the continued reliability or applicability of our conclusions and recommendations.



## **Phase I ESAs – Uncertainty Remains After Completion**

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Aspect has performed the services in general accordance with the scope and limitations of our Agreement and the current version of the “Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process”, ASTM E1527, and U.S. Environmental Protection Agency (EPA)'s Federal Standard 40 CFR Part 312 "Innocent Landowners, Standards for Conducting All Appropriate Inquiries".

No ESA can wholly eliminate uncertainty regarding the potential for recognized environmental conditions in connection with subject property. Performance of an ESA study is intended to reduce, but not eliminate, uncertainty regarding the potential for environmental conditions affecting the subject property. There is always a potential that areas with contamination that were not identified during this ESA exist at the subject property or in the study area. Further evaluation of such potential would require additional research, subsurface exploration, sampling and/or testing.

## **Historical Information Provided by Others**

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Aspect has relied upon information provided by others in our description of historical conditions and in our review of regulatory databases and files. The available data does not provide definitive information with regard to all past uses, operations or incidents affecting the subject property or adjacent properties. Aspect makes no warranties or guarantees regarding the accuracy or completeness of information provided or compiled by others.

## **Exclusion of Mold, Fungus, Radon, Lead, and HBM**

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Aspect's services do not include the investigation, detection, prevention or assessment of the presence of molds, fungi, spores, bacteria, and viruses, and/or any of their byproducts. Accordingly, this report does not include any interpretations, recommendations, findings, or conclusions regarding the detection, assessment, prevention or abatement of molds, fungi, spores, bacteria, and viruses, and/or any of their byproducts. Aspect's services also do not include the investigation or assessment of hazardous building materials (HBM) such as asbestos, polychlorinated biphenyls (PCBs) in light ballasts, lead based paint, asbestos-containing building materials, urea-formaldehyde insulation in on-site structures or debris or any other HBMs. Aspect's services do not include an evaluation of radon or lead in drinking water, unless specifically requested.