1818 New York Ave. NE, Ste 231, Washington, DC 20002

Telephone: (301) 595-3783 www.salutinc.com

January 12, 2021

Prince George's County Public Schools Environmental Safety Office 13306 Old Marlboro Pike Upper Marlboro, MD 20772

Attention: Alex Baylor

alex.baylor@pgcps.org

Subject: Indoor Air Quality Survey

Rainier Elementary School

4001 32nd Street

Mt. Rainier, MD 20712

Mr. Baylor:

On December 11, 2020, a Soil and Land Use Technology, Inc. (SaLUT) Industrial Hygienist conducted an indoor air quality (IAQ) evaluation at Rainier Elementary School, a property maintained by Prince George's County Public Schools (PGCPS) located at 4001 32nd Street, Mt. Rainier, MD 20712. The inspection was performed in accordance with PGCPS contract number IFB 022-19.

#### Methodology

The IAQ evaluation conducted by SaLUT included a visual assessment, IAQ instrumentation screening, and a collection of interior air samples for mold in representative locations throughout the building. Additionally, one building exterior environmental air sample was taken for comparison.

Air-borne fungal spore samples were collected on *Air-O-Cell* cassettes using a Buck BioAire calibrated pump. The air samples were taken between three and five feet from the ground. In tandem with collecting mold samples, real-time readings for carbon dioxide, carbon monoxide, temperature and relative humidity were collected using a Fluke 975 Air Meter in representative areas within the facility.

The fungal spore air samples were delivered to EMSL Analytical, Inc. of Beltsville, Maryland for analysis. Fungal spores and particulates in air samples were analyzed by Optical Microscopy (methods EMSL 05-TP-003 and ASTM D7391). The sample chain-of-custody and laboratory reports are attached.



#### **Observations**

The table below summarizes the main observations from the IAQ survey at Rainier Elementary School, visited on December 11, 2020.

**Table 1-Observations** 

Location	Summary of Observations 12-11-2020
Hallway in front of	2'x4' ceiling tiles and 1'x1' tile floor;
Main Entrance	No visual signs of microbial growth;
	Mild odor;
	No visible dust on floor/other furniture surfaces;
	No visible dust around ventilator;
	Central AC.
Hallway in front of	2'x4' ceiling tiles and 1'x 1' tile floor;
Conference Room	No visual signs of microbial growth, and no odor;
	No visible dust on floor/other furniture surfaces;
	No visible dust around ventilator;
	Central AC.
Hallway between	2'x4' ceiling tiles and 1'x 1' tile floor;
Classrooms 2 and 6	No visual signs of microbial growth, and no odor;
	No visible dust on floor/other furniture surfaces;
	No visible dust around ventilator;
	Central AC.
Hallway between	2'x4' ceiling tiles and 1'x 1' tile floor;
Classrooms 8 and 11	No visual signs of microbial growth, and no odor;
	No visible dust on floor/other furniture surfaces;
	No visible dust around ventilator;
	Central AC.
Hallway between	2'x4' ceiling tiles and 1'x 1' tile floor;
Classrooms 10 and 13	No visual signs of microbial growth, and no odor;
	No visible dust on floor/other furniture surfaces;
	No visible dust around ventilator;
	Central AC.
Outside Exterior EV	Windy
Sample	

# Measurements of Indoor Environmental Quality Parameters

Table 2 depicts a summary of average measurements of comfort.

#### **Temperature**

The American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) have published recommendations for year round acceptable temperatures in Standard 55-2010 *Thermal Environmental Conditions for Human Occupancy*. The winter comfort range is 20 to 24°C (68 to 75°F) and 23 to 26°C (73 to 79°F) is the summer comfort range. The temperature readings were within the ASHRAE recommended ranges in the representative spaces with the exception of some locations.



## Relative Humidity (RH)

RH is a key factor for mold growth. Mold has the potential of growing on suitable surfaces with humidity levels above 60%. ASHRAE Standard 62.1-2010 *Ventilation for Acceptable Indoor Air Quality* recommends a maximum indoor RH of 65% to preclude the likelihood of condensation on cool surfaces encouraging mold growth. The RH readings were within the ASHRAE recommended ranges in the representative areas.

## Carbon Dioxide (CO<sub>2</sub>)

Under conditions of maximum occupancy, ASHRAE Standard 62.1-2010, Appendix C, infers that the acceptable CO<sub>2</sub> upper limit is the prevailing outdoor CO<sub>2</sub> concentration plus 700 parts per million (ppm). On the day of the space evaluation, the outdoor (building exterior) CO<sub>2</sub> concentration was approximately 439 ppm therefore indoor concentrations should not exceed approximately 1,139 ppm (700 + 439). The maximum average interior CO<sub>2</sub> concentration detected was 678 ppm in the Hallway between Classrooms 2 and 6, a range within the ASHRAE recommendations, per Table 2 below.

#### Carbon Monoxide (CO)

CO is a colorless and odorless gas that is produced by the incomplete combustion of carbon containing fuels. Oil, gasoline, diesel fuels, wood, coke, and coal are major sources of CO. All registered CO concentrations were below the EPA National Ambient Air Quality Standard (NAAQS) of 9 ppm, per Table 2 below.

Table 2: Rainier Elementary School, Instrumental Screening Levels December 11, 2020 (7:30 AM-9:30 AM)

Sample Location	Temp <sup>0</sup> F	RH%	CO ppm	CO <sub>2</sub> ppm
Standards	ASHRAE 68 to 75°F*	ASHRAE <65%	NAAQS 9	ASHRAE 1,139
Hallway in front of Main Entrance	67.4	27.7	0	658
Hallway in front of Conference Room	68.5	30.2	0	634
Hallway between Classrooms 2 and 6	69.7	28.2	0	678
Hallway between Classrooms 8 and 11	67.4	25.8	0	68.0
Hallway between Classrooms 10 and 13	63.9	23.1	0	623
Outside Exterior EV Sample	37.7	50.9	0	439

PM - Particulate Matter size

°F – Degrees Fahrenheit

CO - Carbon Monoxide

ppm - parts per million

μg/m³ – micrograms per cubic meter

RH% - % Relative Humidity

CO<sub>2</sub> - Carbon Dioxide

\* - Winter Comfort Range



## **Mold-in-Air Samples**

There are no definitive regulations or standardized guidelines for addressing airborne mold in an indoor setting. If building systems (ventilation, envelope) are functioning properly, the indoor population profile should mimic what is encountered outdoors and the concentrations should be below the outdoor (building exterior) environmental sample levels.

Tables 3 summarizes airborne mold spore sampling results and locations. On December 11, 2020, total mold counts in representative samples (spore count/m³ of air) in all the areas inspected were lower than the outdoor concentrations. Laboratory analysis follows this report (see attachment).

Table 3: Rainier Elementary School - Measurements of Mold-in-Air Samples December 11, 2020 (7:30 AM-9:30 AM)

Spore Types	Hallway in front of Main Entrance	Hallway in front of Conference Room	Hallway Between Classroom 2 and 6	Hallway Between Classroom 8 and 11
Alternaria (Ulocladium)	-	-	-	-
Ascospores	100	200	40	-
Aspergillus/Penicillium	-	100	-	-
Basidiospores	1,700	2,000	1,800	660
Bipolaris++	-	-	-	-
Chaetomium	-	-	-	-
Cladosporium	40	100	40	-
Curvularia	-	-	-	-
Ерісоссит	-	-	-	-
Fusarium	-	-	-	-
Ganoderma	-	-	-	-
Myxomycetes++	-	40	-	-
Pithomyces++	-	-	-	-
Rust	-	-	-	40
Scopulariopsis/Microascus	-	-	-	-
Stachybotrys/Memnoniella	-	-	-	-
Unidentifiable Spores	-	-	-	-
Zygomycetes	-	-	-	-
Nigrospora	-	-	-	-
Hyphal Fragment	40	-	-	-
Insect Fragment	40	30*	40	10*
Pollen	-	-	-	-
Total Fungi	1,840	2,440	1,880	700

<sup>\*</sup> Spore Counts per cubic meter of air (Counts/m<sup>3</sup>).

<sup>++</sup>Includes other spores with similar morphology.



# Table 3: Rainier Elementary School Measurements of Mold-in-Air Samples continued December 11, 2020 (7:30 AM-9:30 AM)

Spore Types	Hallway Between Classroom 10 and 13	Outside Exterior EV Sample	Field Blank
Alternaria (Ulocladium)	-	40	-
Ascospores	40	200	-
Aspergillus/Penicillium	40	200	-
Basidiospores	620	6,890	-
Bipolaris++	-	-	-
Chaetomium	-	-	-
Cladosporium	100	1,400	-
Curvularia	-	-	-
Ерісоссит	-	200	-
Fusarium	-	-	-
Ganoderma	-	-	-
Myxomycetes++	10*	3,300	-
Pithomyces++	-	-	-
Rust	-	-	-
Scopulariopsis/Microascus	-	-	-
Stachybotrys/Memnoniella	-	-	-
Unidentifiable Spores	-	-	-
Zygomycetes	-	-	-
Nigrospora	-	-	-
Hyphal Fragment	-	200	-
Insect Fragment	40	-	-
Pollen	-	-	-
<b>Total Fungi</b>	810	12,230	No Trace

<sup>\*</sup>Spore Counts per cubic meter of air (Counts/m<sup>3</sup>).

<sup>++</sup>Includes other spores with similar morphology.



#### **Findings and Conclusions**

The comfort parameters (i.e., temperature, RH, CO<sub>2</sub>, and CO levels) in the representative areas conform to ASHRAE and/or NAAQS guidelines with the exception of the temperature. On December 11, 2020, total mold counts in representative area samples (spore count/m³ of air) in all the areas inspected were lower than the outdoor concentrations, indicating no amplified mold growth.

Thank you for the opportunity to provide industrial hygiene services for PGCPS. If you have any questions, please contact me at 301.595.3783.

Sincerely,

Chaminda Jayatilake, PE, CIH, CSP, CHMM

Certified Industrial Hygienist

Soil and Land Use Technology Inc. (SaLUT)

#### Attachment

Attachment - Mold Spore Sample Analytical Results and Chain-of-Custody Forms

# **Attachment**

# Mold Spore Sample Analytical Results and Chain-of-Custody Forms



Attention: Indika Jayatilake

**SaLUT** 

Suite 231

Project: 19-035-Mt. Rainier ES

1818 New York Avenue, NE

Washington, DC 20002

EMSL Order: 192012242 Customer ID: SALU50

Customer PO: Project ID:

**Phone**: (301) 595-3783

Fax: (301) 595-3787

Collected Date: 12/11/2020

Collected Date. 12/11/2020

Received Date: 12/11/2020 04:02 PM

**Analyzed Date:** 12/15/2020

Test Report:Air-O-Cell(™) Analysis of Fungal Spores & Particulates by Optical Microscopy (Methods MICRO-SOP-201, ASTM D7391)

Lab Sample Number: Client Sample ID: Volume (L):	1	192012242-0001     192012242-0002     192012242-0003       S1     S2     S3       75     75     75				S2			
Sample Location:	HW In Fi	ont of Main Ent	trance	HW In Fro	nt of Conferenc	e Room	HW Be	etween CR 8 an	d 11
Spore Types	Raw Count	Count/M³	% of Total	Raw Count	Count/M³	% of Total	Raw Count	Count/M³	% of Total
Alternaria (Ulocladium)	-	-	· -	-	-	· -	-	-	-
Ascospores	3	100	5.4	4	200	8.2	-	-	-
Aspergillus/Penicillium	-	-	-	3	100	4.1	-	-	-
Basidiospores	42	1700	92.4	49	2000	82	16	660	94.3
Bipolaris++	-	-	-	-	-	-	-	-	-
Chaetomium	-	-	-	-	-	-	-	-	-
Cladosporium	1	40	2.2	3	100	4.1	-	-	-
Curvularia	-	-	-	-	-	-	-	-	-
Epicoccum	-	-	-	-	-	-	-	-	-
Fusarium	-	-	-	-	-	-	-	-	-
Ganoderma	-	-	-	-	-	-	-	-	-
Myxomycetes++	-	-	-	1	40	1.6	-	-	-
Pithomyces++	-	-	-	-	-	-	-	-	-
Rust	-	-	-	-	-	-	1	40	5.7
Scopulariopsis/Microascus	-	-	-	-	-	-	-	-	-
Stachybotrys/Memnoniella	-	-	-	-	-	-	-	-	-
Unidentifiable Spores	-	-	-	-	-	-	-	-	-
Zygomycetes	-	-	-	-	-	-	-	-	-
Total Fungi	46	1840	100	60	2440	100	17	700	100
Hyphal Fragment	1	40	-	-	-	-	-	-	-
Insect Fragment	1	40	-	2*	30*	-	1*	10*	-
Pollen	-	-	-	-	-	-	-	-	-
Analyt. Sensitivity 600x	-	41	-	-	41	-	-	41	-
Analyt. Sensitivity 300x	-	13*	-	-	13*	-	-	13*	-
Skin Fragments (1-4)	-	2	-	-	2	-	-	2	-
Fibrous Particulate (1-4)	-	1	-	-	1	-	-	1	-
Background (1-5)	-	2	-	-	1	-	-	1	-

++ Includes other spores with similar morphology; see EMSL's fungal glossary for each specific category.



Abubakar Barry, Microbiology Laboratory Manager or other Approved Signatory

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Samples analyzed by EMSL Analytical, Inc. Beltsville, MD AIHA-LAP, LLC-EMLAP Accredited #102891

Initial report from: 12/16/2020 12:08 PM



EMSL Order: 192012242 Customer ID: SALU50

Customer PO: Project ID:

 Attention:
 Indika Jayatilake
 Phone: (301) 595-3783

 SaLUT
 Fax: (301) 595-3787

1818 New York Avenue, NE Collected Date: 12/11/2020

Suite 231 Received Date: 12/11/2020 04:02 PM

Washington, DC 20002 Analyzed Date: 12/15/2020 Project: 19-035-Mt. Rainier ES

Test Report:Air-O-Cell(™) Analysis of Fungal Spores & Particulates by Optical Microscopy (Methods MICRO-SOP-201, ASTM D7391)

Lab Sample Number: Client Sample ID: Volume (L):	192012242-0004 192012242-0005 192012242-0006 S4 S5 S6 75 75 75				S5					
Sample Location:	HW Be	tween CR 10 a	nd 13	HW B	etween CR 2 ar	nd 6	Outside			
Spore Types	Raw Count	Count/M³	% of Total	Raw Count	Count/M³	% of Total	Raw Count	Count/M³	% of Total	
Alternaria (Ulocladium)	-	-	-	-	<u> </u>	-	1	40	0.3	
Ascospores	1	40	4.9	1	40	2.1	6	200	1.6	
Aspergillus/Penicillium	1	40	4.9	-	-	-	6	200	1.6	
Basidiospores	15	620	76.5	43	1800	95.7	168	6890	56.3	
Bipolaris++	-	-	-	-	-	-	-	-	-	
Chaetomium	-	-	-	-	-	-	-	-	-	
Cladosporium	3	100	12.3	1	40	2.1	34	1400	11.4	
Curvularia	-	-	-	-	-	-	-	-	-	
Epicoccum	-	-	-	-	-	-	5	200	1.6	
Fusarium	-	-	-	-	-	-	-	-	-	
Ganoderma	-	-	-	-	-	-	-	-	-	
Myxomycetes++	1*	10*	1.2	-	-	-	81	3300	27	
Pithomyces++	-	-	-	-	-	-	-	-	-	
Rust	-	-	-	-	-	-	-	-	-	
Scopulariopsis/Microascus	-	-	-	-	-	-	-	-	-	
Stachybotrys/Memnoniella	-	-	-	-	-	-	-	-	-	
Unidentifiable Spores	-	-	-	-	-	-	-	-	-	
Zygomycetes	-	-	-	-	-	-	-	-	-	
Total Fungi	21	810	100	45	1880	100	301	12230	100	
Hyphal Fragment	-	-	-	-	-	-	4	200	-	
Insect Fragment	1	40	-	1	40	-	-	-	-	
Pollen	-	-	-	-	-	-	-	-	-	
Analyt. Sensitivity 600x	-	41	-	-	41	-	-	41	-	
Analyt. Sensitivity 300x	-	13*	-	-	13*	-	-	13*	-	
Skin Fragments (1-4)	-	1	-	-	1	-	-	1	-	
Fibrous Particulate (1-4)	-	1	-	-	1	-	-	1	-	
Background (1-5)	-	1	-	-	1	-	-	1	-	

++ Includes other spores with similar morphology; see EMSL's fungal glossary for each specific category.



Abubakar Barry, Microbiology Laboratory Manager or other Approved Signatory

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Test Report:Air-O-Cell(™) Analysis of Fungal Spores & Particulates by Optical Microscopy (Methods MICRO-SOP-201, ASTM D7391)

Lab Sample Number: Client Sample ID: Volume (L): Sample Location:	1	92012242-0007 S7 Field Blank							
Spore Types	Raw Count	Count/M³	% of Total	-	-	-	-	-	-
Alternaria (Ulocladium)	-	-	· -	-		-	-	-	
Ascospores	-	-	-	-		-	-		
Aspergillus/Penicillium	-	-	-	-		-	-		
Basidiospores	-	-	-	-		-	-		
Bipolaris++	-	-	-	-		-	-		
Chaetomium	-	-	-	-		-	-		
Cladosporium	-	-	-	-		-	-		
Curvularia	-	-	-	-		-	-		
Epicoccum	-	-	-	-		-	-		
Fusarium	-	-	-	-		-	-		
Ganoderma	-	-	-	-		-	-		
Myxomycetes++	-	-	-	-		-	-		
Pithomyces++	-	-	-	-		-	-		
Rust	-	-	-	-		-	-		
Scopulariopsis/Microascus	-	-	-	-		-	-		
Stachybotrys/Memnoniella	-	-	-	-		-	-		
Unidentifiable Spores	-	-	-	-		-	-		
Zygomycetes	-	-	-	-		-	-		
Total Fungi	-	No Trace	-	-		-	-		
Hyphal Fragment	-	-	-	-		-	-		
Insect Fragment	-	-	-	-			-		
Pollen	-	-	-	-	-	-	-	-	-
Analyt. Sensitivity 600x	-	0	-	-	-	-	-	-	-
Analyt. Sensitivity 300x	-	0*	-	-		-	-		
Skin Fragments (1-4)	-	-	-	-			-		
Fibrous Particulate (1-4)	-	-	-	-		-	-		
Background (1-5)	-	-	-	-		-			

++ Includes other spores with similar morphology; see EMSL's fungal glossary for each specific category.



Abubakar Barry, Microbiology Laboratory Manager or other Approved Signatory

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Samples analyzed by EMSL Analytical, Inc. Beltsville, MD AIHA-LAP, LLC-EMLAP Accredited #102891

Initial report from: 12/16/2020 12:08 PM



# Microbiology Chain of Custody EMSL Order Number (Lab Use Only):

- 192012242

EMSL ANALYTICAL, INC. 200 ROUTE 130 NORTH CINNAMINSON, NJ 08077 PHONE: (800) 220-3675 FAX:(856) 786-0262

		<u> </u>								
Company Name:	Salut inc		EMSL-Bill to: Same Different If Bill to is Different note instructions in Comments							
1	York Avenue NE		Third Party Billing requires written authorization from third party.							
City: Washington	State/Province: DC	Zip/Postal Code: Country:								
Report To (Name)	; Indika Jayatilake		Telephone #:							
Email Address: ij	ayatilake@salutinc.com		Fax #:			Purchase Or	der:			
Project Name/Nu	mber: 19-035-Ht. Rainie	r ES	Please Provide R	esuits: [	] Fax [	] Email				
U.S. State Sample		Zip Code:	20712 Conne	ecticut Sa	mples:	Commercial	☐ Residential			
	Sterile, Sodium Thiosulfate Preserved Bottle Used:  Biocide Used in Source (specify):									
Public	Public Water Supply Samples: Note: All results may automatically be reported to DOH if required by state.  Turnaround Time (TAT) Options - Please Check									
F		<del></del>					· 			
3 Hour	☐ 6 Hour ☐ 24 Hour	48 Hour	72 Hour		Hour	☐ 1 Week	☐ 2 Week			
M001 Air-O-Cell	M174 MoldSnap		y Test Codes nonas aeruginosa (PIA	(***) I	M115 Sow	age Screen - Wa	tor (D/A***)			
M030 Micro 5	M032 Allergenco-D	M024 Pseudor	nonas aeruginosa (MF	T*)′	M116 Sew	age Screen - Wa	ter (MPN**)			
M041 Fungal Direct I			ophic Plate Count liform & <i>E. coli</i> (Coliler	t P/A***)		age Screen - Sw age Screen - Sw				
M169 Pollen ID & En	umeration	M018 Total Co	liform & E. coli (MFT*) liform & E. coli Enume	· I	M133 Meth	nicillin-resistant S				
M280 Dust Character M281 Dust Character		(Colifert MPN*	")	ration		id-growing non-T	B Mycobacteria			
M005 Viable Fungi- A	Air Samples (Genus ID & Count)	M019 Fecal Co	oliform (MFT*) reptococcus (MFT*)		Detection &	& Enumeration otoxin Analysis				
M006 Viable Fungi- A Aspergillus. Cladosor	Air Samples (Includes Penicillium, orium, Stachybotrys Species ID &	M029 Enteroco	occi (MFT*)		M044 Grou		Dog, Cockroach,			
Count)			occi (Enterolert P/A***) ne qPCR-ERMI 36 Pan	nel	Dust Mite) Other See	Analytical Price	Guide			
Count)	gi - Surface Samples (Genus ID &		Screen –Water (MFT*		Legionella	r Analysis Pleas				
	gi - Surface Samples (Includes ` lus, Cladosporium, Stachybotrys				Legionella	COC				
Species ID & Count)		*MET≃ Membr	ane Filtration Techniqu	۵۱						
	re Gram Stain & Count t & ID - 3 Most Prominent	**MPN= Most i	Probable Number	ic						
	t & ID - 5 Most Prominent	***P/A= Preser	rce/Absence							
Name of Sampler	: Shenal Dia	<u>5</u>	Signature of Sampler:							
Sample #	Sample Location/Description	Sample Type	Potable/ NonPotable (Only for Waters)	Test Code	Volume/ Area	Date/Time Collected	Temperature ('C) (Lab Use Only)			
Example A1	Kitchen Sink/Tap	Water	⊠P □NP	M017	100 mL	9/1/13 4:00 PM	:			
S1	the infront of Main entron		□P □NP	M001	75ml	12 11 20				
S2	ow introdet (intereste		□P □NP	-	n	94	3 1 N 1,			
<b>S</b> 3	AM between (R8 and 11	17	□ P □NP	и		11	9.5.			
S4	HW between CR 10 and 13	11	□ P □NP	В		m	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1			
S5	1W between 1R 2 and 6	п	□ P □NP	n		17				
Client Sample # (s	s): -	Total # of S	Samples: 07		s Receive ab Use Onl		es / No			
Relinquished (Cli	ent):		Date:		Time:	<u>~</u> <u>m</u>				
Received (Lab):	AB DIOP BO	×	Date:	]	Time:	929 B				
Comments/Specia	al Instructions:					DEC DEC	R			
							E C			
1				2			四			
	The state of the s									
	Inc.'s Laboratory Terms and Conditions		into this chain of custo			entirety. Submis	sion of samples			
-	II, Inc. constitutes acceptance and ackno	wiedgment of all	terms and conditions.	by Custome	г.	02 R	•			
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EMSL ANALYTICAL, INC. 200 ROUTE 130 NORTH CINNAMINSON, NJ 08077 PHONE: (800) 220-3675 FAX:(856) 786-0262

Additional pages of the chain of custody are only necessary if needed for additional sample information.										
Sample #	Sample Location/Description	Sample Type	Potable/ NonPotable (Only for Waters)	Test Code	Volume/ Area	Date/Time Collected	Temperature (°C) (Lab Use Only)			
S6	Outside	Air	□ P □NP	M001	75ml	12/11/26				
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Comments/Special	Instructions:		□ P □NP				<u> </u>			
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EMSL Analytical, Inc.'s Laboratory Terms and Conditions are incorporated into this chain of custody by reference in their entirety. Submission of samples to EMSL Analytical, Inc. constitutes acceptance and acknowledgment of all terms and conditions by Customer.

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