

July 5, 2019

Mr. Alex Baylor, Environmental Specialist Environmental Safety Office Prince Georges County Public Schools Division of Supporting Services / Building Services 13306 Old Marlboro Pike Upper Marlboro, MD 20772 via email: <u>alex.baylor@pgcps.org</u>

#### RE: Indoor Air Quality (IAQ) and Mold Assessment Services Benjamin Stoddert Middle School 2501 Olson Street, Temple Hills, MD 20748 Tidewater Project No.: 5419-020

Dear Mr. Baylor:

Tidewater, Inc. (Tidewater) is pleased to present this Indoor Air Quality (IAQ) and Mold Assessment Report describing the results of the IAQ assessment and mold survey conducted by Tidewater at Benjamin Stoddert Middle School located at 2501 Olson Street, Temple Hills, Maryland. The IAQ and Mold survey was conducted on May 31, 2019, by Tidewater's Project Manager and Certified Industrial Hygienist, Mr. Skanda Abeyesekere MS, CIH, CSP, CHMM.

The scope of work for the IAQ assessment and mold survey included:

- Visual inspections of the following areas of the school: Library, Gymnasium, Music Instrument Room, Multipurpose Room, Classroom 110, Classroom 121, 2<sup>nd</sup> Floor -Classroom 224, 2<sup>nd</sup> Floor - Guidance Room 227, 3<sup>rd</sup> Floor – Classroom 326 and 3<sup>rd</sup> Floor – Classroom 310 of Benjamin Stoddert Middle School for evidence of potential indoor air quality problems (including suspect microbial growth, water damage, chemical use/storage, drain traps, sources of allergens/contaminants, etc.) that may contribute to indoor air quality problems.
- Comfort parameter air testing at the above areas utilizing a direct-reading IAQ monitor for temperature (T), relative humidity (RH), carbon monoxide (CO), and carbon dioxide (CO<sub>2</sub>.) Measurements were taken for comparison with guidelines established by the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) Standard 62.1–2016, Ventilation for Acceptable Indoor Air Quality, and The United States Environmental Protection Agency (US EPA) National Ambient Air Quality Standards (NAAQS.)
- Measurement of particulate matter less than 10 microns (PM10) concentrations utilizing a direct-reading instrument at the above areas for comparison with guidelines established by the United States Environmental Protection Agency (US EPA.)
- Measurement of Total Volatile Organic Compounds (TVOCs) concentrations utilizing a direct-reading instrument at the above areas for comparison with relevant guidelines.
- Air sampling for total airborne fungal spore concentrations at the above areas using Allergenco-D cassettes affixed to a Buck BioAire<sup>™</sup> Model B520 Bioaerosol Sampling Pump.



#### Visual Observations

Tidewater's assessment included a visual inspection of selected areas of the school including the Library, Gymnasium, Music Instrument Room, Multipurpose Room, Classroom 110, Classroom 121, 2<sup>nd</sup> Floor - Classroom 224, 2<sup>nd</sup> Floor - Guidance Room 227, 3<sup>rd</sup> Floor - Classroom 326 and 3<sup>rd</sup> Floor - Classroom 310 of Benjamin Stoddert Middle School. The results of Tidewater's visual inspection are as follows:

#### Library

The Library was vacant at the time of the inspection. Two (2) wall-mounted air conditioning units were in operation at the time of the inspection. General housekeeping within the Library appeared to be satisfactory. No signs of suspect mold growth or water-intrusion problems were observed in the Library. A strong mildew odor was detected in the Library upon entry.

#### <u>Gymnasium</u>

Gymnasium was vacant at the time of the inspection. Air diffusers located on the ceiling appeared to be clean. Window-mounted air conditioning units were in operation at the time of the inspection. No signs of suspect mold growth or water intrusion problems were observed within the Gymnasium. Tidewater did not detect any unusual odors in the Gymnasium.

#### Music Instrument Room (Room 151)

Room 151 had three (3) occupants at the time of the inspection. The air conditioning unit was in operation at the time of the inspection. General housekeeping within the classroom appeared to be deficient. Multiple water-stained ceiling tiles were also observed in the Room 151. Furthermore, the supply air grills located on the ceiling appeared to contain suspect mold formations. No unusual odors were detected.

#### Multipurpose Room (Room 156)

Multipurpose Room 156 had over 50 students at the time of the inspection. Air diffusers located on the ceiling appeared to be clean. Window-mounted air conditioning units were in operation at the time of the inspection. Multiple water-stained ceiling tiles were also observed in the multipurpose room. Tidewater did not detect any unusual odors in the multi-purpose room.

#### Classroom 110

Classroom 110 was vacant at the time of the inspection. One (1) wall-mounted fan coil unit was in operation at the time of the inspection. General housekeeping within the classroom appeared to be satisfactory. The supply air grills located on the ceiling appeared to be clean. Ceiling tiles with minor water stains were observed in the classroom. No unusual odors were detected.

#### Classroom 121

Classroom 121 was vacant at the time of the inspection. One (1) wall-mounted fan coil unit was in operation at the time of the inspection. General housekeeping within the classroom appeared to be satisfactory. The supply air grills located on the ceiling appeared to be clean. Ceiling tiles with minor water stains were observed in the classroom. No unusual odors were detected.

#### 2<sup>nd</sup> Floor - Classroom 224

Classroom 224 had over 20 students at the time of the inspection. One (1) wall-mounted fan coil unit was in operation at the time of the inspection. General housekeeping within the



classroom appeared to be satisfactory. The supply air grills located on the ceiling appeared to be clean. No unusual odors were detected.

#### 2<sup>nd</sup> Floor - Guidance Room (Room 227)

Guidance Room (Room 227) was vacant at the time of the inspection. One (1) wall-mounted fan coil unit was in operation at the time of the inspection. General housekeeping within the Guidance room appeared to be satisfactory. The supply air grills located on the ceiling appeared to be clean. No unusual odors were detected.

#### <u>3<sup>rd</sup> Floor – Classroom 326</u>

Classroom 326 was vacant at the time of the inspection. One (1) wall-mounted fan coil unit was in operation at the time of the inspection. General housekeeping within the classroom appeared to be satisfactory. The supply air grills located on the ceiling appeared to be clean. No unusual odors were detected.

#### <u>3<sup>rd</sup> Floor – Classroom 310</u>

Classroom 310 was vacant at the time of the inspection. One (1) wall-mounted fan coil unit was in operation at the time of the inspection. General housekeeping within the classroom appeared to be satisfactory. The supply air grills located on the ceiling appeared to be clean. No unusual odors were detected.

#### **Comfort Parameter Air Testing**

During the assessment, Tidewater recorded temperature, relative humidity, carbon dioxide  $(CO_2)$ , and carbon monoxide (CO) measurements in the above-mentioned locations of Benjamin Stoddert Middle School using a TSI Q-Track Air Quality Meter (Model Number TSI Q-Track 7565, Serial Number 7565x0931002, Calibration Date: April 18, 2019.) Measurements were taken after allowing the instrument to become acclimated to the ambient temperature and relative humidity for approximately five (5) minutes. Measurements were taken over a 5-minute time period at each designated location and the average concentration was recorded. Samples were obtained for comparison with guidelines established by the American Society for Heating Refrigeration and Air Conditioning (ASHRAE) Standard 62.1 – 2016, Ventilation for Acceptable Indoor Air Quality. A background sample was obtained in front of the main entrance to the school building for comparison to the interior readings. The results of the IAQ comfort parameter monitoring are provided in Table 1, in **Attachment A**.

According to the American Society for Heating, Refrigerating and Air Conditioning Engineers (ASHRAE) Standard 62.1 – 2016, the temperature range in summer months should be maintained between 73.0°F and 79.0°F for maximum occupant comfort. The ASHRAE guideline for temperature for winter months is between  $68.0^{\circ}$ F and  $74.5^{\circ}$ F. The indoor temperature levels recorded in the assessed areas ranged between  $74.6^{\circ}$ F and  $78.7^{\circ}$ F. The background temperature outside the building was  $79.5^{\circ}$ F. The temperature levels recorded in all areas were within the temperature guideline recommended in ASHRAE Standard 62.1 – 2016 for summer months.

Per the same guideline, a maximum relative humidity level of 65.0% is recommended to reduce the likelihood of condensation on cold surfaces. Relative humidity levels recorded in the assessed areas ranged between 59.0% and 65.9%. The background relative humidity level outside the building was 60.1%. The relative humidity level in the Library, Multipurpose Room and Classroom 121 were marginally above the ASHRAE recommended maximum relative humidity guideline of 65.0%.



ASHRAE Standard 62.1 – 2016 recommends that indoor  $CO_2$  concentrations not exceed 700 ppm above the outdoor background  $CO_2$  level. The  $CO_2$  levels recorded in the assessed areas ranged between 450 ppm to 1,149 ppm. The background  $CO_2$  level outside the building was 420 ppm. The  $CO_2$  levels on the 2<sup>nd</sup> floor Classroom 224 exceeded 700 ppm above the outdoor background  $CO_2$  level of 420 ppm indicating inadequate air flow into this office space. These areas are highlighted in Table 1, in **Attachment A**.

The CO concentrations recorded in all of the assessed areas were below the maximum guideline of 9 ppm recommended by the Indoor Air Quality Association (IAQA) for CO in occupied indoor environments.

#### Particulate Matter Less than 10 Microns (PM 10)

Tidewater conducted air sampling for respirable dust particulates using a TSI<sup>®</sup> DUST TRAK DRX<sup>TM</sup> Aerosol Monitor (Serial Number 8534170101, Calibrated Date: March 1, 2019.) The TSI<sup>®</sup> DUST TRAK DRX<sup>TM</sup> Aerosol Monitor was equipped with a PM10 (10  $\mu$ m) respirable impactor. Measurements were taken after allowing the device to become acclimated to the ambient temperature and relative humidity for five (5) minutes. Measurements were taken over a 5-minute time period at each designated location and the average concentration was recorded. Samples were taken for comparison with guidelines established by the EPA NAAQS. Tidewater also obtained a background sample from outside the main entrance of the school building for comparison to the interior readings. The results of the particulate matter sampling are provided in Table 2, in **Attachment A**.

Based on the EPA National Ambient Air Quality Standard (NAAQS) for Particulate Matter, Final Rule (January 15, 2013), the 24-hour primary and secondary exposure standard for particulate matter less than 10 microns (PM10) is 150.0 micrograms per cubic meter of air (µg/m<sup>3</sup>) or 0.150 milligrams per cubic meter of air (mg/m<sup>3</sup>.) The results of the PM10 analysis indicate that the average PM10 dust concentration recorded in all of the assessed areas ranged between 0.012 mg/m<sup>3</sup> and 0.027 mg/m<sup>3</sup>. The average PM10 dust concentration in the background sample obtained in front of the main entrance was 0.023 mg/m<sup>3</sup>.

The results of the PM10 monitoring indicate that the PM10 dust concentration in all areas assessed were below the EPA 24-hour primary and secondary NAAQS of 0.150 mg/m<sup>3</sup>.

#### Total Volatile Organic Compound (TVOC) Air Testing

Tidewater obtained direct read measurements for Total Volatile Organic Compounds (TVOCs) using a Mini-RAE 2000 Hand Held VOC meter (Model Number MINIRAE 2000, Serial Number 110-010833, Calibration Date April 9, 2019.) Measurements were taken after allowing the device to become acclimated to the ambient temperature and relative humidity for five (5) minutes. Measurements were taken over a 5-minute time period at each sampling location and the average concentration was recorded for comparison with threshold limits recommended for typical indoor occupied environments.

A background sample was also obtained outdoors in front of the main entrance of the school building for comparison to the indoor readings. The results of the particulate matter sampling are provided in Table 3, in **Attachment A**.

There are no OSHA published guidelines for TVOCs. However, in general, the indoor air quality TVOC threshold for typical indoor occupied environments should not exceed 1,000 ppb (1.0 ppm) isobutylene units. The TVOC concentrations recorded in all of the assessed areas were below the recommended threshold level of 1.0 ppm.



#### Spore Trap Bioaerosol Sampling

On May 31, 2019, Tidewater collected a total of eleven (11) spore trap air samples using Allergenco-D cassettes to characterize potential airborne fungal spores within select areas of Benjamin Stoddert Middle School. A background sample was also collected outside the main entrance to the school building for comparison purposes.

Tidewater obtained the spore trap samples using Allergenco-D cassettes affixed to a Buck BioAire<sup>™</sup> Bioaerosol Sampling Pump (Pump Model Number B520 and Serial Number B153043, Calibration Date: February 6, 2019) calibrated to a flow rate of 15.0 Liters per minute. Each sample was run for a period of five (5) minutes at each sample location to collect a total sample volume of 75.0 liters of air.

Once collected, the samples were transported to EMSL Analytical Laboratory (EMSL) located in Beltsville, Maryland for analysis. The samples were transported following rigorous chain-ofcustody guidelines to ensure proper handling and delivery of the samples. EMSL is accredited in the American Industrial Hygiene Association (AIHA) Environmental Microbiology Laboratory Accreditation Program (EMLAP) and is a successful participant in AIHA's Environmental Microbiology Proficiency Analytical Testing (EMPAT) program (Laboratory Number 102891.)

The samples were analyzed via light microscopy at the standardized magnification of 600X. This technique does not allow for the differentiation between *Aspergillus* and *Penicillium* spores because they are morphologically identical. Additionally, the technique does not allow for cultivation, or the identification of spores to the species level, except in a few cases.

There are no universally accepted federal or State of Maryland standards for acceptable airborne concentrations of bioaerosols in an indoor occupational environment. In general, airborne concentrations indoors should be less than that found in the outdoor air, with similar species composition. Indoor spore counts significantly greater than those detected outdoors, or the presence of large numbers of different types of spores indoors that are not found outdoors, may indicate contamination and potential indoor air quality problems.

The total mold spore counts for the interior samples ranged between 8,510 and 31,380 spores per cubic meter (spores/m<sup>3</sup>.) The total mold spore concentration in the outdoors (background) sample was 43,340 spores/m<sup>3</sup>. The total mold spore concentrations in all interior locations sampled were significantly below the outdoors (background) total mold spore concentration.

Additionally, the individual fungal species concentrations observed in the interior samples were generally consistent with those observed in the background reference sample with no significant concentrations of an individual fungal species identified in the interior samples.

The summary of the results for the spore trap sampling are provided in Table 4 in **Attachment A**. The laboratory analytical results, including speciation and chain of custody forms for the spore trap samples are included in **Attachment B**.

#### Conclusions

Based on this IAQ and mold assessment survey, Tidewater offers the following conclusions:

 Tidewater's visual inspection did not reveal any evidence of standing water, active water intrusion or suspect mold growth on accessible walls, floors and ceilings in the assessed areas. Water-stained ceiling tiles were observed in Music Instrument Room (Room 151), Multipurpose Room.



- The supply air grills located on the ceiling of the Music Instrument Room (Room 151) appeared to contain dust and suspect mold growth.
- General housekeeping in all areas assessed appeared to be good apart from the Music Instrument Room (Room 151.)
- The CO, PM10, Temperature and TVOC readings recorded within the assessed areas were all within industry standards and guidelines.
- The relative humidity level in the Library, Multipurpose Room and Classroom 121 were marginally above the ASHRAE recommended maximum relative humidity guideline of 65.0%.
- The CO<sub>2</sub> levels on the 2<sup>nd</sup> floor Classroom 224 exceeded 700 ppm above the outdoor background CO<sub>2</sub> level of 420 ppm and indicates inadequate air flow into this office space.
- The mold spore concentrations in all interior locations sampled were significantly below the outdoors (background) total mold spore concentration. Additionally, the individual fungal species concentrations observed in the interior samples were generally consistent with those observed in the background reference samples with no significant concentrations of an individual fungal species identified in the interior samples.

#### Recommendations

Based on the results of the assessment, Tidewater offers the following recommendations:

- Abate the water-stained ceiling tiles in the Music Instrument Room (Room 151) and Multipurpose Room. Ensure that the perimeters of the ceiling grids are cleaned with a 10% bleach solution to mitigate exiting fungal spores prior to installing new ceiling tiles.
- Clean air supply grills located on the ceiling of the Music Instrument Room (Room 151) with a 10% bleach solution to mitigate observed dust and suspect mold growth.
- Ensure that all cleaning activities are conducted after hours when the classrooms are vacant to minimize exposure to occupants.
- Maintain good housekeeping practices in all common areas and classrooms. All common area and classroom floors should be broom cleaned at the end of each day. Furthermore, all horizontal surfaces including desktops, furniture, window sills and suspended light fixtures should be cleaned on a routine basis to prevent the accumulations of dust.
- Ensure HVAC System supplying is properly balanced per design requirements and current use/occupancy in order to ensure adequate ventilation throughout the classrooms.
- Ensure the ventilation systems are turned on in all classrooms and are operating at all times when the classrooms are occupied to provide sufficient air flow and ventilation to the classrooms.
- Install dehumidifiers or adjust the HVAC systems serving the Library, Multipurpose Room and Classroom 121 in order to achieve a relative humidity level below 65.0% per ASHRAE Standard 62.1-2016 in order to lower the probability of mold formations.



- Increase the air exchange rate on the 2<sup>nd</sup> floor Classroom 224 in order improve the air circulation within the classroom.
- Further investigation is warranted in the Library to address the strong mildew odor. This should include the Library area as well as the HVAC system supplying this area.

#### Qualifications

Tidewater has endeavored to investigate existing conditions in representative areas of Benjamin Stoddert Middle School located at 2501 Olson Street, Temple Hills, Maryland as they pertain to indoor air quality. Our conclusions and recommendations are based on the observations made on the day of our assessment, laboratory data from the time of the assessment, and information provided by both our Client and the area occupants. Actual conditions vary from day to day throughout the year.

Tidewater appreciates the opportunity to provide Industrial Hygiene consulting services for Prince Georges County Public Schools. Please contact us should any questions arise concerning this report or if we may be of further assistance.

Sincerely, Tidewater, Inc.

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Jonorhan Maka

Skanda Abeyesekere, MS, CIH, CSP, CHMM Project Manager

Jonathan N. Schatz, MS Manager, IH Services

SA/JNS

Attachments: Attachment A – Summary of Comfort Parameters, Total (Nuisance) Dust, TVOC and Non-Viable Spore Trap Sampling

Attachment B – Laboratory Reports for Non-Viable Spore Trap Sampling

Attachment C – Calibration Certificates

Attachment D – Qualifications

Attachment E – Floor Plan with Sampling Locations



Attachment A

Summary of Comfort Parameters, Total (Nuisance) Dust, TVOC and Non-Viable Spore Trap Sampling



Table 1: Indoor Air Quality Comfort Parameters         Benjamin Stoddert Middle School										
Location	Temperature (°F)	Relative Humidity (%)	Carbon Dioxide (ppm)	Carbon Monoxide (ppm)						
May 31, 2019										
Library	75.3	65.9	458	0.1						
Gymnasium	77.1	65.0	459	0.0						
Music Instrument Room	75.8	64.9	450	0.0						
Multi-Purpose Room	76.1	65.3	603	0.1						
Classroom 110	74.6	62.8	520	0.0						
Classroom 121	76.6	65.4	780	0.0						
2 <sup>nd</sup> Floor - Classroom 224	78.1	62.9	1,149	0.0						
2 <sup>nd</sup> Floor - Guidance Room 227	76.9	59.7	573	0.1						
3 <sup>rd</sup> Floor - Classroom 326	78.7	59.0	545	0.0						
3 <sup>rd</sup> Floor - Classroom 310	76.3	60.6	641	0.0						
Background	79.5	60.1	420	0.0						

 Numbers highlighted in red indicates locations in which temperature, carbon dioxide or relative humidity levels were either above or below the guidelines recommended by the American Society for Heating Refrigeration and Air Conditioning (ASHRAE) Standard 62.1 – 2016.



Table 2: Particulate Matter Less than 10 Microns (PM10)         Benjamin Stoddert Middle School							
Location	Particulate Matter (PM10)						
Location	Concentration (mg/m <sup>3</sup> )						
May 31, 2019							
Library	0.012						
Gymnasium	0.015						
Music Instrument Room	0.014						
Multi-Purpose Room	0.016						
Classroom 110	0.021						
Classroom 121	0.027						
2 <sup>nd</sup> Floor - Classroom 224	0.024						
2 <sup>nd</sup> Floor - Guidance Room 227	0.022						
3 <sup>rd</sup> Floor - Classroom 326	0.018						
3 <sup>rd</sup> Floor - Classroom 310	0.018						
Background (Outdoors)	0.023						

• Highlighted areas indicates locations where the PM0 particulate concentration exceeded the EPA 24-hour primary and secondary NAAQS of 0.150 mg/m<sup>3</sup>.



Table 3: Total Volatile Organic Compounds (TVOCs)Benjamin Stoddert Middle School									
Location	Concentration (ppm)								
May 31, 2019									
Library	0.1								
Gymnasium	0.1								
Music Instrument Room	0.0								
Multi-Purpose Room	0.0								
Classroom 110	0.0								
Classroom 121	0.0								
2 <sup>nd</sup> Floor - Classroom 224	0.0								
2 <sup>nd</sup> Floor - Guidance Room 227	0.0								
3 <sup>rd</sup> Floor - Classroom 326	0.0								
3 <sup>rd</sup> Floor - Classroom 310	0.0								
Background (Outdoors)	0.1								





	Table 4: Spore Trap Sampling Results         Benjamin Stoddert Middle School									
	May 31, 201	9								
Sample Number	Sample Location	Sample Volume (L)	Total Fungi Concentration (Counts/m <sup>3</sup> )							
BSMS-1	Library	75.0	13,840							
BSMS-2	Gymnasium	75.0	31,380							
BSMS-3	Music Instrument Room	75.0	25,050							
BSMS-4	Multi-Purpose Room	75.0	13,830							
BSMS-5	Classroom 110	75.0	19,270							
BSMS-6	Classroom 121	75.0	23,750							
BSMS-7	2 <sup>nd</sup> Floor - Classroom 224	75.0	11,990							
BSMS-8	2 <sup>nd</sup> Floor - Guidance Room 227	75.0	8,510							
BSMS-9	3 <sup>rd</sup> Floor - Classroom 326	75.0	12,300							
BSMS-10	3 <sup>rd</sup> Floor - Classroom 310	75.0	None Detected							
BG-1	Background (Outdoors)	75.0	43,340							

• Highlighted Area indicates location where the concentrations of the indoor sample exceeded the level detected in the background sample.



**Attachment B** 

### Laboratory Reports for Non-Viable Spore Trap Mold Sampling

	EMSL A	Analytica	al, Inc.				6	Drder ID:	0619	910762
EN	15L 528 Mineola Phone/Fax:							Customer ID: Customer PO	TIDE	
			<u>carleplacela</u>		<u>m</u>		(F	Project ID:		
Attn:	Skanda Abeyeskere Tidewater, Inc. 6625 Selnick Drive Suite A Elkridge, MD 21075				Fa Co Re	none: ix: bllected: eceived: nalyzed:	(410) 540 (410) 997 05/31/20 06/03/20 06/04/20	7-8713 19 19		
Proj:	Benjamin Stohard MS	5419-020								
	Test Report: Aller	genco-D(™) Ar	alysis of Fung	al Spores & P	articulates by	Optical Microsc	opy (Methods	MICRO-SOP-2	01, ASTM D739	1)
	Lab Sample Number: Client Sample ID: Volume (L): Sample Location:	(	061910762-0001 BSMS-1 75 Library	I		061910762-0002 BSMS-2 75 Gymnasium	!		061910762-0003 BSMS-3 75 ic Instrument R	
-	Spore Types	Raw Count	-	9/ of Total	Baur Count	-	9/ of Total			
	Alternaria (Ulocladium)	- Raw Count	Count/m <sup>3</sup>	% of Total	Raw Count	Count/m <sup>a</sup>	% of Total	Raw Count	Count/m <sup>3</sup>	% of Total
	Ascospores	4	200	1.4	42	1800	5.7	15	660	2.6
	Aspergillus/Penicillium	-	-	-	-	-	-	-	-	
	Basidiospores	311	13600	98.3	677	29500	94	556	24300	97
	Bipolaris++	1	40	0.3	-	-	-	-	-	-
	Chaetomium	-	-	-	-	-	-	-	-	-
	Cladosporium	-	-	-	1	40	0.1	2	90	0.4
	Curvularia	-	-	-	-	-	-	-	-	-
	Epicoccum	-	-	-	-	-	-	-	-	-
	Fusarium	-	-	-	-	-	-	-	-	-
	Ganoderma	-	-	-	-	-	-	-	-	-
	Myxomycetes++	-	-	-	-	-	-	-	-	-
	Pithomyces++	-	-	-	-	-	-	-	-	-
	Rust	-	-	-	-	-	-	-	-	-
S	copulariopsis/Microascus	-	-	-	-	-	-	-	-	-
S	tachybotrys/Memnoniella	-	-	-	-	-	-	-	-	-
	Unidentifiable Spores	-	-	-	-	-	-	-	-	-
	Zygomycetes	-	-	-	-	-	-	-	-	-
	Cercospora++	-	-	-	-	-	-	-	-	-
	Polythrincium	-	-	-	1	40	0.1	-	-	-
	Torula-like	-	-	-	-	-	-	-	-	-
	Total Fungi	316	13840	100	721	31380	100	573	25050	100
	Hyphal Fragment	1*	10*	-	-	-	-	-	-	-
	Insect Fragment	-	-	-	-	-	-	-	-	-
	Pollen	-	-	-	-	-	-	1	40	-
	Analyt. Sensitivity 600x	-	44	-	-	44	-	-	44	-
	Analyt. Sensitivity 300x	-	13*	-	-	13*	-	-	13*	-
	Skin Fragments (1-4)	-	2	-	-	1	-	-	2	-
	Fibrous Particulate (1-4)	-	1	-	-	1	-	-	1	-
	Background (1-5)	-	2	-	-	2	-	-	2	-

No discernable field blank was submitted with this group of samples.

Samples received in good condition unless otherwise noted. High levels of background particulate can obscure spores and other particulates, leading to underestimation. Background levels of 5 indicate an overloading of background particulates, prohibiting accurate detection and quantification. Present = Spores detected on overloaded samples. Results are not blank corrected unless otherwise noted. The detection limit is equal to one fungal spore, structure, pollen, fiber particle or insect fragment. "\*" Denotes particles found at 300X. "-" Denotes not detected. Due to method stopping rules, raw counts in excess of 100 are extrapolated based on the percentage analyzed. EMSL maintains liability limited to cost of analysis. This report relates only to the samples reported above and may not be reproduced, except in full, without written approval by EMSL. EMSL bears no responsibility for sample collection activities or analytical method limitations. Interpretation and use of test results are the responsibility of the client. The report relates the samples as received. When the information supplied by the customer can affect the validity of the result, it will be noted on the report. Samples analyzed by EMSL Analytical, Inc. Carle Place, NY

Initial report from: 06/05/2019 12:50:39

For Information on the fungi listed in this report please visit the Resources section at www.emsl.com Test Report SPVER3-7.30.4 Printed: 6/05/2019 12:50:39PM au

Jeffrey Lau, Microbiology Laboratory Manager

	EMSL A	Analytica	al, Inc.				6	)rder ID:	0619	10762	
	1SL 528 Mineola		arle Place, NY	1151/				ustomer ID:			
			251 / (516) 99				C	ustomer PC	):		
			carleplacelab		m		P	roject ID:			
	<u></u>	/			<u></u>						
Attn:	Skanda Abeyeskere				Ph	ione:	(410) 540	-8700			
	Tidewater, Inc.				Fa	x:	(410) 997	7-8713			
	6625 Selnick Drive				Co	ollected:	05/31/20	19			
	Suite A				Re	eceived:	06/03/20	19			
	Elkridge, MD 21075				Ar	alyzed:	06/04/20	19			
Proj:	Benjamin Stohard MS	5419-020									
	Test Report: Aller	genco-D(™) A	nalysis of Funga	I Spores & P	articulates by	Optical Microsc	opy (Methods	MICRO-SOP-2	01, ASTM D739 <sup>,</sup>	1)	
	Lab Sample Number:		061910762-0004			061910762-0005	;		061910762-0006		
	Client Sample ID:		BSMS-4			BSMS-5			BSMS-6		
	Volume (L):		75			75			75		
	Sample Location:	N	Iultipurpose Rm			Classroom 110			Classroom 121		
	Spore Types	Raw Count	Count/m <sup>3</sup>	% of Total	Raw Count	Count/m <sup>a</sup>	% of Total	Raw Count	Count/m <sup>3</sup>	% of Total	
	Alternaria (Ulocladium)	-	-	-	-	-	-	-	-	-	
	Ascospores	14	610	4.4	19	830	4.3	8	300	1.3	
	Aspergillus/Penicillium	-	-	-	-	-	-	1	40	0.2	
	Basidiospores	300	13100	94.7	418	18200	94.4	532	23200	97.7	
	Bipolaris++	-	-	-	-	-	-	-	-	-	
	Chaetomium Cladosporium	-	- 40	0.3	4	- 200	-	- 5	200	- 0.8	
	Ciadospolium Curvularia	-	-	-	-	-	-	-	200	0.0	
	Epicoccum	- 1	- 40	0.3	1	40	0.2	-	-	-	
	Fusarium	-	-	-	-	-	-		_	_	
	Ganoderma	_	-	-	_	-	-	_	-	-	
	Myxomycetes++	1	40	0.3	-	-	-	1*	10*	0	
	Pithomyces++	-	-	-	-	-	-	-	-	-	
	Rust	-	-	-	-	-	-	-	-	-	
S	copulariopsis/Microascus	-	-	-	-	-	-	-	-	-	
	tachybotrys/Memnoniella	-	-	-	-	-	-	-	-	-	
	Unidentifiable Spores	-	-	-	-	-	-	-	-	-	
	Zygomycetes	-	-	-	-	-	-	-	-	-	
	Cercospora++	-	-	-	-	-	-	-	-	-	
	Polythrincium	-	-	-	-	-	-	-	-	-	
	Torula-like	-	-	-	-	-	-	-	-	-	
	Total Fungi	317	13830	100	442	19270	100	547	23750	100	
	Hyphal Fragment	-	-	-	1	40	-	-	-	-	
	Insect Fragment	-	-	-	-	-	-	-	-	-	
	Pollen	-	-	-	-	-	-	-	-	-	
	Analyt. Sensitivity 600x	-	44	-	-	44	-	-	44	-	
	Analyt. Sensitivity 300x	-	13*	-	-	13*	-	-	13*	-	
	Skin Fragments (1-4)	-	2	-	-	2	-	-	3	-	
	Fibrous Particulate (1-4)	-	1	-	-	2	-	-	2	-	
	Background (1-5)	-	2	-	-	3	-	-	3	-	

No discernable field blank was submitted with this group of samples.

Samples received in good condition unless otherwise noted. High levels of background particulate can obscure spores and other particulates, leading to underestimation. Background levels of 5 indicate an overloading of background particulates, prohibiting accurate detection and quantification. Present = Spores detected on overloaded samples. Results are not blank corrected unless otherwise noted. The detection limit is equal to one fungal spore, structure, pollen, fiber particle or insect fragment. "\*" Denotes particles found at 300X. "-" Denotes not detected. Due to method stopping rules, raw counts in excess of 100 are extrapolated based on the percentage analyzed. EMSL maintains liability limited to cost of analysis. This report relates only to the samples reported above and may not be reproduced, except in full, without written approval by EMSL. EMSL bears no responsibility for sample collection activities or analytical method limitations. Interpretation and use of test results are the responsibility of the client. The report relates the samples as received. When the information supplied by the customer can affect the validity of the result, it will be noted on the report. Samples analyzed by EMSL Analytical, Inc. Carle Place, NY

Initial report from: 06/05/2019 12:50:39

For Information on the fungi listed in this report please visit the Resources section at www.emsl.com Test Report SPVER3-7.30.4 Printed: 6/05/2019 12:50:39PM

10Hau

Jeffrey Lau, Microbiology Laboratory Manager

	EMSL A	Analytica	al, Inc.				(	Drder ID:	0619	10762	
EN			arle Place, N				C	Customer ID: Customer PO	TIDE		
			251 / (516) 99 carleplacelat		<u>m</u>			Project ID:	•		
Attn:	Skanda Abeyeskere Tidewater, Inc. 6625 Selnick Drive Suite A Elkridge, MD 21075				Fa Co Re	none: ax: bllected: eceived: nalyzed:	(410) 540 (410) 997 05/31/20 06/03/20 06/04/20	7-8713 19 19			
Proj:	Benjamin Stohard MS	5419-020									
(	Test Report: Aller		nalveis of Funda	al Snores & P	articulates by	Ontical Microso	onv (Methods	MICRO-SOP-2	01 ASTM D730	1)	
	Lab Sample Number:	i	061910762-0007		1	061910762-0008			061910762-0009		
	Client Sample ID:		BSMS-7			BSMS-8			BSMS-9		
	Volume (L):		75			75			75		
	Sample Location:		Classroom 224		Gi	uidance Room 2	77	3rd Fl. Room 326			
	Spore Types	Raw Count	Count/m <sup>3</sup>	% of Total	Raw Count	Count/m <sup>a</sup>	% of Total	Raw Count	Count/m <sup>3</sup>	% of Total	
	Alternaria (Ulocladium)	-	-	-	-	-	-	-	-	-	
	Ascospores	14	610	5.1	12	520	6.1	4	200	1.6	
	Aspergillus/Penicillium	-	-	-	-	-	-	-	-	-	
	Basidiospores	249	10900	90.9	183	7990	93.9	275	12000	97.6	
	Bipolaris++	-	-	-	-	-	-	-	-	-	
	Chaetomium	-	-	-	-	-	-	-	-	-	
	Cladosporium	11	480	4	-	-	-	3	100	0.8	
	Curvularia	-	-	-	-	-	-	-	-	-	
	Epicoccum	-	-	-	-	-	-	-	-	-	
	Fusarium	-	-	-	-	-	-	-	-	-	
	Ganoderma	-	-	-	-	-	-	-	-	-	
	Myxomycetes++	-	-	-	-	-	-	-	-	-	
	Pithomyces++	-	-	-	-	-	-	-	-	-	
	Rust	-	-	-	-	-	-	-	-	-	
	copulariopsis/Microascus	-	-	-	-	-	-	-	-	-	
5	tachybotrys/Memnoniella	-	-		-	-	-	-	-	-	
	Unidentifiable Spores	-	-	-	-	-	-	-	-	-	
	Zygomycetes	-	-	-	-	-	-	-	-	-	
	Cercospora++ Polythrincium	-	-	-	-	-		_	-	-	
	Torula-like		-		_	-	-		-	-	
		274	44000	100	195	9540	100	282	40200	100	
	Total Fungi Hyphal Fragment	274	11990 -	100	195 2*	<b>8510</b> 30*	100	- 282	12300 -	100	
	Insect Fragment	-	-	-	-	-	-	-	-	-	
	Pollen	1*	10*	-	-	-	-	-	-	-	
	Analyt. Sensitivity 600x	-	44	-	-	44	-	-	44	-	
	Analyt. Sensitivity 300x	-	13*	-	-	13*	-	-	13*	-	
	Skin Fragments (1-4)	-	3	-	-	2	-	-	2	-	
	Fibrous Particulate (1-4)	-	2	-	-	2	-	-	2	-	
	Background (1-5)	-	3	-	-	3	-	-	2	-	

No discernable field blank was submitted with this group of samples.

Samples received in good condition unless otherwise noted. High levels of background particulate can obscure spores and other particulates, leading to underestimation. Background levels of 5 indicate an overloading of background particulates, prohibiting accurate detection and quantification. Present = Spores detected on overloaded samples. Results are not blank corrected unless otherwise noted. The detection limit is equal to one fungal spore, structure, pollen, fiber particle or insect fragment. "\*" Denotes particles found at 300X. "-" Denotes not detected. Due to method stopping rules, raw counts in excess of 100 are extrapolated based on the percentage analyzed. EMSL maintains liability limited to cost of analysis. This report relates only to the samples reported above and may not be reproduced, except in full, without written approval by EMSL. EMSL bears no responsibility for sample collection activities or analytical method limitations. Interpretation and use of test results are the responsibility of the client. The report relates the samples as received. When the information supplied by the customer can affect the validity of the result, it will be noted on the report. Samples analyzed by EMSL Analytical, Inc. Carle Place, NY

Initial report from: 06/05/2019 12:50:39

For Information on the fungi listed in this report please visit the Resources section at www.emsl.com Test Report SPVER3-7.30.4 Printed: 6/05/2019 12:50:39PM au

Jeffrey Lau, Microbiology Laboratory Manager

	EMSL A	Analytica	al, Inc.				6	Drder ID:	061	910762	$\overline{}$
EN	Phone/Fax:	(516) 997-72	arle Place, N 251 / (516) 9 <u>carleplacelal</u>	97-7528	<u>m</u>			Customer ID: Customer PO: Project ID:	TID		
Attn:	Skanda Abeyeskere Tidewater, Inc. 6625 Selnick Drive Suite A Elkridge, MD 21075				Fa Co Re	none: ax: ollected: eceived: nalyzed:	(410) 54( (410) 99 05/31/20 06/03/20 06/04/20	7-8713 19 19			
Proj:	Benjamin Stohard MS	5419-020									
	Test Report: Aller	genco-D(™) Aı	nalysis of Funga	al Spores & Pa	articulates by	Optical Microsco	opy (Methods	MICRO-SOP-20	1, ASTM D739	91)	
	Lab Sample Number: Client Sample ID: Volume (L): Sample Location:		061910762-0010 BG-1 75 Outdoors			061910762-0011 BSMS-10 75 3rd Floor					
	Spore Types	Raw Count	Count/m <sup>3</sup>	% of Total	Raw Count	Count/m <sup>a</sup>	% of Total	-		-	_
	Alternaria (Ulocladium)	1*	10*	0	-	-	-	-		-	
	Ascospores	120	5240	12.1	-	-	-	-			
	Aspergillus/Penicillium	42	1800	4.2	-	-	-	-			
	Basidiospores	792	34600	79.8	-	-	-	-			
	Bipolaris++	-	-	-	-	-	-	-			
	Chaetomium	-	-	-	-	-	-	-			_
	Cladosporium	35	1500	3.5	-	-	-	-			
	Curvularia	1	40	0.1	-	-	-	-			-
	Epicoccum	-	-	-	-	-	-	-			
	Fusarium	-	-	-	-	-	-	-			-
	Ganoderma	-	-	-	-	-	-	-			
	Myxomycetes++	-	-	-	-	-		-			
	Pithomyces++		-	-	-	-	-	-			
6	Rust	-	-	-	-	-	-	_			
	copulariopsis/Microascus stachybotrys/Memnoniella	-	-	-	-	-	-				
3	Unidentifiable Spores	-	-	-	_	-	_				
	Zygomycetes	-	-	-	_	_	_				
	Cercospora++	- 1	40	0.1	_	-	_				
	Polythrincium	3	40	0.1	_	-	_				
	Torula-like	1*	108	0.2	-	-	_				
	Total Fungi				_	- Nana Detected	_				
	Hyphal Fragment	- 996	43340	100	-	None Detected	-				
	Insect Fragment	-	-	-	_	-	-	-			
	Pollen	3*	40*	-	1	40	-				
	Analyt. Sensitivity 600x	-	44	-	-	44	-	-	-	-	
	Analyt. Sensitivity 300x	-	13*	-	-	13*	-	-			
	Skin Fragments (1-4)	-	1	-	-	1	-	-			
	Fibrous Particulate (1-4)	-	1	-	-	1	-	-			
	Background (1-5)	-	2	-	-	1	-	-			

No discernable field blank was submitted with this group of samples.

Samples received in good condition unless otherwise noted. High levels of background particulate can obscure spores and other particulates, leading to underestimation. Background levels of 5 indicate an overloading of background particulates, prohibiting accurate detection and quantification. Present = Spores detected on overloaded samples. Results are not blank corrected unless otherwise noted. The detection limit is equal to one fungal spore, structure, pollen, fiber particle or insect fragment. "\*" Denotes particles found at 300X. "-" Denotes not detected. Due to method stopping rules, raw counts in excess of 100 are extrapolated based on the percentage analyzed. EMSL maintains liability limited to cost of analysis. This report relates only to the samples reported above and may not be reproduced, except in full, without written approval by EMSL. EMSL bears no responsibility for sample collection activities or analytical method limitations. Interpretation and use of test results are the responsibility of the client. The report relates the samples as received. When the information supplied by the customer can affect the validity of the result, it will be noted on the report. Samples analyzed by EMSL Analytical, Inc. Carle Place, NY

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Jeffrey Lau, Microbiology Laboratory Manager

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

061910762

PHONE: Fax

		<i>)</i>	0100		·····			FAX:	
Company: Tidewa	ater Inc	-		EMSL-Bill to: Different Same If Bill to is Different note instructions in Comments**					
Street: 6625 Selnick	Drive, Suite A			Third Party Billing requires written authorization from third party					
City: Elkridge	Sta	te/Province:	MD	Zip/Postal Code: Country:					
	kanda Abeyesekere			Telephone #:					
	anda@tideh2o.net			Fax			Purc	chase Order:	
Project Name/Numbe	r: Benjamin St	chard N	15	Please Provide Results: FAX E-mail Mail					
U.S. State Samples Ta	aken: <sup>Maryland</sup> 59/4	7-020	•	Cor	necticut Sa	mples: 🗌	] Comme	rcial 🗌 Residential	
	Turnar	ound Time (	TAT) Optic	ns* -	Please Che	ck			
	6 Hour 🛛 🔳 24 Hour	🗌 48 Hou	ır   🗌 7	2 Ho	ur 🗌 🗌 96	Hour		leek 🔳 2 Week	
*Analysis completed in ac	cordance with EMSL's Terms a	nd Conditions I	ocated in the	e Anal	vtical Price Gu	ide. TATs	are subject	to methodology requirements	
	Non Cultura			ore T			· · · · · · · · · · · · · · · · · · ·		
<ul> <li>M001 Air-O-Cell</li> <li>M049 BioSIS</li> </ul>	<ul> <li>M173 Allegro M2</li> <li>M003 Burkard</li> </ul>	M004 A     M043 (			<ul> <li>M032 Alle</li> <li>M002 Cys</li> </ul>			M172 Versa Trap	
<ul> <li>M049 Bio3i3</li> <li>M030 Micro 5</li> </ul>	M174 MoldSnap		Relle Smart		<ul> <li>MI002 Cyl</li> <li>M130 Via</li> </ul>		1		
				_					
Other Microbiology Test Codes     M041 Fungal Direct Examination     M014 Endotoxin Analysis     M029 Enterococci									
M005 Viable Fungi ID and Count     M015 Hetero						• N	1019 Feca	I Coliform	
	ID and Count (Speciation)		Real Time C	-PCF	R-ERMI 36			A Analysis	
M007 Culturable Fu		Panel     Model	otal Colifor				1028 Cryp etection	tococcus neoformans	
<ul> <li>M008 Culturable Fu</li> <li>M009 Gram Stain C</li> </ul>			Membrane		tion)			plasma capsulatum	
M010 Bacterial Cou			ecal Strept				etection		
Prominent			Membrane					llergen Testing	
<ul> <li>M011 Bacterial Cou</li> </ul>	int and ID – 5 Most		15 Legione					p Allergen	
<ul> <li>Prominent</li> <li>M013 Sewage Cont</li> </ul>	tamination in Buildings		Recreationa Nycotoxin A					Cockroach, Dustmites) Analytical Price Guide	
Preservation Method									
Treservation method	(Mater).				7 /	7 /	î –		
	anda Abeyesekere			S	uch	- 19			
Name of Sampler:					re of Sample	er: 🥢		1	
Sample #	Sample Locatio	n	Sample Type	e 	Test Code	Volum	ne/Area	Date/Time Collected	
Example: A1	Kitchen		Air		M001	75L		1/1/12 4:00 PM	
BSMS-1	Library		Aar		M032	79	<u>,                                     </u>	05/31/19	
1-2	Gymnassum.			_		lant	•		
-3	Masce instrume	A pom	•.			Car			
-4	multiperpose i	lm.				}			
-5	classion 11	0							
-6		21							
- <del>1</del>	Clussoon 2	24							
-8	Guidance Mon								
J - 9	3rd Al- Room =				-	·			
Client Sample # (s): $\eta$				Tot	al # of Samp	les: L	μ		
Relinquished (Client)		<u> </u>	Data		<u></u>	*			
	My ask Grit	Alt h.	Date:	12	3tia	Tim	1:11	5 Mi	
Received (Client): A	· +HOW DUM - MA	a pr	Date:	<u>4</u>	<u> </u>	Tim		<u>~_ein</u>	
vəmmentə.				• /			(/	-	
							1 /		

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Page 1 of <u>2</u> pages

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

D6-1910762

PHONE: Fax:

Additional Pages of the Chain of Custody are only necessary if needed for additional sample information

Sample #	Sample Location	Sample Type	Test Code	Volume/Area	Date/Time Collected
BG-7	Sample Location Outdoors 3rd Hoor	Arr	M032	75-0	05/31/00/1
BSMS-10	3rd floor	1		75-0	
B					
		•			
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				·	
·					
· · · · · · · · · · · · · · · · · · ·					
					· · · · · · · · · · · · · · · · · · ·
			-		
	·				
**Comments/Special	Instructions:	•	•		
					$\Lambda$
				() i.m.m.	Voraid 6/4/19

Page \_\_\_\_\_ of \_\_\_\_\_ pages



**Attachment C** 

**Calibration Certificates** 



<b>Carbon Monoxi</b>	de Gas		<b>Reading ppm</b>		Acceptable	Range
35 ppm	-		35.0		(32 - 38)	-
Carbon Dioxide			Reading ppm		Acceptable	
1000 ppm			1008.0		(950 - 1050)	
Model	TSI Q-Trak 7565	-				
Widder	7565x0931002					
S/N						
Barcode	u59038x	_				
Order #	398188					
		Calibrated By	Bryce Spontak	▼		
		Date of Calibration	05/16/19			

All calibrations performed by FEI conform to manufacturer's specifications. Please report any issues within 24 hours of receiving equipment.

All calibration gas used is traceable to NIST. Additional documentation is available upon request.



### **CERTIFICATE OF CALIBRATION AND TESTING**

TSI Incorporated, 500 Cardigan Road, Shoreview, MN 55126 USA Tel: 1-800-874-2811 1-651-490-2811 Fax: 1-651-490-3824 http://www.tsi.com

Environment Conditions	TITI		Model	LLLL	8534
Temperature	76.6 (24.8)	°F (°C)	Widdel		0554
Relative Humidity	24	%RH	Serial Number		3534170101
Barometric Pressure	29.14 (986.8)	inHg (hPa)	Serial Number	TITI	5554170101
As Left			☐In Tolerance ⊠Out of Tolerance		
		Concentrati	on Linearity Plot		
	100		ATT TT T		
	(21)				
	8 10		•		
	Device Response (mg/m3) 1.0 1.0				
	I Los	U I I I	° I I I I I		
	0.1			o = In Tolerance	
				<ul> <li>= Out of Tolerance</li> <li>Tolerance : ±10%</li> </ul>	
	0.01			Toterance . ±10%	
	0.0		1 10 100 ventration (mg/m3)		
		Acrosof Com	can auon (mg/m5)		System ID: DTI101-0

FLOW AND PRESSURE VERIFICATION SYSTEM DTHO							SYSTEM DTII01-0
Parameter	Standard	Measured	Allowable Range	Parameter	Standard	Measured	Allowable Range
Flow lpm	3.0	3.0	2.85 ~ 3.15	Pressure kPa	98.6	98.6	93.71 ~ 103.57

Pump run time: 25 Hours, Pump voltage: 433 Bits

TSI Incorporated does hereby certify that all materials components, and workmanship used in the manufacture of this equipment are in strict accordance with the applicable specifications agreed upon by TSI and the customer and with all published specifications. All performance and acceptance tests required under this contract were successfully conducted according to required specifications. There is no NIST standard for optical mass measurements. Calibration of this instrument performed by TSI has been done using emery oil and has been nominally adjusted to respirable mass per standard ISO 12103-1. Al test dust (Arizona dust). Our calibration ratio is greater than 1.2:1

System ID	Last Cal.	Cal. Due	Measurement Variable	System ID	Last Cal.	Cal. Due
E005409	10-19-17	10-31-18	Temp/Humidity	E005410	10-19-17	10-31-18
E003314	05-03-17	05-31-18	DC Voltage	E003315	05-03-17	05-31-18
E003319	01-09-18	07-31-18	Microbalance	M001324	11-02-16	11-30-18
679755	n/a	n/a	3 um PSL	180387	n/a	n/a
167947	n/a	n/a	Pressure	E003511	10-02-17	10-31-18
E002471	04-20-17	04-30-18			·····································	
	E005409 E003314 E003319 679755 167947	E00540910-19-17E00331405-03-17E00331901-09-18679755n/a167947n/a	E00540910-19-1710-31-18E00331405-03-1705-31-18E00331901-09-1807-31-18679755n/an/a167947n/an/a	E005409         10-19-17         10-31-18         Temp/Humidity           E003314         05-03-17         05-31-18         DC Voltage           E003319         01-09-18         07-31-18         Microbalance           679755         n/a         n/a         3 um PSL           167947         n/a         n/a         Pressure	E005409         10-19-17         10-31-18         Temp/Humidity         E005410           E003314         05-03-17         05-31-18         DC Voltage         E003315           E003319         01-09-18         07-31-18         Microbalance         M001324           679755         n/a         n/a         3 um PSL         180387           167947         n/a         n/a         Pressure         E003511	E005409         10-19-17         10-31-18         Temp/Humidity         E005410         10-19-17           E003314         05-03-17         05-31-18         DC Voltage         E003315         05-03-17           E003319         01-09-18         07-31-18         Microbalance         M001324         11-02-16           679755         n/a         n/a         3 um PSL         180387         n/a           167947         n/a         n/a         Pressure         E003511         10-02-17

Verified

March 1, 2018

Date

### **INSTRUMENT CALIBRATION REPORT**



#### Pine Environmental Services, LLC.

#### **Tidewater MD**

Υ.	( TD 110 010022								
	ent ID 110-010833								
Desc	ription MINIRAE 20	)00							
Cali	brated 4/9/2019								
	cturer Rae Systems	······································		F	requency 6	Months			
Model N	umber MINIRAE 20	)00	Status Pass						
Serial N	umber 110-010833				Temp 24	Ļ			
Lo	cation Maryland			J	<b>Jumidity</b> 39	)			
Depa	rtment CATHY MO	ORE							
Calibration Specifications									
	Group # 1			Range	Acc % 0.00	00			
Gro	up Name ISOBUTY	LENE		0	Acc % 3.00				
Sta	ited Accy Pct of Rea	ding		-	<b>Minus</b> 0.00				
<u>Nom In Val / In Va</u>	<u>I In Type</u>	Out Val	<u>Out Type</u>	Fnd As	Lft A	<u>S Dev%</u>	Pass/Fail		
100.00 / 100.00	ppm	100.00	ppm	92.80	101.	00 1.00%	Pass		
Test Instruments Used During the Calibration (As Of Cal Entry Date)									
Test Instrument ID		<u>Manufacturer</u>	Model Num		<u>al Number /</u>		ext Cal Date /		
	MD ISO 100PPM	Pine	FBI-248-10	0-12 34L	S-248-100	5/23/2022			
100PPM		Environmental							
FBI-248-100-12		Services, Inc.							
	ZERO AIR Oxygen	Pine	31844	FBI	-1-25				
FBI-1-25	20.9%VOL, Nitrogen	Environmental							
	Balance	Services, Inc.							

Notes about this calibration

Calibration Result Calibration Successful Who Calibrated Ryan Armstrong

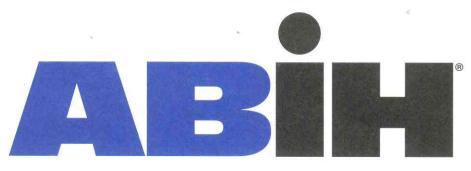
Pine Environmental Services, LLC. hereby certifies that this instrument is calibrated and functions to meet the manufacturer's specifications using NIST traceable standards, or is derived from accepted values of physical constants.





**Attachment D** 

Qualifications



## american board of industrial hygiene®

organized to improve the practice of industrial hygiene proclaims that

# Skandakumar Harshanath Abeyesekere

having met all requirements of education, experience and examination, and ongoing maintenance, is hereby certified in the

> **COMPREHENSIVE PRACTICE** of INDUSTRIAL HYGIENE

and has the right to use the designations

### **CERTIFIED INDUSTRIAL HYGIENIST**

# CIH

**Certificate Number** 

9928 CP

Awarded:

May 11, 2011

**Expiration Date:** 

December 1, 2021



Chair. ABIH

**Chief Executive Officer**. ABIH

BOARD OF CERTIFIED SAFETY PROFESSIONALS afirms that	Skandakumar Abeyesekere Has applied for, met qualifications, and passed required examination(s) and is hereby authorized to use the designation certified Safety Professional <sup>®</sup> in Comprehensive Practice	So long as this certificate is not suspended or revoked and the certificant renews this authorization amnually and meets Continuance of Certification requirements. Board of Examiners in witness whereof we have here unto set our hands and affixed the Seal of the Board this 7th Day of April, 2008	President President Secretary 20110 CSP No.

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CSP No.

6/17/2014





**Attachment E** 

**Floor Plan with Sampling Locations** 

