July 5, 2019

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

RE: Indoor Air Quality (IAQ) and Mold Assessment Services
North Forestville Elementary School
2311 Ritchie Road, Forestville, MD 20747
Tidewater Project No.: 5419-019

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 North Forestville Elementary School located at 2311 Ritchie Road in Forestville, 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, Classroom 205, Teacher's Lounge, Health Room, Classroom 210, Classroom 105, Classroom 106, and Classroom 109 of North Forestville Elementary 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_2.) 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™ Model B520 Bioaerosol Sampling Pump.

Visual Observations

Tidewater's assessment included a visual inspection of selected areas of the school including the Library, Classroom 205, Teacher's Lounge, Health Room, Classroom 210, Classroom 105, Classroom 106, and Classroom 109 of North Forestville Elementary School. The results of Tidewater's visual inspection are as follows:

Library

The Library was vacant at the time of the inspection. Two (2) window-mounted air conditioning units and two (2) wall-mounted fan coil 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. No unusual odors were detected from the Library.

Classroom 205

Classroom 205 was vacant at the time of the inspection. A window-mounted air conditioning unit was in operation at the time of the inspection. No signs of suspect mold growth or water intrusion problems were observed within the classroom. Tidewater did not detect any unusual odors in the classroom at the time of the inspection.

Classroom 208 (Teacher's Lounge)

Classroom 208 had three (3) occupants at the time of the inspection. One (1) window-mounted air conditioning unit and one (1) wall-mounted fan coil unit were in operation at the time of the inspection. General housekeeping within the classroom appeared to be satisfactory. No signs of suspect mold growth or water-intrusion problems were observed in the Library. No unusual odors were detected from the Library.

Health Room

The Health Room was vacant at the time of the inspection. The air supply grills located on the ceiling contained excessive levels of dust and suspect mold. A ceiling-mounted air conditioning unit was observed in the Health Room. The air conditioning unit was not operating at the time of the inspection. No signs of suspect mold growth or water-intrusion problems were observed in the Health Room. No unusual odors were detected in the Health Room.

Classroom 210

Classroom 210 was vacant at the time of the inspection. One (1) window-mounted air conditioning unit was in operation at the time of the inspection. One (1) wall-mounted fan coil unit was also observed in the classroom. General housekeeping within the classroom appeared to be satisfactory. A window was open allowing outside air to enter the classroom. No signs of suspect mold growth or water-intrusion problems were observed in the classroom. No unusual odors were detected.

Classroom 105

Classroom 105 was had one (1) occupant at the time of the inspection. One (1) window-mounted air conditioning unit was in operation at the time of the inspection. One (1) wall-mounted fan coil unit (non-functional) was also observed. General housekeeping within the classroom appeared to be deficient. Flaking/ peeling wall plaster/ paint was observed near the sink in the washroom. Multiple water-stained ceiling tiles were also observed in the classroom. No unusual odors were detected.

Classroom 103

Three (3) window-mounted air conditioning units were in operation at the time of the inspection. General housekeeping within the classroom appeared to be satisfactory. No signs of suspect mold growth, or prior or ongoing water-intrusion problems were observed in the classroom. No unusual odors were detected.

Classroom 109

Classroom 109 was vacant at the time of the inspection. A window-mounted air conditioning unit was in operation at the time of the inspection. The supply air grills of this air conditioning unit were dusty. General housekeeping within the classroom appeared to be deficient. No signs of suspect mold growth or water intrusion problems were observed within the classroom. A water-stained ceiling tile was observed in the classroom. Tidewater did not detect any unusual odors.

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 North Forestville Elementary 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°F and 74.5°F. The indoor temperature levels recorded in the assessed areas ranged between 71.3°F and 79.6°F. The background temperature outside the building was 82.0°F. The temperature levels recorded in the Health Room marginally exceeded the upper temperature range 79.0°F 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 36.0% and 51.0%. The background relative humidity level outside the building was 52.1%. The relative humidity level in all areas assessed were below 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 543 ppm to 1,340 ppm. The background CO_2 level outside the building was 435 ppm. The CO_2 levels in the Library and Classroom 109 exceeded 700 ppm above the outdoor background CO_2 level of 435 ppm indicating inadequate air flow into these areas. 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® DUST TRAK DRX™ Aerosol Monitor (Serial Number 8534170101, Calibrated Date: March 1, 2019.) The TSI® DUST TRAK DRX™ Aerosol Monitor was equipped with a PM10 (10 µm) 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^3) or 0.150 milligrams per cubic meter of air (mg/m^3.) The results of the PM10 analysis indicate that the average PM10 dust concentration recorded in all of the assessed areas ranged between 0.018 mg/m^3 and 0.024 mg/m^3. The average PM10 dust concentration in the background sample obtained in front of the main entrance was 0.023 mg/m^3.

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^3.

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 eight (8) spore trap air samples using Allergenco-D cassettes to characterize potential airborne fungal spores within select areas of North Forestville Elementary 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™ 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-of-custody 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 2,500 and 21,100 spores per cubic meter (spores/m^3.) The total mold spore concentration in the outdoors (background) sample was 18,090 spores/m^3. The total mold spore concentrations in Classroom 210 exceeded the outdoors (background) total mold spore concentration.

The concentration of species of the genus *Basidiospores* detected in Classroom 210 (18,700 spores /m^3) exceeded the *Basidiospores* concentration in the background sample (13,700 spores /m^3.) *Basidiospores* can be found anywhere and spread via wind. Concentrations are typically high in the background, as non-dangerous basidiospores are common outdoors. *Basidiospores* are moisture driven as their spores disseminate during rain or in times of high humidity, and often indicate the infiltration of outside air through windows or doors. As a window was open in this classroom at the time of sampling, this is likely the reason for the elevated concentration.

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 Classrooms 105 and 109. Flaking/ peeling wall plaster/ paint was also observed in Classroom 105 wash room.

- The supply air grills located on the ceiling of the Health Room appeared to contain dust and suspect mold growth. The supply grills of the window-mounted air conditioning unit in Classroom 109 contained excessive levels of dust.
- General housekeeping in all areas assessed appeared to be good apart from Classrooms 105 and 109.
- The Relative humidity, CO, PM10, and TVOC readings recorded within the assessed areas were all within industry standards and guidelines.
- The temperature levels recorded in the Health Room marginally exceeded the upper temperature range 79.0°F recommended in ASHRAE Standard 62.1 – 2016 for summer months.
- The CO_2 levels in the Library and Classroom 109 exceeded 700 ppm above the outdoor background CO_2 level of 435 ppm and indicates inadequate air flow into these office areas.
- The mold spore concentrations in all interior locations sampled apart from the Classroom 210 were significantly below the outdoors (background) total mold spore concentration. However, the mold spore concentration in Classroom 210 exceeded the outdoors (background) total mold spore concentration.
- The concentration of species of the genus *Basidiospores* detected in Classroom 210 (18,700 spores /m^3) exceeded the *Basidiospores* concentration in the background sample (13,700 spores /m^3). This is likely due to the open window in the classroom during sampling.

Recommendations

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

- Abate the water-stained ceiling tiles in Classroom 105 and 109. 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.
- Abate all flaking/ peeling wall plaster/ paint in Classroom 105 wash room.
- Clean air supply grills located on the ceiling of the Health Room and the air supply grills of the window-mounted air conditioning unit in Classroom 109 with a 10% bleach solution to mitigate observed dirt/dust.
- 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 the HVAC System supply air 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**.**
- Adjust the HVAC system serving the Health Room in order to lower the temperature and achieve a temperature level between 73.0°F and 79.0°F recommended by ASHRAE Standard 62.1-2016 for summer months.
- Increase the air exchange rate to the Library and Classroom 109 in order improve the air circulation within the classrooms.
- Ensure all windows in Classroom 210 are kept closed at all times to prevent outdoor air from entering the classroom.

Qualifications

Tidewater has endeavored to investigate existing conditions in representative areas of North Forestville Elementary School located at 2311 Ritchie Road in Forestville, 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.

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 North Forestville Elementary School				
Location	**Temperature (°F)**	**Relative Humidity (%)**	**Carbon Dioxide (ppm)**	**Carbon Monoxide (ppm)**
May 31, 2019				
Library	73.4	44.0	**1,160**	0.0
Classroom 205	74.5	38.2	543	0.0
Teacher's Lounge	73.3	36.0	870	0.0
Health Room	**79.6**	50.6	873	0.1
Classroom 210	76.5	44.0	765	0.0
Classroom 105	71.3	47.8	817	0.0
Classroom 106	75.0	51.0	837	0.0
Classroom 109	73.4	47.4	**1,340**	0.0
Background	82.0	52.1	435	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) North Forestville Elementary School	
Location	**Particulate Matter (PM10)** **Concentration (mg/m^3)**
May 31, 2019	
Library	0.018
Classroom 205	0.018
Teacher's Lounge	0.020
Health Room	0.022
Classroom 210	0.024
Classroom 105	0.024
Classroom 106	0.022
Classroom 109	0.019
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^3.

Table 3: Total Volatile Organic Compounds (TVOCs) North Forestville Elementary School	
Location	**Concentration (ppm)**
May 31, 2019	
Library	0.0
Classroom 205	0.0
Teacher's Lounge	0.0
Health Room	0.0
Classroom 210	0.0
Classroom 105	0.0
Classroom 106	0.0
Classroom 109	0.0
Background (Outdoors)	0.0

Table 4: Spore Trap Sampling Results North Forestville Elementary School			
May 31, 2019			
Sample Number	**Sample Location**	**Sample Volume (L)**	**Total Fungi Concentration (Counts/m^3)**
NFES-1	Library	75.0	2,500
NFES-2	Classroom 205	75.0	4,750
NFES-3	Teacher's Lounge	75.0	8,360
NFES-4	Health Room	75.0	8,660
NFES-5	Classroom 210	75.0	**21,100**
NFES-6	Classroom 105	75.0	11,760
NFES-7	Classroom 103	75.0	7,040
NFES-8	Classroom 109	75.0	4,280
BG-1	Background (Outdoors)	75.0	18,090

- 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 Analytical, Inc.

528 Mineola Avenue Carle Place, NY 11514
Phone/Fax: (516) 997-7251 / (516) 997-7528
http://www.EMSL.com / carleplacelab@emsl.com

Order ID: 061910759
Customer ID: TIDE50
Customer PO:
Project ID:

Attn: Skanda Abeyeskere
Tidewater, Inc.
6625 Selnick Drive
Suite A
Elkridge, MD 21075

Phone: (410) 540-8700
Fax: (410) 997-8713
Collected: 05/31/2019
Received: 06/03/2019
Analyzed: 06/05/2019

Proj: North Forestville ES 5419-019

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

Lab Sample Number:	061910759-0001			061910759-0002			061910759-0003		
Client Sample ID:	NFES-1			NFES-2			NFES-3		
Volume (L):	75			75			75		
Sample Location:	Library			Room 205			Teacher's Lounge 208		
Spore Types	Raw Count	Count/m³	% of Total	Raw Count	Count/m³	% of Total	Raw Count	Count/m³	% of Total
Alternaria (Ulocladium)	-	-	-	2*	30*	0.6	-	-	-
Ascospores	6	300	12	12	520	10.9	13	570	6.8
Aspergillus/Penicillium	4	200	8	3	100	2.1	4	200	2.4
Basidiospores	44	1900	76	93	4100	86.3	167	7290	87.2
Bipolaris++	-	-	-	-	-	-	-	-	-
Chaetomium	-	-	-	-	-	-	-	-	-
Cladosporium	3	100	4	-	-	-	6	300	3.6
Curvularia	-	-	-	-	-	-	-	-	-
Epicoccum	-	-	-	-	-	-	-	-	-
Fusarium	-	-	-	-	-	-	-	-	-
Ganoderma	-	-	-	-	-	-	-	-	-
Myxomycetes++	-	-	-	-	-	-	-	-	-
Pithomyces++	-	-	-	-	-	-	-	-	-
Rust	-	-	-	-	-	-	-	-	-
Scopulariopsis/Microascus	-	-	-	-	-	-	-	-	-
Stachybotrys/Memnoniella	-	-	-	-	-	-	-	-	-
Unidentifiable Spores	-	-	-	-	-	-	-	-	-
Zygomycetes	-	-	-	-	-	-	-	-	-
Cercospora++	-	-	-	-	-	-	-	-	-
Polythrincium	-	-	-	-	-	-	-	-	-
Total Fungi	**57**	**2500**	**100**	**110**	**4750**	**100**	**190**	**8360**	**100**
Hyphal Fragment	-	-	-	-	-	-	-	-	-
Insect Fragment	-	-	-	-	-	-	-	-	-
Pollen	-	-	-	-	-	-	-	-	-
Analyt. Sensitivity 600x	-	44	-	-	44	-	-	44	-
Analyt. Sensitivity 300x	-	13*	-	-	13*	-	-	13*	-
Skin Fragments (1-4)	-	2	-	-	2	-	-	1	-
Fibrous Particulate (1-4)	-	2	-	-	1	-	-	1	-
Background (1-5)	-	2	-	-	1	-	-	1	-

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

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

Jeffrey Lau, Microbiology Laboratory Manager
or Other Approved Signatory

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 reflects 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: 06/06/2019 08:28:23

For Information on the fungi listed in this report please visit the Resources section at www.emsl.com

EMSL Analytical, Inc.

528 Mineola Avenue Carle Place, NY 11514
Phone/Fax: (516) 997-7251 / (516) 997-7528
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Order ID: 061910759
Customer ID: TIDE50
Customer PO:
Project ID:

Attn: Skanda Abeyeskere
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6625 Selnick Drive
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Phone: (410) 540-8700
Fax: (410) 997-8713
Collected: 05/31/2019
Received: 06/03/2019
Analyzed: 06/05/2019

Proj: North Forestville ES 5419-019

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

Lab Sample Number:	061910759-0004			061910759-0005			061910759-0006		
Client Sample ID:	NFES-4			NFES-5			NFES-6		
Volume (L):	75			75			75		
Sample Location:	Health Room			Room 210			Room 105		
Spore Types	Raw Count	Count/m³	% of Total	Raw Count	Count/m³	% of Total	Raw Count	Count/m³	% of Total
Alternaria (Ulocladium)	-	-	-	-	-	-	-	-	-
Ascospores	21	920	10.6	43	1900	9	30	1300	11.1
Aspergillus/Penicillium	5	200	2.3	3	100	0.5	4	200	1.7
Basidiospores	165	7200	83.1	429	18700	88.6	224	9780	83.2
Bipolaris++	-	-	-	-	-	-	-	-	-
Chaetomium	-	-	-	-	-	-	-	-	-
Cladosporium	6	300	3.5	9	400	1.9	10	440	3.7
Curvularia	-	-	-	-	-	-	-	-	-
Epicoccum	-	-	-	-	-	-	-	-	-
Fusarium	-	-	-	-	-	-	-	-	-
Ganoderma	-	-	-	-	-	-	-	-	-
Myxomycetes++	1	40	0.5	-	-	-	1	40	0.3
Pithomyces++	-	-	-	-	-	-	-	-	-
Rust	-	-	-	-	-	-	-	-	-
Scopulariopsis/Microascus	-	-	-	-	-	-	-	-	-
Stachybotrys/Memnoniella	-	-	-	-	-	-	-	-	-
Unidentifiable Spores	-	-	-	-	-	-	-	-	-
Zygomycetes	-	-	-	-	-	-	-	-	-
Cercospora++	-	-	-	-	-	-	-	-	-
Polythrincium	-	-	-	-	-	-	-	-	-
Total Fungi	**198**	**8660**	**100**	**484**	**21100**	**100**	**269**	**11760**	**100**
Hyphal Fragment	1*	10*	-	-	-	-	4	200	-
Insect Fragment	-	-	-	-	-	-	-	-	-
Pollen	-	-	-	-	-	-	1*	10*	-
Analyt. Sensitivity 600x	-	44	-	-	44	-	-	44	-
Analyt. Sensitivity 300x	-	13*	-	-	13*	-	-	13*	-
Skin Fragments (1-4)	-	2	-	-	2	-	-	2	-
Fibrous Particulate (1-4)	-	2	-	-	2	-	-	2	-
Background (1-5)	-	2	-	-	2	-	-	2	-

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

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

Jeffrey Lau, Microbiology Laboratory Manager
or Other Approved Signatory

Initial report from: 06/06/2019 08:28:23

For Information on the fungi listed in this report please visit the Resources section at www.emsl.com

EMSL Analytical, Inc.

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http://www.EMSL.com / carleplacelab@emsl.com

Order ID: 061910759
Customer ID: TIDE50
Customer PO:
Project ID:

Attn: Skanda Abeyeskere
Tidewater, Inc.
6625 Selnick Drive
Suite A
Elkridge, MD 21075

Phone: (410) 540-8700
Fax: (410) 997-8713
Collected: 05/31/2019
Received: 06/03/2019
Analyzed: 06/05/2019

Proj: North Forestville ES 5419-019

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

Lab Sample Number:	061910759-0007			061910759-0008			061910759-0009		
Client Sample ID:	NFES-7			NFES-8			NFBG-1		
Volume (L):	75			75			75		
Sample Location:	Room 103			Room 109			Outdoors		
Spore Types	Raw Count	Count/m³	% of Total	Raw Count	Count/m³	% of Total	Raw Count	Count/m³	% of Total
Alternaria (Ulocladium)	-	-	-	-	-	-	1	40	0.2
Ascospores	9	400	5.7	4	200	4.7	66	2900	16
Aspergillus/Penicillium	73	3200	45.5	23	1000	23.4	-	-	-
Basidiospores	79	3400	48.3	69	3000	70.1	314	13700	75.7
Bipolaris++	-	-	-	-	-	-	1*	10*	0.1
Chaetomium	-	-	-	-	-	-	-	-	-
Cladosporium	-	-	-	1	40	0.9	27	1200	6.6
Curvularia	-	-	-	-	-	-	1*	10*	0.1
Epicoccum	1	40	0.6	-	-	-	2	90	0.5
Fusarium	-	-	-	-	-	-	-	-	-
Ganoderma	-	-	-	-	-	-	-	-	-
Myxomycetes++	-	-	-	-	-	-	1*	10*	0.1
Pithomyces++	-	-	-	-	-	-	-	-	-
Rust	-	-	-	-	-	-	-	-	-
Scopulariopsis/Microascus	-	-	-	1	40	0.9	-	-	-
Stachybotrys/Memnoniella	-	-	-	-	-	-	-	-	-
Unidentifiable Spores	-	-	-	-	-	-	-	-	-
Zygomycetes	-	-	-	-	-	-	-	-	-
Cercospora++	-	-	-	-	-	-	2	90	0.5
Polythrincium	-	-	-	-	-	-	1	40	0.2
Total Fungi	**162**	**7040**	**100**	**98**	**4280**	**100**	**416**	**18090**	**100**
Hyphal Fragment	2	90	-	-	-	-	-	-	-
Insect Fragment	-	-	-	-	-	-	-	-	-
Pollen	-	-	-	1*	10*	-	-	-	-
Analyt. Sensitivity 600x	-	44	-	-	44	-	-	44	-
Analyt. Sensitivity 300x	-	13*	-	-	13*	-	-	13*	-
Skin Fragments (1-4)	-	2	-	-	2	-	-	1	-
Fibrous Particulate (1-4)	-	2	-	-	2	-	-	1	-
Background (1-5)	-	2	-	-	2	-	-	2	-

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

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

Jeffrey Lau, Microbiology Laboratory Manager
or Other Approved Signatory

Initial report from: 06/06/2019 08:28:23

For Information on the fungi listed in this report please visit the Resources section at www.emsl.com

OrderID: 061910759

Microbiology Chain of Custody

EMSL Order Number (*Lab Use Only*):

061910759

PHONE:
FAX:

Company: Tidewater 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 **State/Province:** MD	**Zip/Postal Code:** **Country:**
Report To (Name): Skanda Abeyesekere	**Telephone #:**
Email Address: skanda@tideh2o.net	**Fax #:** **Purchase Order:**
Project Name/Number: North Forestville ES	**Please Provide Results:** ☐ FAX ☐ E-mail ☐ Mail
U.S. State Samples Taken: Maryland 5419-019	**Connecticut Samples:** ☐ Commercial ☐ Residential

Turnaround Time (TAT) Options* - Please Check

☐ 3 Hour ☐ 6 Hour ■ 24 Hour ☐ 48 Hour ☐ 72 Hour ☐ 96 Hour ☐ 1 Week ■ 2 Week

**Analysis completed in accordance with EMSL's Terms and Conditions located in the Analytical Price Guide. TATs are subject to methodology requirements*

Non Culturable Air Samples (Spore Traps) – Test Codes

• **M001** Air-O-Cell	• **M173** Allegro M2	• **M004** Allergenco	• **M032** Allergenco-D	• **M172** Versa Trap
• **M049** BioSIS	• **M003** Burkard	• **M043** Cyclex	• **M002** Cyclex-d	
• **M030** Micro 5	• **M174** MoldSnap	• **M176** Relle Smart	• **M130** Via-Cell	

Other Microbiology Test Codes

• **M041** Fungal Direct Examination	• **M014** Endotoxin Analysis	• **M029** *Enterococci*
• **M005** Viable Fungi ID and Count	• **M015** Heterotrophic Plate Count	• **M019** Fecal Coliform
• **M006** Viable Fungi ID and Count (Speciation)	• **M180** Real Time Q-PCR-ERMI 36	• **M133** MRSA Analysis
• **M007** Culturable Fungi	• Panel	• **M028** *Cryptococcus neoformans* Detection
• **M008** Culturable Fungi (Speciation)	• **M018** Total Coliform (Membrane Filtration)	• **M120** *Histoplasma capsulatum* Detection
• **M009** Gram Stain Culturable Bacteria	• **M020** Fecal *Streptococcus* (Membrane Filtration)	• **M033-39** Allergen Testing
• **M010** Bacterial Count and ID – 3 Most Prominent	• **M210-215** *Legionella* Detection	• **M044** Group Allergen (Cat, Dog, Cockroach, Dustmites)
• **M011** Bacterial Count and ID – 5 Most Prominent	• **M026** Recreational Water Screen	• **Other** See Analytical Price Guide
• **M013** Sewage Contamination in Buildings	• **M027** Mycotoxin Analysis	

Preservation Method (Water):

Name of Sampler: Skanda Abeyesekere **Signature of Sampler:**

Sample #	Sample Location	Sample Type	Test Code	Volume/Area	Date/Time Collected
Example: A1	Kitchen	Air	M001	75L	1/1/12 4:00 PM
NFES-1	Library	Air	M032	75-0	05/31/19
-2	Room 205				
-3	Teachers Lounge 208				
-4	Health room				
-5	Room 210				
-6	Room 105				
-7	Room 103				
-8	Room 109				
BG-1	Out doors				

Client Sample # (s): ~~10~~ 9 **Total # of Samples:** ~~10~~ 9

Relinquished (Client): **Date:** 05/31/19 **Time:** 5:30pm

Received (Client): **Date:** 6/3/19 **Time:** 1:40pm

Comments:

6/5/19

Rcvd 6/4/19 10:40 AM

Microbiology Chain of Custody

EMSL Order Number (*Lab Use Only*):

061910759

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

****Comments/Special Instructions:**

Page _____ of _____ pages

Attachment C

Calibration Certificates

FIELD ENVIRONMENTAL INSTRUMENTS, INC.
www.fieldenvironmental.com

301 Brushton Avenue
Suite A
Pittsburgh PA 15221
800-393-4009 Toll Free
(412) 436-2600 Local
(412) 436-2616 Fax

IAQ Meter Calibration Certificate

	Lot #	Expiration
Cal Standard	18-6508	4/18/2020

Carbon Monoxide Gas	**Reading ppm**	**Acceptable Range**
35 ppm	35.0	(32 - 38)

Carbon Dioxide Gas	**Reading ppm**	**Acceptable Range**
1000 ppm	1008.0	(950 - 1050)

Model	TSI Q-Trak 7565
S/N	7565x0931002
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.

TSI P/N 2300157

CERTIFICATE OF CALIBRATION AND TESTING

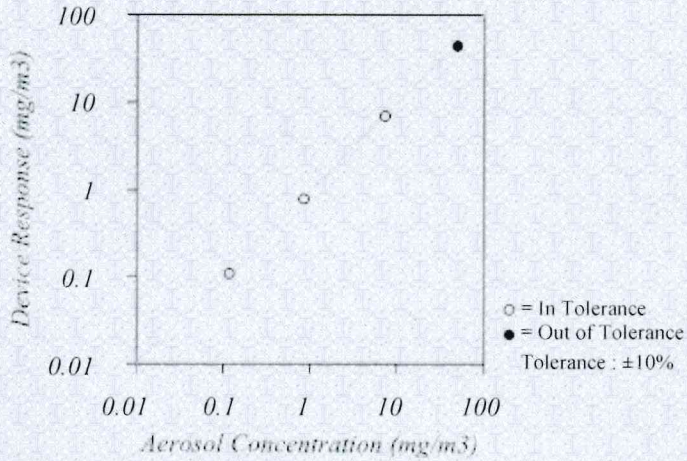
TSI Incorporated, 500 Cardigan Road, Shoreview, MN 55126 USA
Tel: 1-800-874-2811 1-651-490-2811 Fax: 1-651-490-3824 http://www.tsi.com

Environment Conditions		
Temperature	76.6 (24.8)	°F (°C)
Relative Humidity	24	%RH
Barometric Pressure	29.14 (986.8)	inHg (hPa)

Model	**8534**
Serial Number	**8534170101**

☐ As Left ☐ In Tolerance
☒ As Found ☒ Out of Tolerance

Concentration Linearity Plot



System ID: DTII01-02

FLOW AND PRESSURE VERIFICATION — **SYSTEM DTII01-02**

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, A1 test dust (Arizona dust). Our calibration ratio is greater than 1.2:1

Measurement Variable	System ID	Last Cal.	Cal. Due
Temp/Humidity	E005409	10-19-17	10-31-18
DC Voltage	E003314	05-03-17	05-31-18
Photometer	E003319	01-09-18	07-31-18
1 um PSL	679755	n/a	n/a
10 um PSL	167947	n/a	n/a
Flowmeter	E002471	04-20-17	04-30-18

Measurement Variable	System ID	Last Cal.	Cal. Due
Temp/Humidity	E005410	10-19-17	10-31-18
DC Voltage	E003315	05-03-17	05-31-18
Microbalance	M001324	11-02-16	11-30-18
3 um PSL	180387	n/a	n/a
Pressure	E003511	10-02-17	10-31-18

Verified

March 1, 2018
Date

INSTRUMENT CALIBRATION REPORT

Pine Environmental Services, LLC.

Tidewater MD

Instrument ID 110-010833
Description MINIRAE 2000
Calibrated 4/9/2019

Manufacturer Rae Systems
Model Number MINIRAE 2000
Serial Number 110-010833
Location Maryland
Department CATHY MOORE

Frequency 6 Months
Status Pass
Temp 24
Humidity 39

Calibration Specifications

Group # 1
Group Name ISOBUTYLENE
Stated Accy Pct of Reading

Range Acc % 0.0000
Reading Acc % 3.0000
Plus/Minus 0.00

Nom In Val / In Val	In Type	Out Val	Out Type	Fnd As	Lft As	Dev%	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	Description	Manufacturer	Model Number	Serial Number / Lot Number	Last Cal Date	Next Cal Date / Expiration Date
MD ISO 100PPM FBI-248-100-12	MD ISO 100PPM	Pine Environmental Services, Inc.	FBI-248-100-12	34LS-248-100	5/23/2022	
MD ZERO AIR FBI-1-25	ZERO AIR Oxygen 20.9%VOL, Nitrogen Balance	Pine Environmental Services, Inc.	31844	FBI-1-25		

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.

Certificate of Conformance

(X) Buck BioAire™ ( ) Buck BioSlide™

Serial number: B153043 **Date Issued:** 2-6-19

Flow Calibration

The instrument listed above is in conformance with factory specifications and the flow is set to nominal using a BUCK Calibrator which is N.I.S.T. traceable to A. P. Buck, Inc. Calibration Procedure APB-1, Ver. 6.2.

QA APPROVAL BY: Thomas J. Gravenor

A.P. BUCK, INC.
7101 Presidents Drive, Suite 110
Orlando, FL 32809
Phone: 407-851-8602 • Fax: 407-851-8910

BUCK
A.P. BUCK, INC.

Attachment D

Qualifications

ABIH®

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

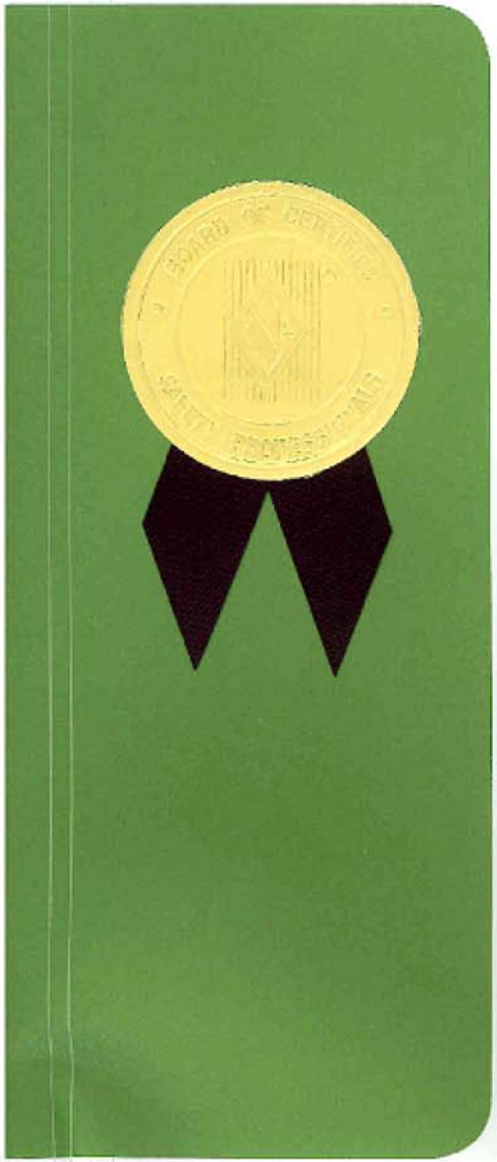
CERTIFIED INDUSTRIAL HYGIENIST

CIH®

Certificate Number	**9928 CP**
Awarded:	**May 11, 2011**
Expiration Date:	**December 1, 2021**

Susan Ripple
Chair, ABIH

Chief Executive Officer, ABIH



BOARD OF CERTIFIED SAFETY PROFESSIONALS

affirms that

Skandakumar Abeyesekere

Has applied for, met qualifications, and passed required examination(s) and is hereby authorized to use the designation

Certified Safety Professional®

in Comprehensive Practice

So long as this certificate is not suspended or revoked and the certificant renews this authorization annually 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

Paul S Adams — President

Linda Tapp — Secretary

20110 — CSP No.

INSTITUTE OF HAZARDOUS MATERIALS MANAGEMENT

THIS CERTIFIES THAT

Skandakumar Abeyeskere

HAS SUCCESSFULLY MET ALL THE REQUIREMENTS OF EDUCATION, EXPERIENCE AND EXAMINATION, AND IS HEREBY DESIGNATED A

CERTIFIED HAZARDOUS MATERIALS MANAGER
CHMM

INSTITUTE OF HAZARDOUS MATERIALS MANAGEMENT IHMM CORPORATE SEAL 1984 DISTRICT OF COLUMBIA

May 13, 2016
DATE OF CERTIFICATION

19053
CREDENTIAL NUMBER

May 31, 2021
CERTIFICATION EXPIRES

M. Patricia Buley
ACTING EXECUTIVE DIRECTOR

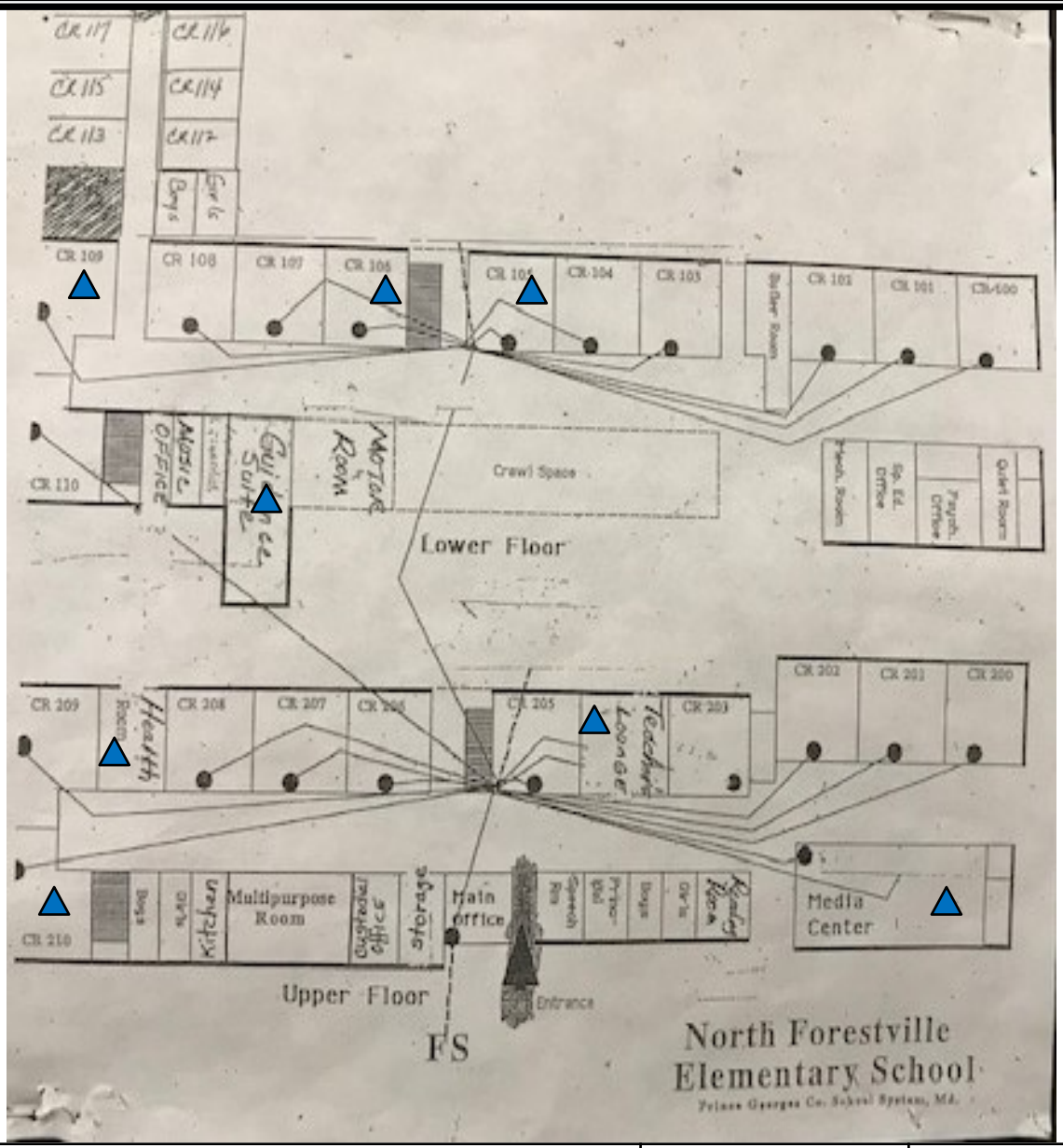
VALID SO LONG AS THIS CREDENTIAL IS RENEWED ACCORDING TO SCHEDULE AND IS NOT OTHERWISE REVOKED.

ANSI Accredited Program PERSONNEL CERTIFICATION

Accredited by the American National Standards Institute and the Council of Engineering and Scientific Specialty Boards

Attachment E

Floor Plan with Sampling Locations



TIDEWATER INC	**Attachment C** **North Forestville Elementary School** **Floor Plan with Sampling Locations**	Scale: N/A Project #: 5419-019 Date: May 31, 2019	**General Notes** ▲ = Sample Location