TIDEWATER INC ENGINEERS / SCIENTISTS / PROGRAM MANAGERS

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
James H. Harrison Elementary School
13200 Larchdale Road, Laurel, MD 20708
Tidewater Project No.: 5419-023

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 James H. Harrison Elementary School located at 13200 Larchdale Road in Laurel, Maryland. The IAQ and Mold survey was conducted on May 30, 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: Classroom 16, Cafeteria, Library, Classroom 13, Classroom 12, Classroom 9, Classroom 5, Classroom 19, and Classroom 27 of James H. Harrison 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 select areas of the school including Classroom 16, Cafeteria, Library, Classroom 13, Classroom 12, Classroom 9, Classroom 5, Classroom 19, and Classroom 27 of the James H. Harrison Elementary School. The results of Tidewater's visual inspection are as follows:

Classroom 16

Classroom 16 had two (2) wall-mounted fan coil units were observed that were not in operation at the time of the inspection. The supply and return grills located on the ceiling appeared to be dusty. No signs mold growth or water-intrusion problems were observed in the classroom. No unusual odors were detected. General housekeeping appeared to be satisfactory.

Cafeteria

The Cafeteria had over 10 students at the time of the inspection. The supply and return grills located on the ceiling appeared to be dusty. No signs mold growth or water-intrusion problems were observed in the Cafeteria; however, a water stained ceiling tile was observed. No unusual odors were detected. General housekeeping appeared to be satisfactory.

Library

The Library was vacant at the time of the inspection. The supply and return grills located on the ceiling appeared to be dusty. No signs mold growth or water-intrusion problems were observed in the Library. No unusual odors were detected. General housekeeping appeared to be satisfactory.

Classroom 13

Classroom 13 was vacant. Two (2) wall-mounted fan coil units were observed that were not in operation at the time of the inspection. The supply and return grills located on the ceiling appeared to contain rust. No signs mold growth or water-intrusion problems were observed in the classroom. No unusual odors were detected. General housekeeping appeared to be satisfactory.

Classroom 12

Classroom 12 was vacant at the time of the inspection. Classroom 12 had one (1) ceiling-mounted cooling unit and one (1) wall-mounted fan coil unit. Both units were not in operation at the time of the inspection. The supply and return grills located on the ceiling appeared to be clean. No signs mold growth or prior or water-intrusion problems were observed in the classroom. No unusual odors were detected. General housekeeping appeared to be satisfactory.

Classroom 9

Classroom 9 was vacant at the time of the inspection. Classroom 9 had one (1) wall-mounted fan coil unit that was operating at the time of the inspection. The supply and return grills located on the ceiling appeared to be clean. No signs mold growth or prior or water-intrusion problems were observed in the classroom. No unusual odors were detected. General housekeeping appeared to be satisfactory.

Classroom 5

Classroom 5 had two (3) occupants at the time of the inspection. Classroom 5 had one (1) wall-mounted fan coil unit. This unit was in operation at the time of the inspection. The supply and return grills located on the ceiling appeared to be clean. No signs mold growth or water-intrusion problems were observed in the classroom. A water-stained ceiling tile was observed in the classroom. No unusual odors were detected from the classroom. General housekeeping appeared to be satisfactory.

Classroom 22

Classroom 22 was vacant. Two (2) wall-mounted fan coil units were observed that were not in operation at the time of the inspection. No signs mold growth or prior or water-intrusion problems were observed in the classroom. No unusual odors were detected. General housekeeping appeared to be satisfactory.

Classroom 19

Classroom 19 had two (2) wall-mounted fan coil units were observed that were in operation at the time of the inspection. The supply and return grills located on the ceiling appeared to be clean. No signs mold growth or prior or ongoing water-intrusion problems were observed in the classroom. No unusual odors were detected from the classroom. General housekeeping appeared to be satisfactory.

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 James H. Harrison 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 75.9°F and 83.7°F, and the background temperature outside the building was 89.3°F. The temperature level in the Cafeteria exceeded the upper temperature guideline of 79.0°F recommended in ASHRAE Standard 62.1 – 2016 for summer months.

Per the same guideline, a maximum recommended 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 45.6% and 66.2%. The background relative humidity level outside the building was 43.0%. The relative humidity level in Classroom 22 marginally exceeded the maximum relative humidity guideline of 65.0% recommended in ASHRAE Standard 62.1 – 2016.

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 672 ppm to 1,230 ppm. The background CO_2 level outside the building was 437 ppm. The CO_2 levels in Classrooms 9 and 12 exceeded 700 ppm above the outdoor background CO_2 level of 437 ppm and indicated inadequate air exchanges to these classrooms.

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 0.010 mg/m^3 and 0.019 mg/m^3. The average PM10 dust concentration in the background sample obtained in front of the main entrance was 0.025 mg/m^3.

The results of the PM10 monitoring indicate that the PM10 dust concentrations 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 30, 2019, Tidewater collected a total of nine (9) spore trap air samples using Allergenco-D cassettes to characterize potential airborne fungal spores within select areas of James H. Harrison Elementary School. A background sample was 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 540 and 15,540 spores per cubic meter (spores/m^3.) The total mold spore concentration in the outdoors (background) sample was 12,890 spores/m^3. The total mold spore concentrations in Classroom 12 exceeded the outdoor (background) total mold spore concentration.

The concentration of species of the genus *Basidiospores* detected in the Classroom 12 (13,100 spores /m^3) was higher than the *Basidiospores* concentration detected in the background sample (8,030 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 usually indicate infiltration of outside air into the building.

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 the Cafeteria and Classroom 5.
- The supply and return grills on the ceiling in Classroom 16, the Cafeteria, the Library and Classroom 13 contained dust and/ or rust.
- General housekeeping in most classrooms appeared to be satisfactory.
- CO, PM10 and TVOC readings recorded within the assessed areas were all within industry standards and guidelines.
- The temperature level in the Cafeteria exceeded the upper temperature guideline of 79.0°F recommended in ASHRAE Standard 62.1 – 2016 for summer months.
- The relative humidity level in Classroom 22 marginally exceeded the maximum relative humidity guideline of 65.0% recommended in ASHRAE Standard 62.1 – 2016.
- The background CO_2 level outside the building was 437 ppm. The CO_2 levels in Classrooms 9 and 12 exceeded 700 ppm above the outdoor background CO_2 level and indicated inadequate air exchanges to these classrooms.
- The total mold spore concentrations in Classroom 12 exceeded the outdoor (background) total mold spore concentration.
- Species of the genus *Basidiospores* detected in Classroom 12 (13,100 spores /m^3) was higher than the *Basidiospores* concentration detected in the background sample (8,030 spores /m^3).

Recommendations

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

- Abate the water-stained ceiling tiles in the Cafeteria and Classroom 5. Ensure that the perimeters of the ceiling grids are cleaned with a 10% bleach solution to eliminate exiting fungal spores prior to installing new ceiling tiles.
- Clean air supply grills and return air grills in Classroom 16, the Cafeteria, the Library and Classroom 13 with a 10% bleach solution to mitigate dust deposits.
- Ensure that all cleaning activities are conducted after hours when the above areas are vacant to minimize exposure to occupants.
- Maintain good housekeeping practices in all common areas and classrooms. All common area and classrooms 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**.**
- Adjust the HVAC system in the Cafeteria to achieve a temperature level recommended by ASHRAE Standard 62.1 – 2016 (73.0°F and 79.0°F.)
- Install a de-humidifier or adjust the thermostat in the HVAC systems in Classroom 22 in order to maintain a relative humidity level below 65.0% per ASHRAE recommendations to minimize the potential for mold formations.
- Increase the air exchange rates to Classroom 9 and Classroom 12 in order to improve the air circulation within the classrooms.
- It is recommended that the Classroom 12 is re-tested for total mold spores after all cleaning activities are complete.

Qualifications

Tidewater has endeavored to investigate existing conditions in representative areas of the James H. Harrison Elementary School located at 2000 Callaway Street in 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.

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

6625 Selnick Drive, Suite A, Elkridge, MD 21075 Phone 410-540-8700 Fax 410-579-1685 www.tideh2o.net

Table 1: Indoor Air Quality Comfort Parameters James H. Harrison Elementary School				
Location	**Temperature (°F)**	**Relative Humidity (%)**	**Carbon Dioxide (ppm)**	**Carbon Monoxide (ppm)**
May 30, 2019				
Classroom 16	78.5	57.6	890	0.0
Cafeteria	**83.7**	45.6	836	0.0
Library	76.6	61.5	870	0.0
Classroom 13	78.0	57.3	895	0.0
Classroom 12	77.7	53.2	**1,164**	0.0
Classroom 9	77.6	57.7	**1,230**	0.0
Classroom 5	76.4	62.8	964	0.0
Classroom 19	76.1	64.4	792	0.0
Classroom 22	75.9	**66.2**	672	0.0
Background	89.3	43.0	437	0.0

- Numbers highlighted in red indicates locations in which relative humidity level exceeded 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) James H. Harrison Elementary School	
Location	**Particulate Matter (PM10)** **Concentration (mg/m^3)**
May 30, 2019	
Classroom 16	0.013
Cafeteria	0.017
Library	0.014
Classroom 13	0.013
Classroom 12	0.010
Classroom 9	0.017
Classroom 5	0.019
Classroom 19	0.016
Classroom 22	0.016
Background (Outdoors)	0.025

- Numbers highlighted in red indicates locations where PM10 dust concentration exceeded the EPA 24-hour primary and secondary NAAQS of 0.150 mg/m^3.

Table 3: Total Volatile Organic Compounds (TVOCs) James H. Harrison Elementary School	
Location	**Concentration (ppm)**
May 30, 2019	
Classroom 16	0.0
Cafeteria	0.0
Library	0.0
Classroom 13	0.0
Classroom 12	0.0
Classroom 9	0.0
Classroom 5	0.0
Classroom 19	0.0
Classroom 22	0.0
Background (Outdoors)	0.0

Table 4: Spore Trap Sampling Results James H. Harrison Elementary School			
May 30, 2019			
Sample Number	**Sample Location**	**Sample Volume (L)**	**Total Fungi Concentration (Counts/m^3)**
JHES-1	Classroom 16	75.0	660
JHES-2	Cafeteria	75.0	2,240
JHES-3	Library	75.0	3,630
JHES-4	Classroom 13	75.0	7,860
JHES-5	Classroom 12	75.0	**15,540**
JHES-6	Classroom 9	75.0	1,270
JHES-7	Classroom 5	75.0	1,010
JHES-9	Classroom 19	75.0	610
JHES-8	Classroom 22	75.0	540
BG-1	Background (Outdoors)	75.0	12,890

- 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: 061910760
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: 05/30/2019
Received: 06/03/2019
Analyzed: 06/05/2019

Proj: PGCPS James Harrison ES 5419-024

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

Lab Sample Number:	061910760-0001			061910760-0002			061910760-0003		
Client Sample ID:	JHES-1			JHES-2			JHES-3		
Volume (L):	75			75			75		
Sample Location:	Classroom 16			Cafeteria			Library		
Spore Types	Raw Count	Count/m³	% of Total	Raw Count	Count/m³	% of Total	Raw Count	Count/m³	% of Total
Alternaria (Ulocladium)	-	-	-	-	-	-	-	-	-
Ascospores	-	-	-	5	200	8.9	9	400	11
Aspergillus/Penicillium	-	-	-	-	-	-	1	40	1.1
Basidiospores	15	660	100	45	2000	89.3	71	3100	85.4
Bipolaris++	-	-	-	-	-	-	-	-	-
Chaetomium	-	-	-	-	-	-	-	-	-
Cladosporium	-	-	-	1	40	1.8	2	90	2.5
Curvularia	-	-	-	-	-	-	-	-	-
Epicoccum	-	-	-	-	-	-	-	-	-
Fusarium	-	-	-	-	-	-	-	-	-
Ganoderma	-	-	-	-	-	-	-	-	-
Myxomycetes++	-	-	-	-	-	-	-	-	-
Pithomyces++	-	-	-	-	-	-	-	-	-
Rust	-	-	-	-	-	-	-	-	-
Scopulariopsis/Microascus	-	-	-	-	-	-	-	-	-
Stachybotrys/Memnoniella	-	-	-	-	-	-	-	-	-
Unidentifiable Spores	-	-	-	-	-	-	-	-	-
Zygomycetes	-	-	-	-	-	-	-	-	-
Polythrincium	-	-	-	-	-	-	-	-	-
Triadelphia	-	-	-	-	-	-	-	-	-
Total Fungi	**15**	**660**	**100**	**51**	**2240**	**100**	**83**	**3630**	**100**
Hyphal Fragment	-	-	-	-	-	-	-	-	-
Insect Fragment	-	-	-	-	-	-	-	-	-
Pollen	-	-	-	-	-	-	-	-	-
Analyt. Sensitivity 600x	-	44	-	-	44	-	-	44	-
Analyt. Sensitivity 300x	-	13*	-	-	13*	-	-	13*	-
Skin Fragments (1-4)	-	1	-	-	2	-	-	1	-
Fibrous Particulate (1-4)	-	1	-	-	1	-	-	1	-
Background (1-5)	-	1	-	-	2	-	-	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

Initial report from: 06/06/2019 08:27:22

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

Order ID: 061910760
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Attn: Skanda Abeyeskere
Tidewater, Inc.
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Elkridge, MD 21075

Phone: (410) 540-8700
Fax: (410) 997-8713
Collected: 05/30/2019
Received: 06/03/2019
Analyzed: 06/05/2019

Proj: PGCPS James Harrison ES 5419-024

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

Lab Sample Number:	061910760-0004			061910760-0005			061910760-0006		
Client Sample ID:	JHES-4			JHES-5			JHES-6		
Volume (L):	75			75			75		
Sample Location:	Classroom 13			Classroom 12			Classroom 9		
Spore Types	Raw Count	Count/m³	% of Total	Raw Count	Count/m³	% of Total	Raw Count	Count/m³	% of Total
Alternaria (Ulocladium)	-	-	-	1	40	0.3	-	-	-
Ascospores	23	1000	12.7	46	2000	12.9	4	200	15.7
Aspergillus/Penicillium	-	-	-	2	90	0.6	-	-	-
Basidiospores	154	6720	85.5	300	13100	84.3	23	1000	78.7
Bipolaris++	-	-	-	-	-	-	-	-	-
Chaetomium	-	-	-	-	-	-	-	-	-
Cladosporium	2	90	1.1	6	300	1.9	1	40	3.1
Curvularia	-	-	-	-	-	-	-	-	-
Epicoccum	-	-	-	-	-	-	-	-	-
Fusarium	-	-	-	-	-	-	-	-	-
Ganoderma	-	-	-	-	-	-	-	-	-
Myxomycetes++	1*	10*	0.1	-	-	-	2*	30*	2.4
Pithomyces++	-	-	-	-	-	-	-	-	-
Rust	-	-	-	-	-	-	-	-	-
Scopulariopsis/Microascus	1	40	0.5	-	-	-	-	-	-
Stachybotrys/Memnoniella	-	-	-	-	-	-	-	-	-
Unidentifiable Spores	-	-	-	-	-	-	-	-	-
Zygomycetes	-	-	-	-	-	-	-	-	-
Polythrincium	-	-	-	1*	10*	0.1	-	-	-
Triadelphia	-	-	-	-	-	-	-	-	-
Total Fungi	**181**	**7860**	**100**	**356**	**15540**	**100**	**30**	**1270**	**100**
Hyphal Fragment	2	90	-	1	40	-	-	-	-
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	-	-	1	-
Background (1-5)	-	2	-	-	2	-	-	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

Initial report from: 06/06/2019 08:27:22

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

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Phone/Fax: (516) 997-7251 / (516) 997-7528
http://www.EMSL.com / carleplacelab@emsl.com

Order ID: 061910760
Customer ID: TIDE50
Customer PO:
Project ID:

Attn: Skanda Abeyeskere
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Phone: (410) 540-8700
Fax: (410) 997-8713
Collected: 05/30/2019
Received: 06/03/2019
Analyzed: 06/05/2019

Proj: PGCPS James Harrison ES 5419-024

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

Lab Sample Number:	061910760-0007			061910760-0008			061910760-0009		
Client Sample ID:	JHES-7			JHES-8			JHES-9		
Volume (L):	75			75			75		
Sample Location:	Classroom 5			Classroom 22			Classroom 19		
Spore Types	Raw Count	Count/m³	% of Total	Raw Count	Count/m³	% of Total	Raw Count	Count/m³	% of Total
Alternaria (Ulocladium)	-	-	-	-	-	-	-	-	-
Ascospores	1	40	4	4	200	37	-	-	-
Aspergillus/Penicillium	1	40	4	1	40	7.4	3	100	16.4
Basidiospores	19	830	82.2	7	300	55.6	9	400	65.6
Bipolaris++	-	-	-	-	-	-	-	-	-
Chaetomium	-	-	-	-	-	-	-	-	-
Cladosporium	2	90	8.9	-	-	-	3	100	16.4
Curvularia	-	-	-	-	-	-	-	-	-
Epicoccum	-	-	-	-	-	-	-	-	-
Fusarium	-	-	-	-	-	-	-	-	-
Ganoderma	-	-	-	-	-	-	-	-	-
Myxomycetes++	-	-	-	-	-	-	1*	10*	1.6
Pithomyces++	-	-	-	-	-	-	-	-	-
Rust	-	-	-	-	-	-	-	-	-
Scopulariopsis/Microascus	-	-	-	-	-	-	-	-	-
Stachybotrys/Memnoniella	-	-	-	-	-	-	-	-	-
Unidentifiable Spores	-	-	-	-	-	-	-	-	-
Zygomycetes	-	-	-	-	-	-	-	-	-
Polythrincium	-	-	-	-	-	-	-	-	-
Triadelphia	1*	10*	1	-	-	-	-	-	-
Total Fungi	**24**	**1010**	**100**	**12**	**540**	**100**	**16**	**610**	**100**
Hyphal Fragment	-	-	-	-	-	-	-	-	-
Insect Fragment	-	-	-	-	-	-	-	-	-
Pollen	-	-	-	-	-	-	-	-	-
Analyt. Sensitivity 600x	-	44	-	-	44	-	-	44	-
Analyt. Sensitivity 300x	-	13*	-	-	13*	-	-	13*	-
Skin Fragments (1-4)	-	2	-	-	1	-	-	1	-
Fibrous Particulate (1-4)	-	1	-	-	1	-	-	1	-
Background (1-5)	-	1	-	-	1	-	-	1	-

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

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 08:27:22

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

Order ID: 061910760
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: 05/30/2019
Received: 06/03/2019
Analyzed: 06/05/2019

Proj: PGCPS James Harrison ES 5419-024

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

Lab Sample Number:	**061910760-0010**								
Client Sample ID:	**BG-1**								
Volume (L):	**75**								
Sample Location:	**Background**								
Spore Types	**Raw Count**	**Count/m³**	**% of Total**						
Alternaria (Ulocladium)	1*	10*	0.1						
Ascospores	80	3500	27.2						
Aspergillus/Penicillium	1	40	0.3						
Basidiospores	184	8030	62.3						
Bipolaris++	-	-	-						
Chaetomium	-	-	-						
Cladosporium	23	1000	7.8						
Curvularia	-	-	-						
Epicoccum	7	300	2.3						
Fusarium	-	-	-						
Ganoderma	-	-	-						
Myxomycetes++	-	-	-						
Pithomyces++	1*	10*	0.1						
Rust	-	-	-						
Scopulariopsis/Microascus	-	-	-						
Stachybotrys/Memnoniella	-	-	-						
Unidentifiable Spores	-	-	-						
Zygomycetes	-	-	-						
Polythrincium	-	-	-						
Triadelphia	-	-	-						
Total Fungi	**297**	**12890**	**100**						
Hyphal Fragment	2	90	-						
Insect Fragment	-	-	-						
Pollen	2	90	-						
Analyt. Sensitivity 600x	-	44	-						
Analyt. Sensitivity 300x	-	13*	-						
Skin Fragments (1-4)	-	1	-						
Fibrous Particulate (1-4)	-	1	-						
Background (1-5)	-	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 08:27:22

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

OrderID: 061910760

Microbiology Chain of Custody

EMSL Order Number (*Lab Use Only*):

061910760

PHONE:
FAX:

Company: Tidewater Inc.	**EMSL-Bill to:** ☐ Different ☐ Same If Bill to is Different note instructions in Comments** *Third Party Billing requires written authorization from third party*
Street: 6625 Slenick Drive, Suite A	
City: Elkridge **State/Province:** Maryland	**Zip/Postal Code:** **Country:**
Report To (Name): Skanda Abeyesekere	**Telephone #:**
Email Address: skanda@tideh2o.net	**Fax #:** **Purchase Order:**
Project Name/Number: PGCPS James Harrison ES 5419 - 024	**Please Provide Results:** ☐ FAX ☐ E-mail ☐ Mail
U.S. State Samples Taken: MD	**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 • **M049** BioSIS • **M030** Micro 5	• **M173** Allegro M2 • **M003** Burkard • **M174** MoldSnap	• **M004** Allergenco • **M043** Cyclex • **M176** Relle Smart	• **M032** Allergenco-D • **M002** Cyclex-d • **M130** Via-Cell	• **M172** Versa Trap

Other Microbiology Test Codes

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

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
JHES-1	classroom 16	AIR	M032	75.0L	05/30/19
-2	Cafeteria				
-3	Library				
-4	classroom 13				
-5	classroom 12				
-6	classroom 9				
-7	classroom 5				
-8	classroom 22				
-9	classroom 19				

Client Sample # (s): 1 - 9 **Total # of Samples:** 9

Relinquished (Client): **Date:** 05/30/19 **Time:** 1:30pm

Received (Client): **Date:** 6/3/19 **Time:** 1:45pm

Comments:

6/5/19

OrderID: 061910760

Microbiology Chain of Custody

EMSL Order Number (*Lab Use Only*):

061910760

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-1	Background	Air	M032 (F)	75.0	05/30/2019

****Comments/Special Instructions:**

Page 2 of 2 pages

6/5/19

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

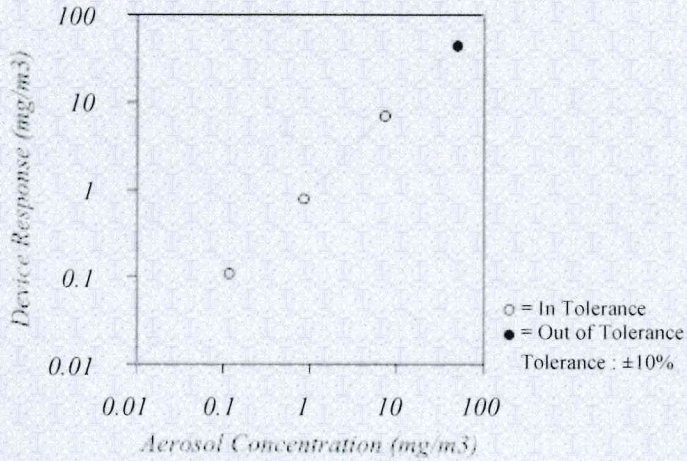
TSI Incorporated, 500 Cardigan Road, Shoreview, MN 55126 USA
Tel: 1-800-874-2811 1-651-490-2811 Fax: 1-651-490-3824 http://www.tsi.com

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

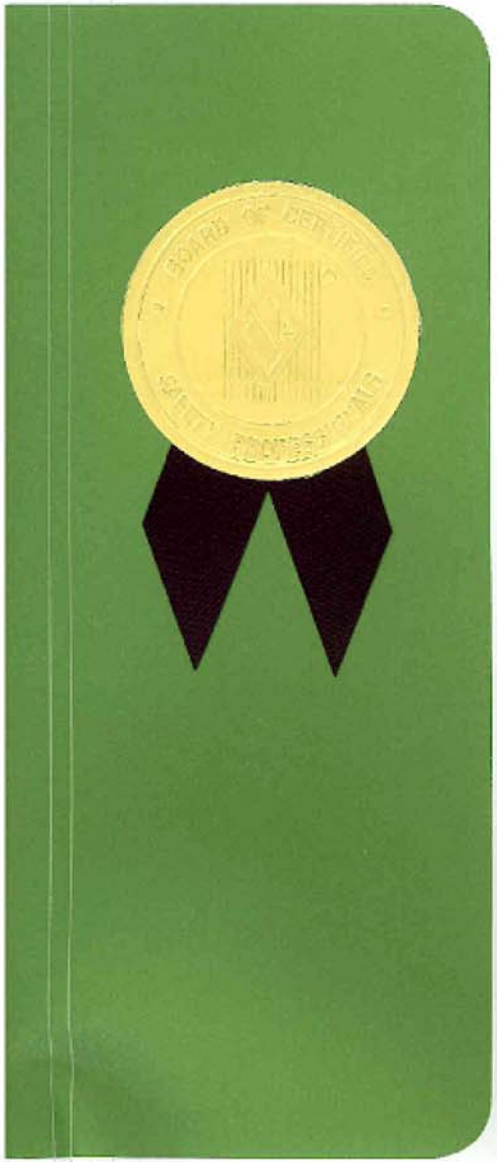
CERTIFIED INDUSTRIAL HYGIENIST

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

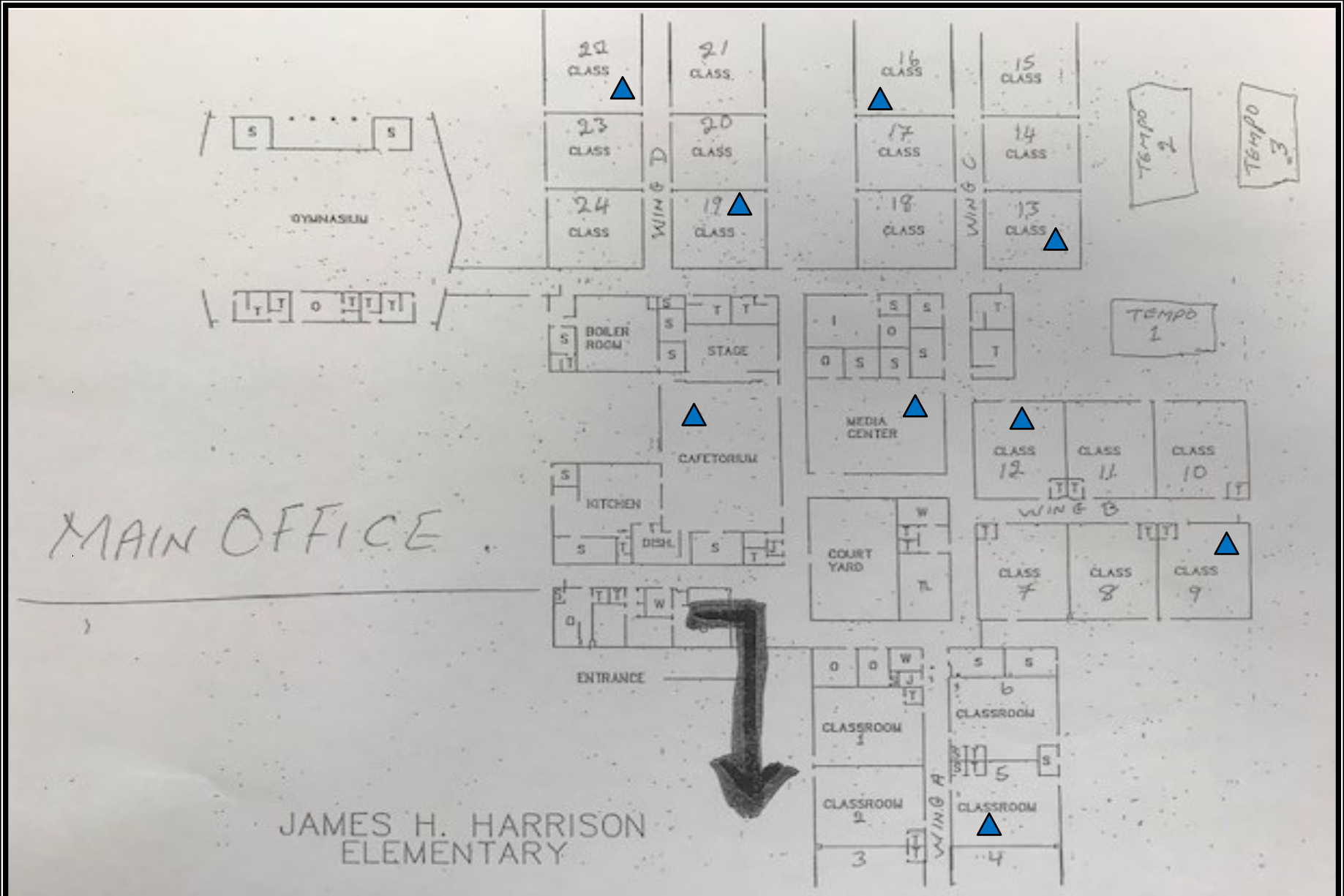
VALID SO LONG AS THIS CREDENTIAL IS RENEWED ACCORDING TO SCHEDULE AND IS NOT OTHERWISE REVOKED.

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** **James H. Harrison Elementary School** **Floor Plan with Sampling Locations**	Scale: N/A Project #: 5419-024 Date: May 30, 2019	**General Notes** ▲ = Sample Location