Providing Quality Service
Since 1994

Midwest Environmental Consulting Services, Inc.

Consultants ◂ Engineers ◂ Scientists

IAQ & MOLD
AIR SAMPLING REPORT

Performed for:

NORTH BOONE CUSD #200
17641 Poplar Grove Road, Suite A
Poplar Grove, IL 61065

Project Location:

NORTH BOONE CUSD #200
DISTRICT OFFICE
17641 Poplar Grove Road, Suite A
Poplar Grove, IL 61065

Visit Date: April 23 – 30, 2015
Report Date: May 1, 2015

MEC Project #: 15-04-222-I.H.

4 Bonnie Lane · Yorkville, Illinois 60560 · Phone: 630 · 553 · 3989 · Fax: 630 · 553 · 3990
www.mec-us.com

EXECUTIVE SUMMARY

Midwest Environmental Consulting Services, Inc. (MEC) was retained to provide indoor air quality monitoring and non-viable mold air sampling within select areas at the District Office (located at 17641 Poplar Grove Road in Poplar Grove, Illinois) to determine whether these common air quality parameters were consistent with regulatory and industry standards.

Testing included monitoring and recording the ambient air temperature, percent relative humidity, carbon dioxide, and carbon monoxide levels.

Indoor air quality monitoring and recording was performed from April 23 – 30, 2015. Non-viable mold air sampling was performed on April 23, 2015.

- *Ambient Temperature, Percent Relative Humidity, CO_2, and CO measuring/recording*

Based on results obtained during this visit, no recommendations are considered necessary regarding ambient air temperature, percent relative humidity, carbon dioxide, or carbon monoxide.

- *Airborne Mold Spore Sampling*

Based on this visit, the following conclusions are reached:

- Independent source(s) of airborne molds were considered present at the District Office.
- Disproportionate concentrations of *Aspergillus/Penicillium* (molds commonly associated with the presence of moisture impacted building materials) were detected in each sample collected, excepting the Attic sample.

Based on these conclusions, the following recommendations are provided:

- Address all source of uncontrolled moisture impacting the building.
- Ensure that existing building materials are (and remain) satisfactorily dry.
- Remediate the District Office in conformance with IDPH/AIHA guidelines. Remediation should include the use of HEPA filtered vacuuming and damp cleaning methods to remove all dusts to the extent feasible.
- Provide for independent visual inspection and follow-up testing to determine the effectiveness of remediation activities.
- Inform and educate building users to report any instance of uncontrolled water to building authorities as soon as possible. Building authorities should address any report of uncontrolled water as an urgent matter requiring prompt action to control the water and dry/replace any impacted building materials and/or furnishings as needed.

INTRODUCTION

Midwest Environmental Consulting Services, Inc. (MEC) was retained to provide indoor air quality monitoring and non-viable mold air sampling within select areas at the District Office (located at 17641 Poplar Grove Road in Poplar Grove, Illinois) to determine whether these common air quality parameters were consistent with regulatory and industry standards.

Testing included monitoring and recording the ambient air temperature, percent relative humidity, carbon dioxide, and carbon monoxide levels.

Indoor air quality monitoring and recording was performed from April 23 – 30, 2015. Non-viable mold air sampling was performed on April 23, 2015.

MEC was represented during the subject visits by David W. Sloman, CIH.

METHODS

- *Ambient Temperature, Percent Relative Humidity, CO_2, and CO measuring/recording*

Ambient air temperature, percent relative humidity, CO_2, and CO measurements were performed using a Q-Trak® real time indoor air quality monitor (Model 7565 or equivalent) manufactured by TSI Incorporated, Shorewood, MN. This instrument was programmed to collect data over an approximate 1-week time period. Once data collection was completed, the instrument was downloaded to a computer and its output was printed.

- *Airborne Mold Spore Sampling*

The spore trap air sampling was performed using a high volume air-sampling pump attached to an Air-O-Cell cassette provided by Zefon Corporation containing a tacky substance used to trap mold spores from air on through the method of impaction. For this sampling, pumps operated for approximately five minutes in each location at 15 liters per minute, according to manufacturer's recommendations. The air sampling process impacts particulates (including mold fragments) onto the Air-O-Cell cassette, which is then forwarded to a laboratory for microbial identification.

An independent laboratory (STAT Analysis Corporation, Chicago, Illinois.) accredited by the American Industrial Hygiene Association (AIHA) was used for all microscopic identification.

RESULTS

- *Ambient Temperature, Percent Relative Humidity, CO_2, and CO measuring/recording*

The table below displays a summary of the results provided by the Q-Trak monitoring. The table lists the indoor air quality parameters, the average recorded values, as well as the minimum and maximum values recorded.

	Air Temperature °F	Relative Humidity (%)	CO_2 (ppm)[1]	CO (ppm)[1]
Average	72.8	26.0	506	0.0
Range	67.9-76.3	16.2-30.9	409-1187	0-0.1

[1]'ppm' means parts of contaminant per million parts of air by volume.
A graph and statistics regarding the Q-Trak monitoring are provided in Appendix 1.

Of note, the highest CO_2 measurements were recorded during the initial start-up and instrument stabilization period.

- *Airborne Mold Spore Results*

The table below display the results of the airborne mold spore sampling. The table displays the sample ID number, sampled location, types of spores detected, their concentration, and their percent of the total spores detected in the respective sample.

Sample ID Number	Sampled Location	Type of Mold Detected	Concentration (counts/m^3)	Percent of the Total Molds
21139359	Transportation Office by Dispatch	Aspergillus/Penicillium	320	55.8
		Basidiospores	27	4.7
		Cladosporium	67	11.6
		Smuts/Myxomycetes	160	27.9
21137476	Reception Area	Aspergillus/Penicillium	120	39.1
		Basidiospores	27	8.7
		Cladosporium	67	21.7
		Epicoccum	13	4.3
		Rusts	13	4.3
		Smuts/Myxomycetes	67	21.7
21137560	Superintendent's Office	Aspergillus/Penicillium	107	47.1
		Basidiospores	27	11.8
		Cladosporium	13	5.9
		Smuts/Myxomycetes	80	35.3
21139365	Jeff Carr's Office	Aspergillus/Penicillium	133	37.0
		Basidiospores	13	3.7
		Cladosporium	40	11.1
		Epicoccum	13	3.7
		Smuts/Myxomycetes	160	44.4

21139376	Jim Novak's Office	Alternaria	13	2.9
		Aspergillus/Penicillium	187	41.2
		Cercospora	13	2.9
		Cladosporium	107	23.5
		Smuts/Myxomycetes	133	29.4
21139333	Board Room	Aspergillus/Penicillium	200	60.0
		Basidiospores	13	4.0
		Cladosporium	40	12.0
		Smuts/Myxomycetes	80	24.0
21138247	Kathy's Office	Aspergillus/Penicillium	173	34.2
		Basidiospores	27	5.3
		Cladosporium	160	31.6
		Smuts/Myxomycetes	147	28.9
21139352	Attic	Alternaria	13	3.8
		Aspergillus/Penicillium	67	19.2
		Basidiospores	13	3.8
		Cercospora	13	3.8
		Cladosporium	120	34.6
		Epicoccum	13	3.8
		Smuts/Myxomycetes	53	15.4
		Torula	53	15.4
21139319	Melissa's Office	Aspergillus/Penicillium	213	47.1
		Cladosporium	93	20.6
		Epicoccum	27	5.9
		Smuts/Myxomycetes	120	26.5
21137430	Outside Air at Main Entranceway	Aspergillus/Penicillium	27	15.4
		Basidiospores	67	38.5
		Cladosporium	27	15.4
		Smuts/Myxomycetes	53	30.8

Aspergillus/Penicillium are molds that are commonly associated with the presence of moisture impacted building materials. *Aspergillus/Penicillium* was detected in all samples collected during this visit, including the outside air. Excepting at the Attic, a disproportionate concentration of Aspergillus/Penicillium (compared with the outside air) was present in each of the sampled areas.

A copy of the laboratory analysis report for these samples is provided in Appendix 2. Photos of the sampled areas are provided in Appendix 4.

CONCLUSIONS AND RECOMMENDATIONS

- *Ambient Temperature, Percent Relative Humidity, CO_2, and CO measuring/recording*

The results obtained during this visit were compared with the ASHRAE guidelines for ambient indoor temperatures during the winter (heating) season which is 68-76 °F (reference: ASHRAE 55-1992, "Thermal Environmental Conditions for Human Occupancy"). According to this standard, when temperatures are maintained within this range, building owners can expect the vast majority of occupants (10% dissatisfaction) to be comfortable when dressed appropriately for the season.

The measured percent relative humidity levels can be compared with the ASHRAE guideline levels of 20%-60%.

The measured CO_2 concentrations can be compared with the ASHRAE guideline level for "comfort" which is generally considered to be 1000 ppm, and the OSHA-PEL for carbon dioxide level which is 5000 ppm.

The regulatory OSHA-PEL for carbon monoxide is 50 ppm and the health-based Threshold Limit Value provided by ACGIH (ACGIH-TLV®) is 35 ppm.

During this visit, the average ambient air temperature was within the ASHRAE criterion range for temperature anticipated to be acceptable for the vast majority of occupants. Ambient temperature was measured below the ASHRAE criteria range, but only during early morning hours, (presumed) times when the building would be unoccupied.

During this visit, the average percent relative humidity was consistently measured to be within the recommended range during the monitoring period. Relative humidity levels below the ASHRAE criteria was measured, but only for a brief period.

During this visit, the average carbon dioxide concentration was maintained within the recommended range. CO_2 greater than 1000 ppm was recorded, but only during the instrument start-up/stabilization period.

During this visit, no carbon monoxide exceeding 0.1 ppm was detected.

Based on these results, no recommendations are considered necessary.

- *Airborne Mold Spore Testing*

There is no uniformity in the suggested guidelines for acceptable levels of molds in indoor ambient air. Thus, health professionals have no way to determine what levels of molds may pose a threat to human health.

According to the American Conference of Governmental Industrial Hygienists (ACGIH), an independent source of molds likely exists indoors when either of the following conditions exists:

- There is a significantly greater concentration of molds present indoors compared with outdoors (barring a heavy snow covering or rainfall), or
- The types of molds present indoors are significantly different than the types of molds present outdoors.

Aspergillus/Penicillium are molds that are commonly associated with the presence of moisture impacted building materials. *Aspergillus/Penicillium* was detected in all samples collected during this visit, including the outside air. Excepting at the Attic, a disproportionate concentration of Aspergillus/Penicillium (compared with the outside air) was present in each of the sampled areas.

Therefore, these results support the ACGIH guidelines indicating that independent source(s) of airborne mold is/are present in sampled areas at District Office.

Based on this visit, the following conclusions are reached:

- Independent source(s) of airborne molds were considered present at the District Office.
- Disproportionate concentrations of *Aspergillus/Penicillium* (molds commonly associated with the presence of moisture impacted building materials) were detected in each sample collected, excepting the Attic sample.

Based on these conclusions, the following recommendations are provided:

- Address all source of uncontrolled moisture impacting the building.
- Ensure that existing building materials are (and remain) satisfactorily dry.
- Remediate the District Office in conformance with IDPH/AIHA guidelines. Remediation should include the use of HEPA filtered vacuuming and damp cleaning methods to remove all dusts to the extent feasible.
- Provide for independent visual inspection and follow-up testing to determine the effectiveness of remediation activities.
- Inform and educate building users to report any instance of uncontrolled water to building authorities as soon as possible. Building authorities should address any report of uncontrolled water as an urgent matter requiring prompt action to control the water and dry/replace any impacted building materials and/or furnishings as needed.

Respectfully submitted,

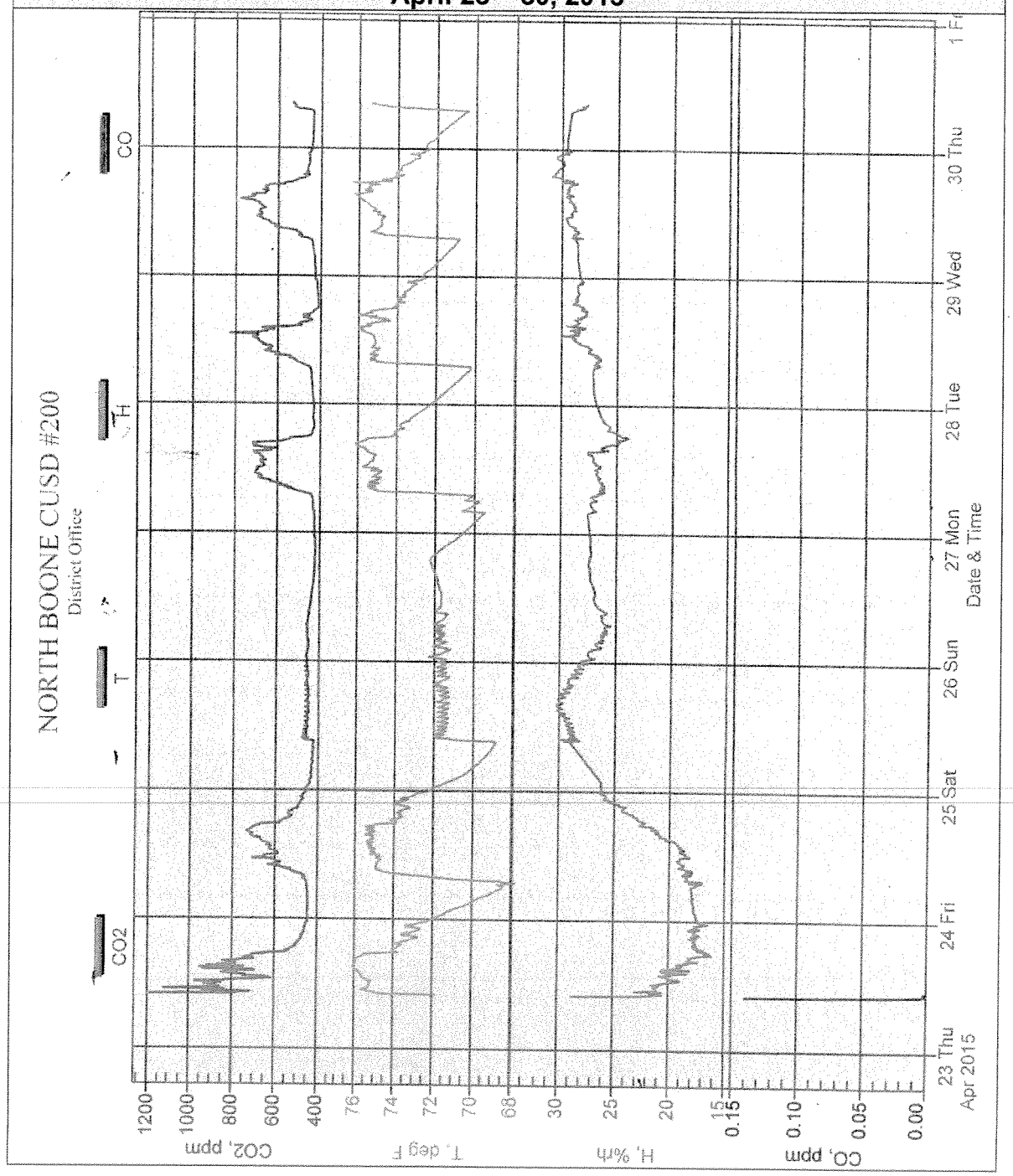
David W. Sloman, CIH
(630) 553-3989
Midwest Environmental Consulting Services, Inc.
4 Bonnie Lane
Yorkville, IL 60560

Appendices (4)

1. Q-Trak Graph & Statistics
2. Laboratory Analysis Reports
3. Drawing with Sample Locations
4. Photos

Performed for:
NORTH BOONE CUSD #200
17641 Poplar Grove Road, Suite A
Poplar Grove, IL 61065
MEC Project #:15-04-222-I.H.

APPENDIX 1
Q-Trak Graph/Statistics
District Office
Poplar Grove, Illinois
April 23 – 30, 2015



Performed for:
NORTH BOONE CUSD #200
17641 Poplar Grove Road, Suite A
Poplar Grove, IL 61065
MEC Project #:15-04-222-I.H.

Graph Statistics

Statistics				
	CO2	T	H	CO
Avg	506 ppm	72.8 deg F	26.0 %rh	0.0 ppm
Max	1187 ppm	76.3 deg F	30.9 %rh	0.1 ppm
Max Date	04/23/2015	04/29/2015	04/29/2015	04/23/2015
Max Time	10:00:26	17:35:08	19:05:08	10:00:26
Min	409 ppm	67.9 deg F	16.2 %rh	0.0 ppm
Min Date	04/28/2015	04/24/2015	04/23/2015	04/23/2015
Min Time	18:25:11	06:45:24	17:45:25	10:30:26
TWA (8 hr)	796			0.0
TWA Start Date	04/23/2015			04/23/2015
TWA Start Time	09:55:26			09:55:26
TWA End Time	08:30:07			08:30:07

Performed for:
NORTH BOONE CUSD #200
17641 Poplar Grove Road, Suite A
Poplar Grove, IL 61065
MEC Project #:15-04-222-I.H.

APPENDIX 2
Laboratory Analysis Results
District Office
Poplar Grove, Illinois
April 23, 2015

STAT Analysis Corporation:
2242 West Harrison St., Suite 200, Chicago, Illinois 60612-3766
Tel: 312.733.0551; Fax: 312.733.2386; e-mail address: STATinfo@STATAnalysis.com

Analytical Report for Microbiological Analysis - Fungal Spores in Air

Client: Midwest Environmental Consulting Services
Project ID: 15-04-222, Poplar Grove
STAT Project No.: 15040819

Date/Time Received: 4/24/15 10:05AM
Date Analyzed: 4/29/2015
Analyzed By: VS
QC By: AM

Client Sample No.:	21139359				21137476				21137560				21139365			
Sample Description:																
Date Sampled:	4/23/2015				4/23/2015				4/23/2015				4/23/2015			
STAT Sample No.:	15040819-001				15040819-002				15040819-003				15040819-004			
Volume (m^3):	0.075				0.075				0.075				0.075			
	Total Count	Count/ m^3	DL	%	Total Count	Count/ m^3	DL	%	Total Count	Count/ m^3	DL	%	Total Count	Count/ m^3	DL	%
Total Fungal Spores:	43	573	13	100	23	307	13	100	17	227	13	100	27	360	13	100
Alternaria																
Ascospores																
Aspergillus/Penicillium	24	320		55.8	9	120		39.1	8	107		47.1	10	133		37.0
Basidiospores	2	27		4.7	2	27		8.7	2	27		11.8	1	13		3.7
Botrytis																
Cercospora																
Chaetomium																
Cladosporium	5	67		11.6	5	67		21.7	1	13		5.9	3	40		11.1
Curvularia																
Drechslera/Bipolaris																
Epicoccum					1	13		4.3					1	13		3.7
Fusarium																
Nigrospora																
Oidium/Erysiphe																
Periconia																
Phoma																
Pithomyces																
Pleospora																
Polythrincium																
Rhizopus/Mucor																
Rusts					1	13		4.3								
Smuts/Myxomycetes	12	160		27.9	5	67		21.7	6	80		35.3	12	160		44.4
Stachybotrys																
Stemphylium																
Torula																
Ulocladium																
Unidentified Fungi																
Other																
Mycelial Fragments	1				1				1				2			
Debris Level	Moderate				Moderate				Moderate				Moderate			
Organic Material	Present				Present				Present				Present			

DL - Detection Limit = Spores/m^3

SOP 6110

Performed for:
NORTH BOONE CUSD #200
17641 Poplar Grove Road, Suite A
Poplar Grove, IL 61065
MEC Project #:15-04-222-I.H.

STAT Analysis Corporation:
2242 West Harrison St., Suite 200, Chicago, Illinois 60612-3766
Tel: 312.733.0551; Fax: 312.733.2386; e-mail address: STATinfo@STATAnalysis.com

Analytical Report for Microbiological Analysis - Fungal Spores in Air

Client:	Midwest Environmental Consulting Services	Date/Time Received:	4/24/15 10:05AM
Project ID:	15-04-222, Poblar Grove	Date Analyzed:	4/29/2015
STAT Project No.:	15040819	Analyzed By:	VS
		QC By:	AM

Client Sample No.:	21139376				21139333				21138247				21139352			
Sample Description:																
Date Sampled:	4/23/2015				4/23/2015				4/23/2015				4/23/2015			
STAT Sample No.:	15040819-005				15040819-006				15040819-007				15040819-008			
Volume (m^3):	0.075				0.075				0.075				0.075			
	Total Count	Count/ m^3	DL.	%	Total Count	Count/ m^3	DL.	%	Total Count	Count/ m^3	DL.	%	Total Count	Count/ m^3	DL.	%
Total Fungal Spores:	34	453	13	100	25	333	13	100	38	507	13	100	26	347	13	100
Alternaria	1	13		2.9									1	13		3.8
Ascospores																
Aspergillus/Penicillium	14	187		41.2	15	200		60.0	13	173		34.2	5	67		19.2
Basidiospores					1	13		4.0	2	27		5.3	1	13		3.8
Botrytis																
Cercospora	1	13		2.9									1	13		3.8
Chaetomium																
Cladosporium	8	107		23.5	3	40		12.0	12	160		31.6	9	120		34.6
Curvularia																
Drechslera/Bipolaris																
Epicoccum													1	13		3.8
Fusarium																
Nigrospora																
Oidium/Erysiphe																
Periconia																
Phoma																
Pithomyces																
Pleospora																
Polythrincium																
Rhizopus/Mucor																
Rusts																
Smuts/Myxomycetes	10	133		29.4	6	80		24.0	11	147		28.9	4	53		15.4
Stachybotrys																
Stemphylium																
Torula													4	53		15.4
Ulocladium																
Unidentified Fungi																
Other																
Mycelial Fragments	1															
Debris Level	Moderate				Moderate				Moderate				Moderate			
Organic Material	Present				Present				Present				Present			

DL - Detection Limit = Spores/m^3

SOP 6110

Performed for:
NORTH BOONE CUSD #200
17641 Poplar Grove Road, Suite A
Poplar Grove, IL 61065
MEC Project #:15-04-222-I.H.

STAT Analysis Corporation:
2242 West Harrison St., Suite 200, Chicago, Illinois 60612-3766
Tel: 312.733.0551; Fax: 312.733.2386; e-mail address: STATinfo@STATAnalysis.com

Analytical Report for Microbiological Analysis - Fungal Spores in Air

Client:	Midwest Environmental Consulting Services	Date/Time Received:	4/24/15 10:05AM
Project ID:	15-04-222, Poblar Grove	Date Analyzed:	4/29/2015
STAT Project No.:	15040819	Analyzed By:	VS
		QC By:	AM

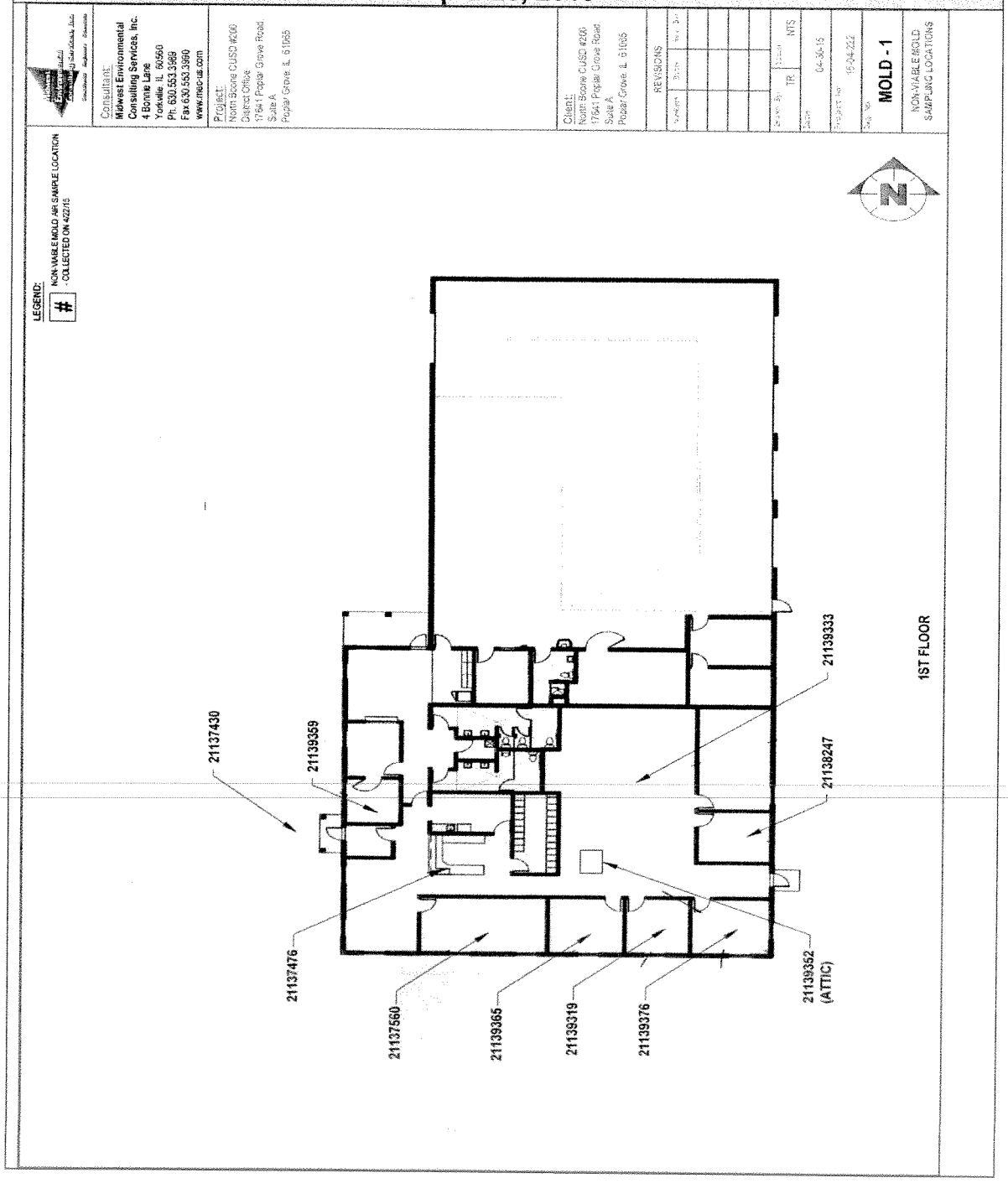
Client Sample No.:	21139319				21137430											
Sample Description:																
Date Sampled:	4/23/2015				4/23/2015											
STAT Sample No.:	15040819-009				15040819-010											
Volume (m^3):	0.075				0.075											
	Total Count	Count/ m^3	DL	%	Total Count	Count/ m^3	DL	%	Total Count	Count/ m^3	DL	%	Total Count	Count/ m^3	DL	%
Total Fungal Spores:	34	453	13	100	13	173	13	100								
Alternaria																
Ascospores																
Aspergillus/Penicillium	16	213		47.1	2	27		15.4								
Basidiospores					5	67		38.5								
Botrytis																
Cercospora																
Chaetomium																
Cladosporium	7	93		20.6	2	27		15.4								
Curvularia																
Drechslera/Bipolaris																
Epicoccum	2	27		5.9												
Fusarium																
Nigrospora																
Oidium/Erysiphe																
Periconia																
Phoma																
Pithomyces																
Pleospora																
Polythrincium																
Rhizopus/Mucor																
Rusts																
Smuts/Myxomycetes	9	120		26.5	4	53		30.8								
Stachybotrys																
Stemphylium																
Torula																
Ulocladium																
Unidentified Fungi																
Other																
Mycelial Fragments	3				1											
Debris Level	Moderate				Moderate											
Organic Material	Present				Present											

DL - Detection Limit = Spores/m^3

SOP 6110

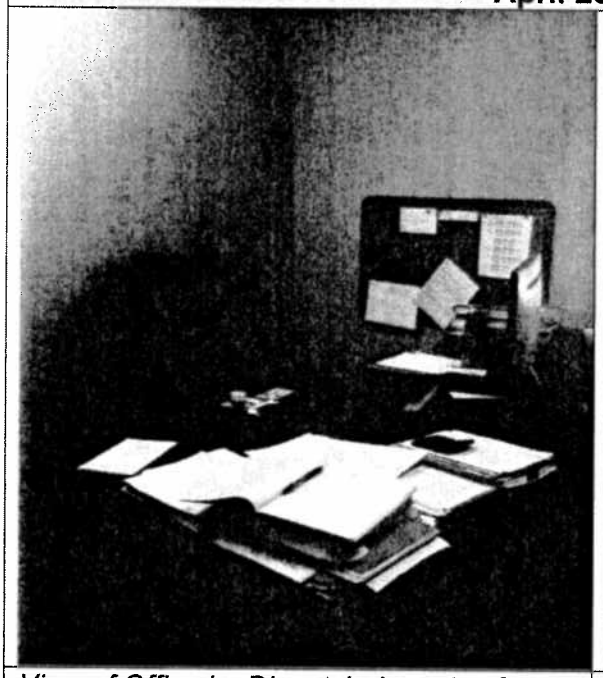
Performed for:
NORTH BOONE CUSD #200
17641 Poplar Grove Road, Suite A
Poplar Grove, IL 61065
MEC Project #:15-04-222-I.H.

APPENDIX 3
Drawing with Sample Locations
District Office
Poplar Grove, Illinois
April 23, 2015

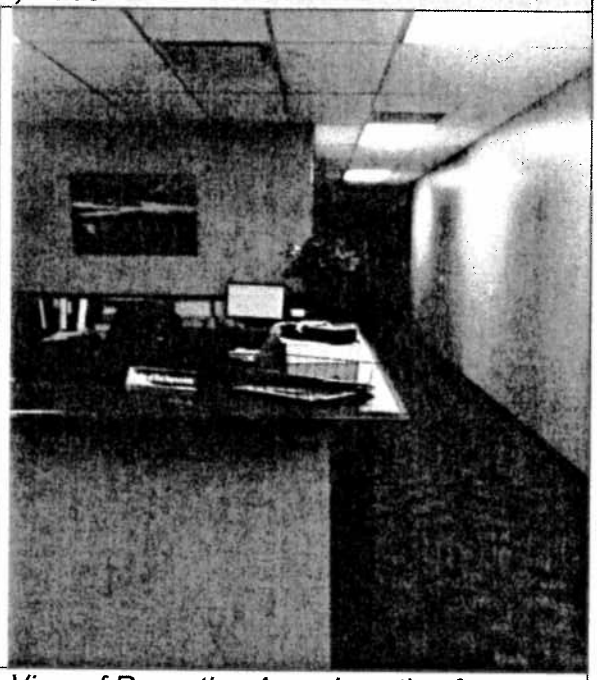


Performed for:
NORTH BOONE CUSD #200
17641 Poplar Grove Road, Suite A
Poplar Grove, IL 61065
MEC Project #:15-04-222-I.H.

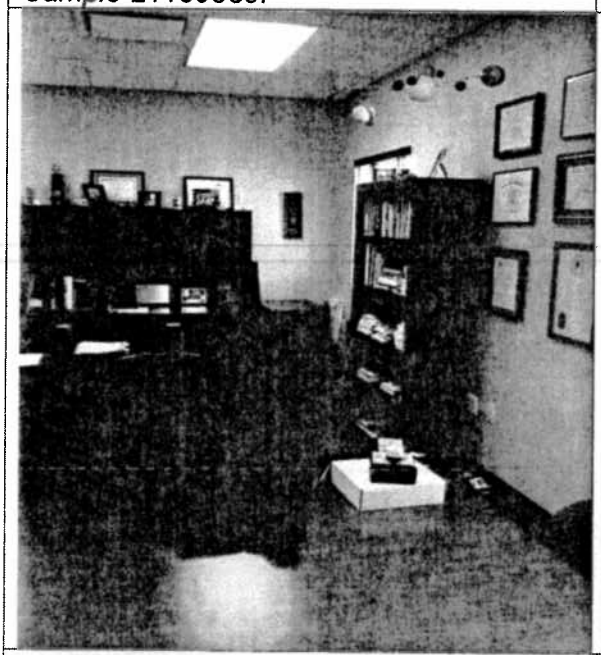
APPENDIX 4
Photos
District Office
Poplar Grove, Illinois
April 23, 2015



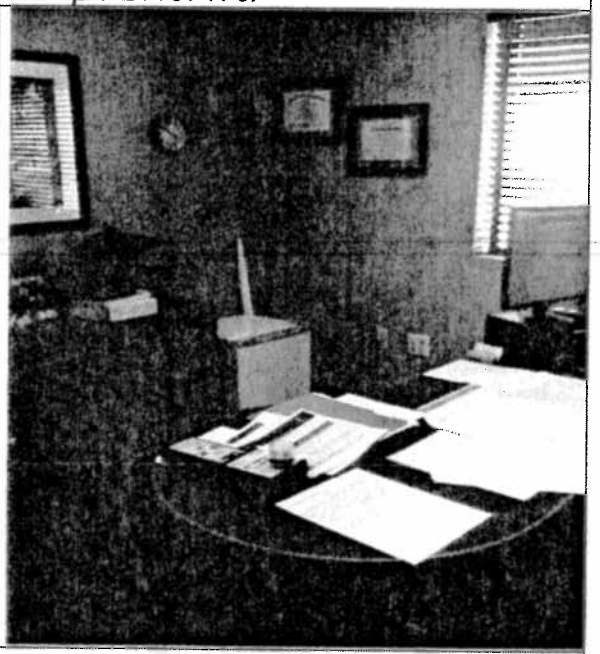
View of Office by Dispatch. Location for Sample 21139359.



View of Reception Area. Location for Sample 21137476.

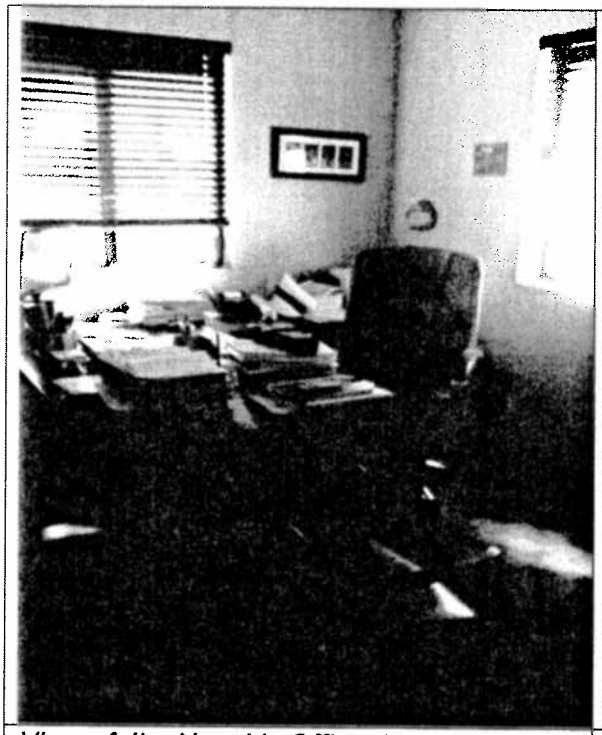


View of Superintendent's Office. Location for Sample 21137560.

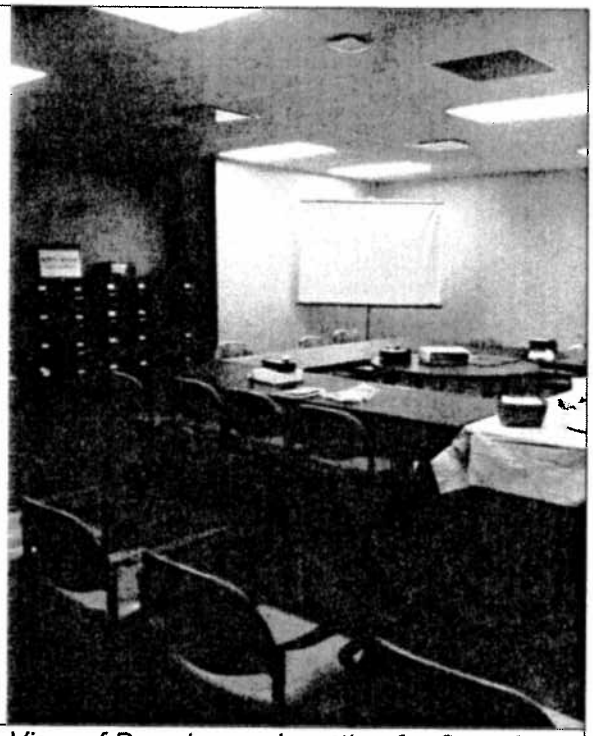


View of Jeff Carr's Office, Location for Sample 21139365.

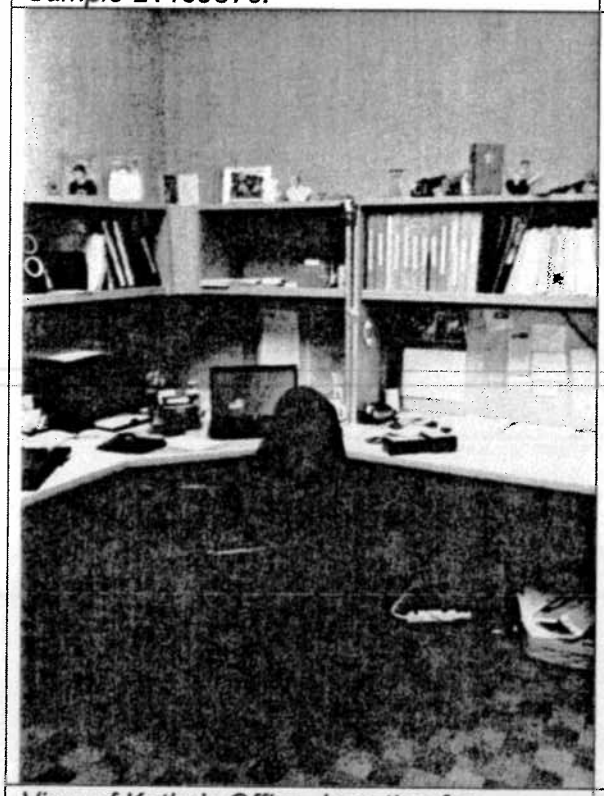
Performed for:
NORTH BOONE CUSD #200
17641 Poplar Grove Road, Suite A
Poplar Grove, IL 61065
MEC Project #:15-04-222-I.H.



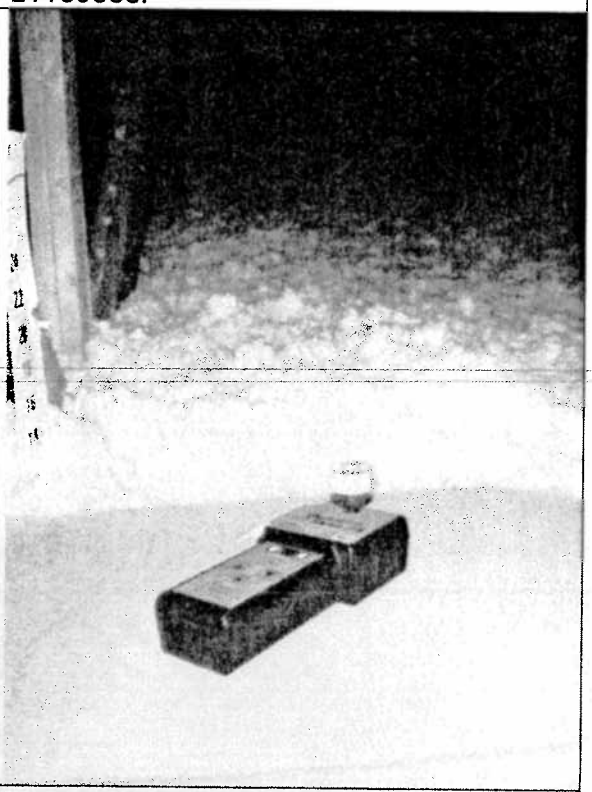
View of Jim Novak's Office. Location for Sample 21139376.



View of Boardroom. Location for Sample 21139333.

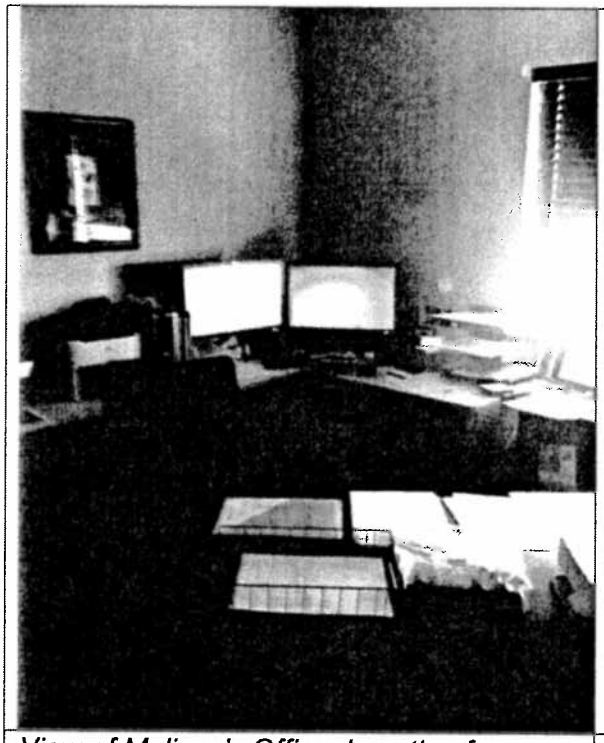


View of Kathy's Office. Location for Sample21138247.



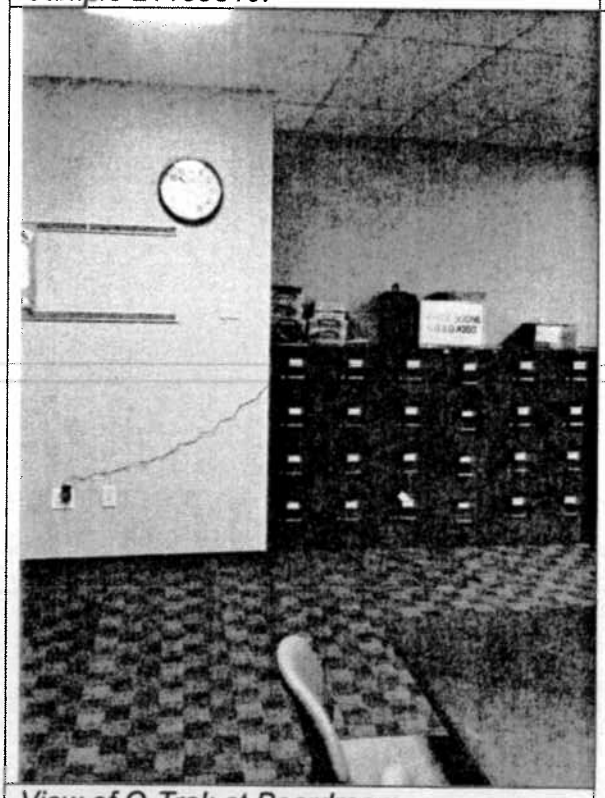
View of Attic. Location for Sample 21139352.

Performed for:
NORTH BOONE CUSD #200
17641 Poplar Grove Road, Suite A
Poplar Grove, IL 61065
MEC Project #:15-04-222-I.H.



View of Melissa's Office. Location for Sample 21139319.

View outside Subject Building. Location for Sample 21137430.



View of Q-Trak at Boardroom.

Performed for:
NORTH BOONE CUSD #200
17641 Poplar Grove Road, Suite A
Poplar Grove, IL 61065
MEC Project #:15-04-222-I.H.