

A Accredited Inspection Service, Inc.
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888-381-6651

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Client: Jane Smith
Property Address: 123 Voc Lane.
City State Zip: Anytown USA
Date: 12-5-06-a

EXECUTIVE SUMMARY

Indoor air quality testing

Two to-15 samples were taking, one from the front foyer area where chemical odors were detected, and one from the dining room area where chemical odors were not detected. Samples indicated:

Ethanol, levels of this chemical were high at 1500 and 1800 ppb or 1.5 ppm and 1.8 ppm but this is not an unusual chemical, it is basically corn alcohol used as a solvent in air fresheners and perfumers, it is also however used in gas, in this report when the term gas is used it refers to automobile gasoline or other similar petroleum products.

Isopropyl alcohol was also detected as well this is basically rubbing alcohol, in may be from the air fresheners as well.

Acetone is from cleaners or inks or from fingernail polish remove.

Difluorochloromethane also known as air conditioner freon was detected. Have your AC units checked for leaks. The leak may or may not be minor.

Methyl chloride was detected this is a strong cleaning chemical or strong paint stripper.

Automobile Fuel / Gas in the air

If the above was all that was found it would not be a major concern, however a major concern was detected, the house has a high number of chemicals that do not belong in homes, these are strong chemicals and are from gasoline, some of the volatile organic compounds commonly found at gas spill sites that were found in your homes air were as follows:

Methyl-tert-butyl ether(MTBE)
n-Hexane
2,2,4- Trimethylpentane
n-Heptane
Benzene
Trichlorethene
4-Methyl-2-pentanone(MIBK)
Toluene
Xylene para meta and ortho
Ethylbenzene
4-Ethyltoluene
1,3,5-Trimethylbenzene

It appears likely that someone has dumped gasoline in the crawl space under the house in the past.

Individual levels of the above individual chemicals may or may not be a major concern in regards to exposure.

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Many or all of the chemicals were well below known set government exposure levels, but when you add all the different levels of all the different chemicals together you have an elevated level of total VOC's. Total levels might be able to cause at a minimum irritation in some persons, in addition these chemicals are mixing together and may complement each other in a synegestic manner thus making the complex mixture of chemicals more of a concern in regards to exposure than if each chemical was breathes separately.

No book, person, or study can say exactly what are safe and unsafe levels of any complex mixture of chemicals and what the health effects will be. Such mixtures are obviously not desirable. Some of these chemicals can cause respiratory irritation and water eyes etc, some of these chemicals such as benzene may be cancer causing agents at high enough levels. This condition must not be left un addressed.

A soil sample was taken and in it DDD was found, DDD is a pesticide and may have been put under the house, or it may have started out as DDT pesticide under the house that over time broke down and turned into DDD.

DDD and DDT have been banned for use in the united states from around 1972. Chlordane was also found under the house in the soil sample, it was likely applied to kill termites, this chemical was banned as a termiticide a few years ago. These chemicals do not likely account for the strong odor in the crawl space not the week odor in the house, these pesticides do not have a strong odor. The odor under the house was a very strong odor and is much more likely attributed to old gas that has broken down and started to produce offensive odors.

Client should contact the department of Agriculture's entomology department in Tallahassee, they may provide additional information or sampling in regards to pesticides under your house.

This inspector does not know if the previous owners knew about this condition but it was observed that the crawl space access panel was sealed extremely tight and it was removed with great difficulty by this inspector.

Please note that gas related chemicals were not found in the soil sample but this may or may not be because the lab let the soil sample set past the time it was suppose to sit before they analyzed it. Perhaps the 6 inch patch of area where the soil was sampled was not the area where gas was dumped. Additional conformation samples of the air can be done under the house to verify gas related chemicals in the house are from the crawl space. As stated above the chemical odor in the crawl space was extremely strong and in addition it was similar to the odor found in the front foyer. When gas breaks down over time it makes unusual strong chemical odors. Regardless of the exact nature of the chemicals and odor under the house it should be remediated.

What can be done

In order to control this problem have the crawl space encapsulating with thick plastic sheets and isonene foam insulation floor walls and ceiling / subfloor.

Have the crawl space air vented to the exterior this will create negative pressure in the crawl space thus making it very difficult for air to escape upward through the floor. This will also remove some of the chemicals from the crawl space.

A dehumidifier will have to be used in the crawl space and drained outside, this will have to be done constantly or humidity and mold problems will form in the sealed crawl space.

Seal the floor under and the walls around the air handler in the closet near the kitchen, this will keep the AC unit from pulling in crawl space air.

Finally it was observed that the front foyer area was the only area where the odor could be detected in the house thus it is possible that

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much of the odor is coming up from under the crawl space through the laminate floor. Remove the laminate floor and replace it with tile. Or cover the laminate wood with a sealant. The other floors in the house were tile and the odor was not detected in these areas.

We do not provide any of these services. On the internet look up keywords such as humidity control in crawl spaces, and mold remediation in crawl spaces, crawl space dehumidification. These will likely bring up companies that provide services similar to what you need.

The AC systems and humidity control.

The humidity in the house was 67% this is far to high and can result in mold and also condinsation problems if not corrected. Maintain humidity between 50%RH and 60%RH.

The reason for humidity problems was three fold:

1)The holes in the AC closet walls and floors allow the AC to suck hot humid air in from the attic via the hallow walls, and also from the crawl space below the floor. The floor and walls will have to be sealed.

2) Thermostats were set to the on setting. Set the thermostats to the auto setting, not the on setting. The on setting causes the AC units blower fan to pull humidity in and distribute it constantly, even when the evaporator coils are not cooling and drying the air produced by the constantly running AC units. This setting is fine in most states but in hot humid regions it can sometimes cause humidity problems.

3) In addition the size of this house was not unusual in regards to it's square footage, it was very roughly around 2000 square foot more or less, however the house has three operating AC units probably totaling very roughly 9 tons of cooling capacity. This house has roughly 2 to 3 times as much cooling capacity as it should for it's size. The problem with this is that the three AC units are to powerful for the house and as a result will cool the house and shut down the compressors long before the houses air is dry thus contributing the the houses humidity problem.

Because of the above humidity problems to much humidity is flowing through the AC ducts and this has contributed to moldy duct odors in the dining room. These ducts will have to be cleaned or more likely will have to be replaced. The odor was not found in the AC units so clean the ducts.

Finally one of the AC systems is leaking at least a small amount of refrigerant, this is known because to-15 air quality testing indicated 120 parts per billion or just over 1/10 of 1 part per million of freon (Difluorochloromethane). It will take a qualified AC service person to determine if the AC unit is leaking enough freon to matter, and to determine which unit is leaking.

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SITE INFORMATION

CLIENT AND SITE INFORMATION:

REPORT NUMBER:

0000364.

INSPECTION DATE:

12-5-06-a.

CLIENT NAME:

Jane Smith.

INSPECTION SITE STREET
ADDRESS:

123 Voc Lane.

CITY/STATE/ZIP:

Anytown USA.

CLIENTS E-MAIL ADDRESS:

123@1234.

CLIENT PHONE NUMBER:

123-4567.

BUILDING TYPE:

house.

General Mold Inspection limitations and disclaimer.

Do not depend on your mold inspector for any medical advice, that is the job of a medical specialist. If any illness is experienced that may be related to mold or other indoor environmental factors, then a family doctor should be consulted regarding health complaints. In addition, the unhealthy person should obtain a referral to the appropriate medical professionals specializing in allergies, environmental medicine, or occupational health, as prescribed by the physician. If building related symptoms, such as allergy or asthma-like symptoms or other similar symptoms are experienced, then a mold investigation is often the logical starting point in an effort to locate, define and control the problem as mold is often the culprit. One must keep in mind that occasionally other bioaerosols can result in symptoms or illness as well. This inspection is not intended to sample or report on what the inspector considers to be typical tiny amounts of expected mold. Unless arrangements are made and agreed to in written form and paid for, this is not an environmental investigation for conditions, such as dust mite, roach, and pet allergens, virus, bacteria, lead-based paint, asbestos, radon, voc's or any other environmental conditions. This is not a wood destroying organism or termite inspection report for dry rot fungus or other fungus that causes wood decay. This is a mold inspection only. The inspector does not offer an opinion as to the advisability of the purchase or sale of property. Unless you pay for and request mold sampling in every room, inner wall stud bay, AC duct, carpet, and all other surface in all areas, then items tested and sampled during this standard mold inspection will be randomly tested and sampled. Environmental testing equipment when used are used in representative or random areas and each and every area of the property is not checked with such

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devices due to time constraints. Inspector is not responsible or liable for the non-discovery of any water damage, water problems, mold contamination, mold problems or other conditions of the subject property, or any other problems which may have developed or become more evident after the inspection and testing time and date. Inspector is not responsible for or liable for the non-discovery of any, water problems, mold contamination, or any other problems that were not discovered due to inadequate sampling in specific areas where sampling was not requested and paid for or where no readily visible clues existed that would have warranted sampling in those areas. Your inspector is unlikely to sample for, or locate mold which may be hidden inside walls, behind wall paper, appliances, furniture or other inaccessible areas.

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HISTORY AND INTERVIEWS

PROPERTY HISTORY The following is the information given to the inspector regarding the subject property. Such interview information is used to guide the inspectors investigation.

INTERVIEWS

Client reported that she remodeled the house 6 months ago and has been smelling odors the entire time, client is not sure if the odors started right after renovations or before. The odors appeared to be most noticeable in the front 10 foot X 10 foot front foyer area and the odors rapidly drop off past the front foyer area.

GOALS AND

OBJECTIVES:

Client requested an indoor air quality investigation to determine the source of odors in and near the front foyer area. This was not a mold inspection.

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INTERIOR INSPECTION

Interior inspection limitations and disclaimer

Unless otherwise requested and agreed to in written form, no destructive or disruptive testing or assessment will be performed, thus moving of furniture and other personal belongings, opening of walls, lifting of carpets, removal of ceiling panels, insulation, and vapor barriers will not be conducted. The inspector will not check any area that poses a safety threat to the inspector such as walking on roofs. A roof inspector should be consulted in regards to any roof concerns. Attics and crawl spaces with low clearance are not entered. The client understands and agrees that inspection and testing can report only on problems that were present at the time of testing and inspection. The inspector cannot report on areas or locations in the building that have not been specifically inspected and tested. Hidden mold that displays no clear warning signs of it's presence will most likely not be detected. Appliances, furniture, office equipment, and other personal items are not be moved during this inspection.

MOLD INSPECTION

OBSERVATIONS

DIGITAL PHOTOGRAPHS

PHOTO 1

The house inspected is an older Coconut Grove house. Client reported that she remodeled the house 6 months ago and has been smelling odors the entire time, client is not sure if the odors started right after renovations or before. Client reported that the odors appeared to be most noticeable in the front 10 foot X 10 foot foyer area and the odors rapidly drop off past the front foyer area. Client has installed new AC units and had the chimney cleaned and has not been able to rid the house of the odor. Furniture in the area were not particle board or other materials that appeared to be likely to release formaldehyde or other VOC's.



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DIGITAL PHOTOGRAPHS

PHOTO 2

Upon entering the house the inspector immediately noticed the odors, the odors appeared to be a chemical odor like a possible varnish or solvent odor. The odors in this area did not appear to be a mold odor. The inspectors initial hypothesis is that the odor may be from the shiny lacquer covered hard wood like floor. However the odor may be from completely unrelated odors.

Floor was installed 6 months age using Permagrane timeless 3 Acrylic plank floor, this is a veneer floor probably made of wood like acrylic veneer over wood boards, this is all installed over the original plywood sub floor with up68 permigrane adhesive.



DIGITAL PHOTOGRAPHS

PHOTO 3

Air samples were tested for formaldehyde and indicated no formaldehyde.

It appears from these tests that the odor may not likely be from formaldehyde off gassing products from the floor, painted walls, or furniture.

To the right is a photo of the glass gas detection tubes used, note that many of these tests were conducted.

Gastec gas detection tube system was used to take a air sample from 1 inch above this floor
Measuring scale .05-1.0 ppm
Results below detectable levels at 5 strokes.

Gastec gas detection tube system was used to take a air sample from the center of this room 5 foot above the floor (breathing range)
Measuring scale .05-1.0 ppm
Results below detectable levels at 5 strokes.

Gastec gas detection tube system was used to take a



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air sample from one inch off the painted walls of this room
Measuring scale .05-1.0 ppm
Results below detectable levels at 5 strokes.

Gastec gas detection tube system was used to take a air sample from one inch above the floor
Measuring scale <.05-1.0 ppm
Results below detectable levels at 10 strokes.

Gastec gas detection tube system was used to take a air sample from the fire place
Measuring scale <.05-1.0 ppm
Results below detectable levels at 10 strokes.

It appears from these tests that the odor may not likely be from formaldehyde off gassing products from the floor, painted walls, or furniture.

DIGITAL PHOTOGRAPHS

PHOTO 4

Paint may be 6 months old and the odor did not appear to be a paint odor.



DIGITAL PHOTOGRAPHS

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PHOTO 5

AC return is in the area and is near the crawl space below, it may be possible that the air handler is pulling odors from the crawl space into the house.

Inspector observed two air fresheners under the air handler and these will add chemicals and odors to the air but the odor these air fresheners were producing were not the same odors detected in the foyer, also client installed the air fresheners after the odor in order to cover the odor up.

Inspector turned up carper under the air handler and smelled for odors, roach odors were detected to be coming up from the crawl space below this area and roach droppings were observed on the old original wood floor under the carper, roach droppings and odors are completely expected in such an area in an older home.

Client is highly recommended to have the openings in the bottom and top of the closet wall in this area sealed, and also client should have the floor in this area sealed as well because this air handler will pull odors and allergens from inside the walls and floor of this closet.



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PHOTO 6

Client felt that the odors may be entering the house from the chimney however the bottom of the chimney was observed to be sealed from access to the crawl space air.
The interior of the air handler was inspected and found to be very clean and free of any odors.



DIGITAL PHOTOGRAPHS

PHOTO 7

Attic was inspected from the access and appeared to be free of the suspect odor.

Crawl space under the house looked typical but inspector detected a strong chemical odors under the crawl space, the odor is a very strong odor chemical / volatile organic compound odor that is hard to describe. It is similar to the one in the front but is much stronger and appears to be the source of the front foyers areas odor. It may be pesticide odors or other chemicals. A soil sample was taken from the crawl space.

Two to-15 air samples were taken from the house, one in the front foyer area and another from the dining room area.



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DIGITAL PHOTOGRAPHS

PHOTO 8

Additional info

Indoor humidity 67%RH at 73% RH this is far to high and it should be brought down to a levels between 30 and 60%RH this will both help the glues or other chemical containing compounds to cure, and will also help to control the mold odors detected in the ducts. In addition seal the openings in the air handler closet as these openings help the air handler pull humidity from the floor and walls and ceiling, also seal the wood floor under the carpet in this room.

Strong odors was detected in the dining room, this was a cladosporium mold odor from the duct work in the area and is the result of to much humidity traveling through the ducts.

This odor always comes from moldy AC ducts in the inspector opinion and it may be required to replace these ducts.

See summary page for the inspectors conclusions regarding analysis results and conclusions. Also see enclosed sample results.

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INFORMATION ON MOLD

HELPFUL MOLD INFORMATION

FUNGAL DEFINITIONS AND HEATH ISSUES:

FUNGI DEFINED

Fungi share some basic similarities with plants and bacteria but are neither. All 1 million to 1.5 million species of true fungi are in their own kingdom, the Fungi Kingdom. Many persons inaccurately use the term mildew to describe fungal growths that they feel are not harmful to human health. The powdery green or white growth in humid closets is sometimes considered by homeowners as "just mildew". Ironically this growth is almost always pen / asp mold. Many species of pen / asp produce offensive smelling volatile organic compounds, and may be toxigenic or allergenic when present at the correct levels. According to more reliable definitions, mildew is a powdery or downey parasitic fungal growth that attacks and grows on living plants, while molds are often fuzzy and grow on all sorts of moist surfaces. Molds, mildews, and other fungi usually reproduce by forming and releasing spores into the air. Typical indoor spores are around 3 to 15 microns across. For reference the period at the end of this sentence is 500 microns.

TOXIGENIC MOLDS

Mycotoxins are chemicals that are sometimes produced by various species of molds. These toxins are real and are powerful weapons used by molds in a sort of microbial warfare to help them compete against bacteria and other molds. Mold spores in residential settings, even if they are potentially toxin producing types and are at high levels, do not necessarily result in toxic effects on humans via inhalation. It takes a lot of inhaled spores to poison a person. Currently, disagreement exists as to if residential mold spore exposures levels are ever high enough to result in toxic effect on humans. However, toxic effects of mold mycotoxins in humans and farm animals leading to serious illness and even death via accidental ingestion of toxic mold, have been well documented in scientific literature.

INFECTIOUS MOLDS

According to a Mayo clinic study, sinusitis caused by growth of fungus fibers or balls of fungus fibers in the sinus cavities is not unusual. This is typically caused by common *Aspergillus*, *Fusarium*, and *Curvularia* species. Aspergillosis caused by the growth of *aspergillus* species in the lungs most commonly *A.fumigatus*, *A. flavus*, *A. Niger* and *A. territus* species typically occurs in persons with compromised immune systems or a history of lung disease that resulted in past lung damage. Common *Candida albicans* that causes yeast infections is a major cause of serious nosocomial (hospital acquired) fungal infections. *Histoplasma capsulatum* and *Cryptococcus neoformans* are very dangerous yeast like molds that should be

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assumed to be present in any bird droppings but are primarily a concern when spread to humans via inhalation of particles from accumulations of pigeon, starling, and bat droppings. *Coccidioides immitis* mold spores are spread from dusty soil in the southwestern United States, it sometimes causes valley fever but at other times the same fungus can be deadly. Nearly any fungi can cause infections in persons with severely compromised immune systems.

Detection of infectious fungi such as but not limited to the above listed ones and identification of fungi to determine the species is not part of most mold inspections.

ALLERGY ASTHMA AND HYPERSENSITIVITY DISEASES

An allergic reaction occurs when your bodies immune system mistakes harmless proteins in mold spores or other allergins as if these proteins were harmful microbes trying to infect your body. Your bodies immune system, feeling threatened releases histamines into the blood stream and these histamines are what actually causes coughing, sneeze, and watering of the eyes. Other persons immune systems will not mistake proteins in mold spores as a microbial threat, and thus not develop allergic reactions. Asthma is a condition where the smooth involuntary muscles lining the airways contract but do not properly relax to allow the lungs to bring in new air. Mold, other bio-allergins, and gases such as nitrogen dioxide and ozone, and even stress are common triggers of asthma. Many people die every year from asthma. Mold-related allergenic and asthmatic conditions in homes are very common and very serious and should be addressed and not ignored. Many serious hypersensitivity diseases in humans, such as baker's lung, wood workers lung and others are the result of exposures to molds by persons working in industries that result in long term exposure to elevated spore levels. Hypersensitivity diseases have long been well documented in science and the medical field. According to Bioaerosols assessment and control hypersensitivity pneumonitis is a hypersensitivity disease that results from the long term repeated exposure to elevated mold spore levels or other antigens, this condition can occur at in industry or agriculture where spore levels are high, it may also occur in moldy offices or homes, it produces pneumonia like symptoms with fever, cough, tightness of chest, lung infiltrates, and difficulty breathing. Once sensitized, individuals may react to extremely low, often unmeasurable, concentrations of antigenic materials. Organic dust toxic syndrome is a flu like illness that results from a short term exposure to very high levels of spores, such as the levels that may be encountered by workers doing large mold remediation jobs without wearing protective respirators. Symptoms show up several hours or a day or so after exposure and symptoms go away after a day or a few days.

Recommended Reference Materials For Additional Information

1) Bioaerosols Assessments and Controls, Janet Macher
American Conference of Governmental Industrial Hygienists, Cincinnati, Ohio (1999)

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2) Damp Indoor Spaces and Health (2004)
Board of Health Promotion and Disease Prevention, Institute of Medicine.

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SPORE LEVEL INFORMATION

SPORE LEVEL INFORMATION

GENERAL INFORMATION ON MOLD SPORE LEVELS

Disclaimers on the following mold spore level information:

The below information was not provided as set health hazard specifications because reactions to mold spores will always differ from person to person. Many substances and factors including but not limited to the following may complicate matters even more: levels of dust mite and roach allergins, volatile organic compounds, gram negative bacteria, individual sensitivity to allergins, emotional stress, and general health. This information should not be relied on as any type of medical advise, see your doctor if you feel sick.

Guidelines on Assessment and Remediation of Fungi in Indoor Environments published in 2000 by the New York City Department of Health.

The most widely accepted guideline across the nation to help determine if indoor mold spore levels are indicative of a possible mold problem is the comparison of indoor and outdoor mold spore levels. Indoor mold spore levels should be similar to or lower than levels found outdoors, and the types of mold spores found indoors should be similar to types found outdoors. Most mold inspectors, certified indoor environmentalist, and industrial hygienists also will generally support the above mentioned comparison method. The below listed organizations and governing bodies also support the above view.
ACGIH 1989, Canada M&H CO. 1991, ACGIH 1993, OSHA 1994, and Brazil 2000.

When reading the below quotes remember that the mathematical symbol > means greater than and < means less than.

Burge 1990

If indoor microbial aerosols qualitatively differ from outdoor, and indoor levels are consistently more than double the outdoor levels and exceed 1000 cfu per cubic meter of air, investigate.

American Conference of Governmental Industrial Hygienists (Air Sampling Instruments for Evaluation of Atmospheric Contaminants 1995)

100 cfu or less per cubic meter of air is low.

100 cfu to 1000 cfu per cubic meter of air is intermediate.

1000 or more cfu per cubic meter of air is high.

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Much of the below information on studies from around the world is from Worldwide Mold Exposure Standards for Mold and Bacteria, Robert C. Brandys, PhD, MPH, PE, CIH, CSP, CMR and Gail M. Brandys, MS, CSP, CMR:

Brazil Government Findings 2002

100-500 normal indoor mold spore levels per cubic meter of air, can be higher in summer.

Norway Government Findings

<750 acceptable.

OSHA 1992 findings

>1,000 Contamination

ACGIH 1993 Findings

>1,000 High

Czech Republic 2000 Findings

> 2,000 Health complaints.

American Academy of Allergy, Asthma and Immunology/National Allergy Bureau findings 2002

1 - 6,499 Low- Only individuals extremely sensitive to these pollens and molds will experience symptoms.

6,500 - 12,999 Moderate - Many individuals sensitive to these pollens and molds will experience symptoms.

13,000-49,999 High Most individuals with any sensitivity to these pollens and molds will experience symptoms.

50,000 Very High - Almost all individuals with any sensitivity at all to these pollens and molds will experience symptoms. Extremely sensitive people could have severe symptoms.

Recommended References Materials For Additional Information

1) Worldwide Mold Exposure Standards for Mold and Bacteria,
Robert C. Brandys, PhD, MPH, PE, CIH, CSP, CMR and Gail M. Brandys, MS, CSP,
CMR

2) American Academy of Allergy, Asthma and Immunology
National Allergy Bureau findings 2002