Our reference: 6999

February 15, 2006
U.S. Department of Justice
Washington, D.C. 20530

Re: Mitchell et al. v. United States

The following report sets forth my opinions and conclusions regarding the environmental testing undertaken at 2063-N Evans Road, Fort Sill, Oklahoma.

I. Qualifications

I am an Industrial Hygienist who has actively practiced industrial hygiene since 1986. Since 1992, I have been a Certified Industrial Hygienist (CIH), in comprehensive practice, as recognized by the American Board of Industrial Hygiene. As part of my industrial hygiene-related activities, I have been frequently asked to address the issue of exposure to chemicals and other agents such as molds and mycotoxins in indoor environments. A copy of my resume is attached to this report.

II. Industrial Hygiene and Mold

Industrial hygiene (IH) is the science of anticipation, recognition, evaluation, and control of physical, chemical, or other hazards. (This discussion will be limited to potential exposure to dust particles (mold) and chemicals (mycotoxins), as they are at issue in this case.) The main task of the industrial hygienist is the evaluation, or assessment, of exposure or potential for

exposure. To carry out this task, the industrial hygienist must understand exposure assessment methods and strategies, and the relevant toxicological issues and likely exposure pathway of the agent(s) they are to assess.

With any dust or chemical, exposure is necessary in order for an individual to receive a dose of the dust or chemical. In order for exposure to occur, there must be a pathway from the source of the agent to the individual and the dust or chemical must be present in a form that can gain entry to the body.

For example, exposure to mold dust from mold growth enclosed inside a wall can occur only when there is a physical pathway from the mold inside the wall to the individual's environment. Mold particles, like other dust particles, are not capable of moving through solid objects. Exposure to mycotoxins also requires a physical pathway from the mold source to the individual's environment because mycotoxins are not volatile chemicals, and as such, stay with the dust or mold particle. (Mycotoxins may not be present since their production depends on environmental conditions such as food source, temperature, and moisture availability.)

Industrial hygiene sampling should be conducted in a way that is relevant to the exposure route for individuals in a particular environment. For molds in the indoor environment, the important exposure route (for mold dust and any mycotoxins contained in the dust) is inhalation. Dermal (skin) contact is possible but is of secondary importance because skin is an effective barrier against mold particles. Ingestion of a sufficient quantity of mold from air to cause adverse effects is highly unlikely in residential environments. Thus, air samples are collected to estimate the potential inhalation exposure to mold particles.

Molds are fungi. They are ubiquitous on all normal surfaces, and mold spores can be carried on air currents and settle on surfaces. Mold growth can occur on surfaces of structural elements of buildings, and visible mold growth on structural members is effectively removed by surface cleaning.

In order for mold growth to occur on building surfaces, sufficient moisture must be present. Potential sources of moisture in buildings include infiltration from poor site drainage, plumbing leaks, window, foundation, roof, and other building envelope leaks, and condensation of humid air on cool surfaces.

1. Casarett and Doull's Toxicology: The Basic Science of Poisons, Fifth Edition. CD Klassen, ed. McGraw-Hill, NY, 1996.

2. Fundamentals of Industrial Hygiene, Third Edition, BA Plog, ed. National Safety Council, Chicago, IL, 1988.

3. Robbins, C.A., *et al*. Health effects of mycotoxins in indoor air: A critical review. Applied Occupational and Environmental Hygiene Vol. 15, p. 773-784, 2000.

III. Basis of Opinions

The basis for my opinions includes my education, training in basic science and industrial hygiene; experience in exposure assessment generally and specifically related to mold and indoor air quality. In addition, I review and analyze published literature concerning exposure assessment and potential health effects of mold and mycotoxins. This training, experience, and study of the published literature include in-depth knowledge of exposure assessment and potential health effects of molds and mycotoxins.

The case-specific records reviewed for the purposes of establishing my opinion are identified below.

IV. Materials Reviewed

- Complaint;

- Answer to Complaint;
- First set of Interrogatories;
- Plaintiffs' Response to Defendant United States' First Set of Interrogatories, Requests for Production of Documents and Requests for Admissions;
- Plaintiffs' Response to Defendant United States' Second Set of Requests for Production;
- Deposition of Brenda Mitchell, dated 10/25/05;
- Deposition of Dominique Mitchell, dated 10/26/05;
- Deposition of Jennifer (Mitchell) Palmer, dated 10/26/05;
- Deposition of Calvin Mitchell, dated 10/27/05;
- Exhibits (1-27) to the Depositions of Brenda Mitchell, Dominique Mitchell, Jennifer Lynne Mitchell Palmer, and Calvin Mitchell;
- HHIM Survey Summary Report (Part I-IV), indoor air survey;
- Department of the Army, Department of Preventive Medicine letter to MSG and Mrs. Mitchell from Ms. C. Perry, dated 03/07/02;
- Department of the Army Memorandum for Housing Management Division re. industrial hygiene survey of 2063-N from Ms. C. Perry, dated 06/18/02;
- Aerotech Laboratories, Inc. reports, dated 02/13/02 and 06/18/02;
- Letter from J. Dutcher, Jr. Esq. to claims Judge Advocate regarding claims of the Mitchell's, dated 01/28/04;
- Department of the Army letter from J. Murphy to J. Dutcher, Jr. Esq. regarding the Mitchell's claims, dated 05/04/04;
- HHIM Single Air Sample Report, dated 02/28/05;
- Mold Lab Int'l Environmental Survey, dated 01/27/06;
- Mold Lab Int'l Mold Screening Report, dated 01/30/06;
- Email correspondence amongst C. Mitchell, C. Perry, B. Spencer, C. Ford, R. Means, and K. Kerchief regarding mold and the Mitchell's request for relocation;
- Medical records for Brenda Mitchell, Dominique Mitchell, Jennifer Mitchell, S.D. Mitchell, and C.A. Mitchell.

V. Record of Events

The Mitchell family moved into a duplex located at 2063-N Evans Road, Fort Sill, Oklahoma in the summer of 1999 (Brenda Mitchell Deposition 139:19-139:21). Mrs. Brenda Mitchell started running a day care out of the home five to six months after moving in and was still operating the day care center at the time of her deposition (Dominique Lydell Mitchell Deposition 11:5-11:22; Plaintiffs' Response to Defendant United States' First Set of Interrogatories, Requests for Production of Documents, and Requests for Admissions, p. 11-12). It is reported in the Plaintiffs' Response to Interrogatories that the "alleged mold incident initially occurred in January 2002" (Plaintiffs' Response to Defendant United States' First Set of Interrogatories, Requests for Production of Documents, and Requests for Admissions, p. 4-5, 11).

Mrs. Brenda Mitchell states in deposition she first became aware of a mold issue in early 2002 when she says the basement filled with water and mold got on some clothes. This incident occurred near the sump pump on the southeast wall (Brenda Mitchell 62:17-63:25 Deposition; Calvin Mitchell Deposition 78:5-88:25). Presumably in response to the Mitchell's complaints, on 02/07/02 spore trap air samples and volatile organic compounds (VOCs) air samples were collected by the Industrial Hygiene section of the Department of Preventive Medicine (Department of Preventive Medicine letter to MSG and Mrs. Mitchell from C. Perry, dated 03/07/02; HHIM Single Air Sample Report, dated 02/28/05). Sump pump repairs were recommended and subsequently conducted in 03/02 (Calvin Mitchell Deposition 93:12-95:23). On 06/11/02, spore trap air samples were again collected. A report was provided by the Department of Preventive Medicine concluding that indoor mold spore levels were less than outdoor levels (Memorandum for Housing Management Division from CL Perry, dated 6/18/02).

Mold was again reportedly found by the Mitchell's in early 2003 (Calvin Mitchell Deposition 78:5-88:25, Brenda Mitchell Deposition 95:24-96:19). In 01/03 workers cleaned the alleged

mold in the basement and ductwork, as well as the ventilation shafts in the ceilings and floors (Plaintiffs' Response to Defendant United States' First Set of Interrogatories, Requests for Production of Documents, and Requests for Admissions, p. 7). Plumbing and sump pump repairs were completed in 01/03 (Calvin Mitchell Deposition 93:12-95:23).

Indoor mold was again reported by the Mitchell's in 2004 (Calvin Mitchell Deposition 78:5-88:25). Hot water leaks were reported in 05/04 and 07/04 (Brenda Mitchell Deposition 93:3-93:23, 94:4-94:25).

On 01/25/06, settling plate mold samples were collected by unspecified persons and Dr. Graham inspected the Mitchell's home (Mold Lab Int'l Environmental Survey Report, dated 01/27/06; Mold Lab Int'l Mold Screening Report, dated 01/30/06).

VI. Discussion and Interpretation of Sampling Data

A. Department of the Army, Department of Preventive Medicine letter to MSG and Mrs. Mitchell from Ms. C. Perry dated 03/07/02 and Aerotech Laboratories, Inc. report dated 02/13/02:

I. Mrs. Mitchell reported in deposition there was water in the area of the sump pump in the basement in approximately 01/02 (Brenda Mitchell Deposition 62:17-63:25, 95:4-95:9; Calvin Mitchell Deposition 78:5-88:25). Sampling for mold and other indoor air quality (IAQ) parameters was conducted on 02/07/02 by the Industrial Hygiene section of the Department of Preventive Medicine. In her letter, Ms. Perry reports that the higher mold spore level in the basement as compared to outdoors is due to the malfunctioning sump pump and moisture in the basement.

II. In response Ms. Perry's findings, it was appropriately recommended that excess moisture in the area be prevented by repairing the sump pump; this repair was arranged, within eight days of the report, by the Housing Management Division

(Defendant's Exhibit 9, LIT 00045). Ms. Perry also correctly notes that the spores identified in the basement were *Aspergillus/Penicillium*; these are commonly found indoors and outdoors and are not associated with elevated health risks due to mycotoxin production. Further, the increased spore levels were found in the basement where conditions were not comparable to, or representative of, those conditions found in occupied living spaces. There is no description of any visible mold growth.

B. On 05/21/02, Mr. Mitchell requests to be moved from the unit and wants to know that the house is "unequivocally" and "100% safe" (PLF 00033). An explanation of what would be considered "100% safe" is not provided.

I. In fact, mold is ubiquitous and the Mitchell family is exposed to mold in virtually every environment they encounter. Further, the consensus of learned bodies is that current evidence does not support that molds in indoor environments cause the development of allergies or result in toxicosis. [American College of Occupational and Environmental Medicine Council on Scientific Affairs. 2003. Evidence-Based Statement. Adverse Human Health Effects Associated with Molds in the Indoor Environment. JOEM 470-478; Institute Of Medicine. Committee on Damp Indoor Spaces and Health. 2004. Damp Indoor Spaces and Health. National Academies Press, Washington, D. C.] For example, the ACOEM position statement is that "Current scientific evidence does not support the proposition that human health has been adversely affected by inhaled mycotoxins in the home, school, or office environment." [American College of Occupational and Environmental Medicine (ACOEM) Council on Scientific Affairs. Evidence-Based Statement. Adverse Human Health Effects Associated with Molds in the Indoor Environment. JOEM 2003: 470-478]

C. In response to the Mitchell's request for relocation, e-mail correspondence in 04/02 and 05/02 documents the attempts at providing duct cleaning at the Mitchell's

residence (ADMIN 0000 762, PLF 00042). Department of the Army personnel recommended that a survey be completed after the ducts have been cleaned to assess mold levels in the unit (PLF 00043-45).

D. Department of the Army Memorandum for Housing Management Division re. industrial hygiene survey of 2063-N from Ms. C. Perry, dated 06/18/02 and Aerotech Laboratories, Inc. report dated 06/18/02:

I. After the completion of sump pump repairs and duct cleaning, non-cultured air samples were collected on 06/11/02. One outdoor sample (location blacked out in chain of custody), three indoor air samples from 2063-N, and two samples from the basement and living area of "519" were collected (precise location of "519" location is not provided). Airborne mold spore levels in the occupied spaces of 2063-N were not elevated above typical background levels. These results indicate no increased exposure risk to occupants indoors compared to outdoors. The sampling results are not indicative of an indoor mold problem and do not support the Mitchell's continued demands for relocation.

II. There is no evidence to support Mr. Mitchell's claim that sampling techniques were flawed (PLF 00038); comparing spore levels in occupied spaces to levels outdoors is an accepted method commonly used by industrial hygiene professionals.

III. Mr. Mitchell states that there are mold types found with the second testing that were not identified with the first testing; this causes him concern and suggests to him that different mold types were acquired during the process of cleaning (PLF 00038-39). In fact, tests performed on different dates cannot be compared directly. Air sampling provides only a snapshot in time of mold types and amounts; the results are continuously affected by such factors as occupant activities and numbers, pets, plants, weather, and ventilation. Regardless, the

predominant spores identified with the second test included *Cladosporium*, *Amerospores* and *Alternaria* which are ubiquitous molds commonly found indoors and outdoors. A few spores of *Pithomyces/Ulocladium* were also found indoors but these were also found outdoors indicating the outdoor air was the source of these spores.

E. Despite the normal air sampling results of 06/11/02, Mr. Mitchell continues to request relocation in 06/25/02 (Defendant's Exhibit 23). There are no records of service order calls or complaints of mold growth prior to 2002. Mrs. Mitchell states that household members have been sick since the time they moved into 2063-N in 1999 (Brenda Mitchell Deposition 98:19-99:4). Despite these concerns, Mrs. Mitchell's home child care services remained active between 1999 and 2005; yet she does not report concern for the potential exposure to mold and the health of child care clients or that these children became ill while in her residence. Further, in response to Mrs. Mitchell's inquiry regarding the safety of her home for family child care, the Department of Preventive Medicine wrote on 03/20/02 that the indoor air quality survey did not reveal any problems (Defendant's Exhibit 20).

F. The first report of mold growth on any surface or any contents in the home is related to the basement leak incident in 01/02 when Mrs. Mitchell reports mold on some clothes apparently in the basement (Brenda Mitchell Deposition 62:17-63:25, 95:4-95:9). There are no subsequent notes of damaged contents until nearly 1.5 years later, on 05/03, when a claim for property damage is filed by Mr. Mitchell (Defendant's Exhibit 26) and a letter dated 05/16/03 from cleaners reports the Mitchell's mold-stained clothes cannot be cleaned (Defendant's Exhibit 27). Photos of items with possible visible mold growth are provided but are undated.

G. Mold Lab Int'l Environmental Survey, dated 01/27/06 and Mold Screening Report for samples received 01/27/06 and tested 01/30/06.

I. Plaintiff's expert report features a section by Dr. Graham. Dr. Graham of Mold Lab Int'l is not a Certified Industrial Hygienist (CIH) per the American Board of Industrial Hygiene (ABIH) (www.abih.org) and it is unclear where Dr. Graham obtained his training and doctorate or in what area of expertise. The American Industrial Hygiene Association (AIHA) accredits labs in the Environmental Microbiology Laboratory Accreditation Program (EMLAP); the Mold Lab Int'l is not accredited in the AIHA EMLAP program. (Accessed at www.aiha.org, 02/10/06)

II. The Mold Lab Int'l screening report provides results for four indoor samples collected on 01/25/06 using a settling plate method, and analyzed on 01/30/06, by the lab. The report notes samples were collected not by Dr. Graham, but by a "customer"; it is unknown whether Dr. Graham or the Mitchell's were the "customer." The Mold Lab Int'l report states that finding one to four colonies per room is normal; five to eight colonies per room is cause for concern with illness likely; and nine colonies per room is hazardous with illness likely. There is absolutely no scientific basis for this interpretation of the results. First, there are no accepted industry guidelines for numbers of airborne mold spores indoors. Secondly, the IH standard method is to collect quantitative volumetric air samples, and to compare indoor spore levels to outdoors. The settling plate method is not a generally accepted method for determining airborne mold spore concentrations. It has long since been replaced by volumetric sampling methods (where spores are collected from a known volume of air sampled) because the settling plate method is not quantitative (no known sample volume) and does not reliably reflect the population of airborne mold spores. [Solomon RW. 1975. Assessing fungus prevalence in domestic interiors. J. Allergy Clin. Immunol. 56 (3): 235-242.] Even if settling plates was used as rough indicator of mold spores present and settling out of the air, an outdoor or other comparison sample is needed to interpret samples from the subject area; and the amount of time that settling plates are exposed (open to the air) must be the same among sample

locations. Control or comparison samples were not collected by the "customer," and settling plate exposure times were not reported.

III. Dr. Graham states that mold can cause a variety of symptoms and that the air that is breathed must be "healthy" to allow occupants to become "healthier." Without providing any support other than the settling plate sample results, which are invalid, Dr. Graham suggests that the air in the Mitchell home is not healthy and that botanical solutions, such as those advertised on his websites (https://www.moldlabintl.com/, http://www.themoldlab.com/mycologist.shtml) are recommended products.

IV. It is unclear what Dr. Graham's credentials are and whether he has received any medical or industrial hygiene training. Dr. Graham also provides no support for his claim that mold can result in a range of health problems. In fact, the consensus of learned bodies is that current evidence does not support that molds in indoor environments cause the development of allergies or result in toxicosis. [American College of Occupational and Environmental Medicine Council on Scientific Affairs. 2003. Evidence-Based Statement. Adverse Human Health Effects Associated with Molds in the Indoor Environment. JOEM 470-478; Institute Of Medicine. Committee on Damp Indoor Spaces and Health. 2004. Damp Indoor Spaces and Health. National Academies Press, Washington, D. C.]

V. In his report dated 01/27/06, Dr. Graham states that there are signs of water intrusion which could contribute to the mold growth and odors he reports in the home. He states there is mold growing in the structure of certain areas of this house and that this is a problem caused by poor ventilation and moisture intrusion. If accurate, mold can be cleaned using standard household cleaners or removal of affected surfaces; elimination of sources of moisture should prevent further growth.

VI. Dr. Graham states mold is carried into cars and offices and that cars need to be treated in the same manner as the home (i.e. use of his botanical cleansers). There is no support that mold spores are carried to and deposited in above-background amounts in cars or offices; and no support that any cleaning is needed. Also, he inappropriately recommends replacing the car if there is a water leak as "spraying will not be adequate."

H. HHIM Single Air Sample Report, dated 02/28/05.

I. On 02/07/02, samples were apparently collected by Department of the Army personnel in the basement of the home. Temperature, carbon dioxide, carbon monoxide and relative humidity were measured with an AQ5000, and VOCs were measured with a direct reading tube. Measurements were all in the normal range.

VII. Opinions

The following opinions are provided with a reasonable degree of scientific certainty.

1. Department of the Army industrial hygiene staff investigated the Mitchell's home on February 7 and June 11 of 2002; based on my professional experience and in light of the limited potential health effects of mold exposure, these responses were conducted in a reasonable and timely manner consistent with the standard of care for this type of investigation.
2. Results of airborne mold spore testing indicate a source of mold in the basement of Unit 2063-N (sampling on 02/07/02).
3. Testing results indicate that mold spores levels in the living spaces are not influenced by mold spores from the basement (sampling on 06/11/02).
4. Airborne mold spores are not elevated above typical background in the occupied (living) spaces of Unit 2063-N (sampling on 06/11/02).
5. Results and opinions provided by Mold Lab Int'l cannot be considered credible due to many factors, including the apparent lack of professional training or credentials, the

use of an inappropriate sampling technique (including omission of comparison samples), and the use of a non-accredited laboratory for sample analysis.

VIII. Trial Testimony

A list of previous trial testimonies is attached.

IX. Compensation

My company charges **$400** per hour for my time in depositions and trial testimony. This report is based on the materials received and analyzed to date.

Should additional information become available, I reserve the right to amend my opinions accordingly.

Sincerely,

Veritox, Inc.

Coreen A. Robbins, PhD, CIH
Senior Industrial Hygienist