

**MICHAEL L. CANNON**

**EDUCATION**

A.B., English, University of North Carolina, Chapel Hill, North Carolina, 1978.

**AFFILIATIONS**

American Board of Industrial Hygiene, Certified Industrial Hygienist-Comprehensive Practice, Certificates: # 3715- 1987 to 2005 and # 9188- 2006 to 2012

**CONTINUING EDUCATION**

**University of North Carolina, Chapel Hill Evening College, 1981 - 1982.**

- Analytical Chemistry
- Organic Chemistry

**Harvard School of Public Health**

- Basic Industrial Hygiene

**University of North Carolina, Chapel Hill-OSHERC**

- Basic Industrial Hygiene
- Personal Sampling
- EPA AHERA Inspector Course
- EPA AHERA Management Planner
- NIOSH 582 Sampling and Evaluating Airborne Asbestos Dust

**North Carolina State University**

- Industrial Ventilation Conference (Advanced, 1987)

**AIHC Professional Development Courses**

- Radio Frequency/Microwave Radiation Protection
- Indoor Air Quality and Radon
- Prevention, Determination and Remediation of Biological Contamination in Indoor Environments
- Introduction to Chemical/Biological/Radiological Warfare and Consequence Management

**Pathcon Laboratories, Norcross, Georgia**

- Microorganisms in Indoor Air

**Georgia Institute of Technology**

- Respiratory Protection for the Asbestos Abatement Industry

**Condor Geotechnical Services**

- 40-Hour HAZWOPER Evaluation Course

**Virginia Tech**

- HIPAA Awareness and Security Training

**ELB and Associates**

- NIOSH Certified Pulmonary Function Technician Training

## **CAREER HISTORY**

**FORCON International** - Senior Industrial Hygiene Consultant - Provides consulting and expert witness services for environmental & toxic tort claims and litigation requiring industrial hygiene expertise.

### **Virginia Tech Environmental Health and Safety-Blacksburg, Virginia**

Manager Industrial Hygiene Services and Medical Surveillance Department

Managed both the industrial hygiene and medical surveillance departments that served the Virginia Tech campus and satellite facilities in the Commonwealth. I was responsible for the supervision of three industrial hygienist and two medical services technicians. Reported to the Assistant Director of Environmental Health and Safety. Duties included review of campus health and safety policies, development of campus programs for industrial hygiene, review of new and renovated building drawings for exhaust ventilation controls and other control measures utilizing best management practices, working with Facilities Management in addressing health and safety issues for university operations and working with human resources in reviewing employee accident reports relative to workers compensation claims.

**4C Occupational Health and Safety Consultants**, Blacksburg, Virginia & Atlanta Georgia - Over 38 years of occupational health and safety experience as a consultant. Assists major corporations with OSHA compliance, industrial hygiene, health and safety training, health and safety program development and workers compensation claims. Provide insurance loss control departments with underwriting risk analysis and industrial hygiene services for their insured's. Consult with law firms as an expert for workers compensation, environmental, property and general liability cases.

**Golder Associates Inc.**, Atlanta, Georgia - Corporate Health and Safety Officer and Director, Industrial Hygiene - Responsible for corporate health and safety for over 700 employees in the US. Developed a safety and health web page via the company Intranet for communicating company policies and procedures. Reviewed and approved site-specific health and safety plans for RCRA and Superfund projects. Responsible for review of worker's compensation cases. Conducted industrial hygiene and occupational health surveys, health and safety audits, health and safety training, regulatory compliance audits, and personal and area monitoring

**Crawford & Company/The FPE Group**, Atlanta, Georgia - Senior Industrial Hygiene Consultant Provided Industrial Hygiene and Safety consulting services to clients ranging from industrial facilities to municipalities. Supervised sales and marketing staff for promotion of OHS.

**Hartford Steam Boiler Inspection & Insurance Co.** - Atlanta, Georgia - Southeast Regional Manager, Occupational Health Services (OHS) - Provided Industrial Hygiene and Safety consulting services to clients ranging from industrial facilities to municipalities. Supervised sales and marketing staff for promotion of OHS.

**Ennis Lumsden, Boylston and Associates, Inc.**, Chapel Hill, North Carolina  
Manager, Industrial Hygiene Services - Managed a staff of industrial hygiene consultants, including certified industrial hygienists, staff industrial hygienists and industrial hygiene technicians.

## **PROJECT RELATED EXPERIENCE - RISK MANAGEMENT**

### **Insurance Underwriting Risk Analysis**

Performed risk analysis of major corporations and contractors relative to insurance coverages that included general liability, professional liability, pollution liability, products liability, completed operations, inland marine property, and workers' compensation. Companies included petroleum refineries, chemical manufacturers, chemical distributors, hazardous waste processors, TSD's, transportation firms, asbestos abatement contractors, and lead-based paint abatement contractors. Surveys included an overview of business operations, administrative controls, company experience and specific controls in place for the coverages being evaluated. The report provided an opinion of risk and recommendations for improvement to the insurance underwriter. Clients included AIG, Reliance National and ECS.

### **Loss Control Surveys**

Conducted both property and casualty loss control surveys for a broad range of insurance companies as well as self-insured corporations. Used survey formats provided by the insured or those developed for the client. Provided various levels of reports ranging from checklist to full reports with recommendations for reducing risks. Clients included AIG, Reliance National, The Hartford, Allstate, State Farm, Travelers, Royal,

### **Technical Loss Analysis**

Evaluated workers' compensation claims relative to occupationally related disease and injury. Provided guidance to claims administrators for determining the validity of the claim. Performed field evaluations where necessary (e.g., air monitoring, surveys, IH audits, etc.) to determine exposure risks. Interfaced with occupational health physicians and law firms in resolving the claims.

### **Workers Compensation Claims Management**

Assisted VT University Human Resources Department by conducting review and investigation of employee accident reports. The review and investigation would include but not limited to discussions with the injured employee and their supervisor/department head, evaluation of the conditions and operations that were related to the accident including any relevant monitoring that would be needed and a determination of whether the reported accident was work related.

**PROJECT RELATED EXPERIENCE - SAFETY**  
**Industrial and Commercial Building Safety Audits**

Conducted over 800 safety audits to evaluate corporate safety and health programs relative to current loss trends and regulatory compliance. Emphasized management and employee responsibility for achieving improvements in loss ratios. Involved with several national self-insured accounts in developing a comprehensive safety/health and loss prevention program. These accounts were managed to achieve low loss rates that in turn had a positive effect on company revenue performance. Designed the program to assign losses to individual departments; this program increased management awareness and improved company loss ratios relative to workers' compensation costs. Companies serviced included chemical manufacturing, paper and pulp, textile, furniture manufacturing, medical facilities, metal fabrication, microelectronics and general/asbestos abatement contractors.

**Industrial Safety and Health Training**

Conducted safety and health training to meet company objectives and regulatory compliance. Training has included 8- and 24-hour HAZWOPER training, lockout/tagout, confined space entry, hazard communication, lab safety, personal protective equipment, accident investigation techniques, job safety analysis and respiratory protection.

**Asbestos Building Materials Evaluations/Project Management**

Acted as owner representative on major abatement projects overseeing contractor activities to assure conformance with project specifications and regulatory compliance. Conducted comprehensive facility evaluations for asbestos containing building materials for First Union National Bank in North and South Carolina, First Union Mortgage Corporation throughout the U.S., Carolina Telephone and Telegraph, Velsicol Chemical Corporation, The Bibb Company and La-Z-Boy Chair Company. The data from these surveys was used to establish an abatement timelines and an operations/maintenance programs. Conducted training of custodial and maintenance personnel in accordance with OSHA and EPA standards.

**PROJECT RELATED EXPERIENCE — INDUSTRIAL HYGIENE**

**Commercial Indoor Air Quality/Sick Building Syndrome Surveys - Fungi, Bacteria, Endotoxin, Volatile Organic Compounds, Formaldehyde and Nicotine**

Provided support to University Facilities Management with regards to fungi (mold) issues related to water damage and elevated relative humidity conditions. Assessed conditions in both campus office and mechanical spaces. Recommendations were made for remedial actions for both removal of mold contaminated materials and correcting the moisture problem

Conducted comprehensive indoor air quality assessments for commercial banking, insurance companies, hospitals, airline training center, telecommunications companies and computer support service centers. Services have included qualitative and quantitative analysis of building

conditions including HVAC system review. Occupant questionnaire and interviews were conducted and evaluated to pinpoint symptoms and potential causes of building-related issues. Air monitoring for VOC's, formaldehyde, carbon monoxide, carbon dioxide, nicotine as a marker for cigarette smoke and bioaerosols was conducted. Information gathered from these evaluations have resulted in remedial actions that have included HVAC system improvement, substitution of janitorial and pest control chemicals, employee work practice improvements, and office ergonomic design modifications.

### **Commercial Building Indoor Air Quality- Odor Evaluations**

Investigated an odor complaint of a campus research building related to the use of ethyl mercaptan the odorant associated with the natural gas smell. Building had history of reported gas odors. Interfaced with facilities management, building management representatives, research principles and students to track odor events. Conducted smoke test on the strobic exhaust system to determine if there was re-entrainment of exhaust gases from lab hoods back into the HVAC system. During a response to an odor event discovered that the vacuum system exhaust to the lab hoods exhausted near the air intake to the HVAC system. Corrective action was taken with the aid of facilities and the odor issue was abated.

Campus research building reported that the kitchen exhaust from a nearby dining hall was entering the building exacerbating asthma symptoms of some occupants. Interfaced with facilities management, building management representatives, research principles and students to track odor events. Conducted particulate and VOC air monitoring in an attempt to characterize the potential exposure to the kitchen exhaust in the research building. A smoke test was performed to determine potential pathways for the kitchen exhaust entering the research building. Incremental actions were then taken in an effort to reduce infiltration of the kitchen exhaust into the research building.

Campus roofing project resulted in the odor from the roof adhesive entering the building. Interfaced with facilities management, building management representatives, professors and students to track odor events. Conducted meetings with building occupants and facilities management to determine potential pathways for the adhesive odor to enter the building. Identified potential odor pathways, e.g. abandoned exhaust stacks on the roof, and these were sealed. Also revamped the notification procedures for roof related projects going forward to better communicate the impact of these projects on the indoor environment.

Conducted area air monitoring in a multi-building facility to screen for odors using Mini-Cans (vacuum containers) and diffusion badges for formaldehyde. Collected representative 8-hour samples in complaint, non-complaint and HVAC intake areas to characterize odors within the building relative to the installation of floor coverings. Analysis performed using a GC-Mass Spectrophotometer was able to achieve detection levels in the parts per billion range for a library of organic compounds. Compared results to current OSHA permissible exposure limits (PELs), American Conference of Governmental Industrial Hygienists (ACGIH) Threshold Limit Values (TLVs®), and the American Industrial Hygiene Association's- Odor Thresholds for Chemicals with Established Occupational Health Standards.

### **Industrial Noise Surveys**

Conducted noise surveys on campus related to the use of the VT-Corp of Cadets Skipper Cannon. Determined the use of hearing protection for the cadets operating the cannon. Conducted numerous noise surveys for a variety of industries that have included paper and pulp, petro-chemical, concrete pipe processing, furniture manufacturing, data processing, textile manufacturing, and transportation services. These surveys have been conducted to determine compliance with OSHA standards for noise and hearing conservation and to provide supporting data for defense in workers' compensation claims. Environmental noise surveys have included construction sites, manufacturing facilities, outdoor entertainment events, and nightclubs. The data gathered for these surveys have been used to determine environmental impact and compliance with federal, state, and local community noise regulations and to provide supporting data in defense of environmental noise complaints.

### **Industrial Power/Steam Boiler - Coal Dust, Crystalline Silica and Inorganic Arsenic Exposure Monitoring**

Conducted environmental air monitoring for coal dust (PM10) and respirable crystalline silica in response to campus coal dust concerns at a nearby dormitory. Air monitoring was performed at various locations on campus including the dormitory in question to evaluate potential impact of the power/steam boiler coal yard operations on air quality. Results of the test were provided to the parties of interest.

Conducted air monitoring for respirable crystalline silica for fly ash exposures from coal fired power boilers associated with paper mills during normal work activities, e.g. periodic inspections, compressed air lancing and outages. Sand blasting operations at various metal fabrication facilities for surface preparation, the removal of old paint finishes and removal of oxidation (rust). Exposure monitoring was conducted both outside and inside the air-supplied shroud to determine the effectiveness of the sand blasting booth and respirator. Brick manufacturing facilities to document the use of sands containing silica for decorative purposes on the production line. Conducted air monitoring at a glass recycling facility that produced reflective powders for highway paint applications to confirm that no respirable crystalline silica was present as a result of crushing automobile windshields.

Conducted inorganic arsenic air monitoring for coal fired power facilities in Georgia during boiler outages. Provided twenty-four hour turnaround on sample analysis in order to support timely evaluation and updating of work practices, personal protective equipment and ventilation controls.

### **Cluster Disease Studies - Public School and Power Lawn Equipment Manufacturing**

Conducted a cluster disease study for potential high rate of cancers among schoolteachers at a public school in East Tennessee. Conducted an inventory of potential carcinogens at the school, reviewed public records for the property to determine previous use, conducted interviews with the administration and faculty, conducted air, surface and water sampling for suspect carcinogens that included but not limited to radon, methylene chloride, formaldehyde and benzene. Interacted with



NIOSH who was studying the prevalence of breast cancers among schoolteachers. Conducted a thorough review of the IARC monographs and cancer rates/mortality statistics for the counties in this region of the state. Determined that there was no significant exposure to carcinogens at the school and that the rate of cancer at the school was consistent with the cancer rates for this region of the state.

A cluster of birth defects were reported at a power lawn equipment company in Georgia. Coordinated with NIOSH on behalf of the company to conduct an investigation to determine if there was a link between the work environment and the birth defects cluster. Reviewed the chemical inventory, the material safety data sheets and conducted air monitoring for solvents that were possibly linked to the reported birth defects. NIOSH determined there was no link between the work environment at the power lawn equipment company and the reported birth defects cluster.

### **Metal Fabrication Operations - Workplace Noise Exposures, Welding Fume Exposures (metals and gases) and Dermatitis from Cutting Fluids and Coolants**

Evaluated air contaminant and noise exposures at large-scale metal fabrication operations. Air contaminant exposures have included metal fume from plasma and laser cutters, welding fume from assembly operations, oil/coolant mists from CNC/machining, solvent exposures from spray painting, total particulates from powder coating and acid/caustic mists from metal treatment operations. These surveys have led to the development of work practice programs, medical surveillance guidelines, hearing conservation programs, effective exhaust ventilation controls and hazard reduction relative to raw material/chemical substitution.

### **Paper and Pulp Industry and Waste Water Treatment Plants - Hydrogen Sulfide/Sulfur Compounds Exposure and Odor Monitoring**

Conducted extensive air monitoring for hydrogen sulfide/sulfur compound related to work place exposures and odor complaints at Paper and Pulp mills using both OSHA and EPA methods. Characterized sulfur compound odor issues over the plant site as it related to complaints. Developed action plans and control strategies to reduce work place and odor exposures to these sulfur compounds.

Conducted evaluation of a wastewater treatment facility in Florida for hydrogen sulfide to determine feasibility of removing walls around the screen room. The wastewater facility was located less than 30 feet from the property boundary to a public school. Recommendations were made regarding emissions control options.

### **Foundry Operations - Lead, Cadmium, Respirable Crystalline Silica, Formaldehyde, Phenol, Heat and Noise Exposures**

Evaluated air, noise and heat stress exposures at an iron ductile pipe foundry, a brass foundry, marine parts foundry and an aluminum reprocessing/recycling facility. Air exposures evaluated included respirable crystalline silica, lead, formaldehyde, phenols and metal fume. Engineering

controls, work practices and personal protective equipment were evaluated. Improvements to these controls were recommended to minimize work place exposures to air contaminants, noise and heat. Medical surveillance guidelines were provided for related metal fume exposures e.g. lead, cadmium.

The marine parts foundry evaluation was performed on behalf of the worker's compensation carrier to determine if the employee had been exposed to lead and cadmium to cause renal injury. Air and surface testing was conducted to determine workplace exposures. Consulted with the carrier regarding biological monitoring for determination of current blood lead levels and long-term ZPP levels. Determined that his smoking may contribute up to 50% of his blood cadmium levels.

**Truck, Bus and Emergency Vehicle Manufacturing - Workplace Noise Exposures, Diesel Particulate Monitoring, Coal Tar Pitch Volatiles, Carbon Monoxide, Paint/Cleaning Solvents and Welding/Torch Cutting Metal Fume**

Evaluated air contaminant and noise exposures a major truck and bus manufacturing facilities in the Southeast US. Air monitoring has included carbon monoxide, elemental carbon and CTPVs during truck start up and dynamometer testing, welding and torch cutting metal fume and gases in frame manufacturing, paint/cleaning solvents during truck and bus body preparation and solvent exposures during the application of undercoating.

**Metal Scrap Yards - Workplace Metal Fume Exposure From Torch Cutting**

Conducted air-monitoring surveys to evaluate workplace lead and metal fume exposures. Established lead compliance programs in accordance with OSHA standards including blood lead monitoring. Provided respiratory protection training and fit testing.

Conducted an in-depth study to determine sources of workplace lead exposure; this study included scrap testing, soil testing, comparative air monitoring and torch tip evaluations. Determined that new torch tips with brass inserts could produce concentrations of lead in excess of the OSHA action level.

**Textile Manufacturing - Cotton Dust**

Conducted in-depth cotton dust monitoring surveys to evaluate employee exposures and exhaust ventilation controls. These services have included exhaust ventilation control isokinetic air monitoring for determining filtration efficiencies and optimum design criteria. Documented the influence of total dissolved solids from overhead spray humidifiers on cotton dust air concentrations in various departments of the mill. OSHA has utilized his expertise as a third-party consultant to resolve exhaust ventilation problems for companies under citation in both Regions IV and VI.

**Textile Finishing**

Performed air monitoring to evaluate workplace exposures in dye and finishing operations. Air



contaminants have included benzidine-based dyes, phenols, formaldehyde, aromatic and chlorinated hydrocarbons, acids and caustic compounds. These evaluations have been a key element in establishing medical surveillance guidelines, personal protective equipment requirements, and hazard communication programs.

**Microelectronics Industry - Tin, Lead, Rosin Core Pyrolysis Products, Volatile Organic Compounds and Inorganic Acid Mists**

Conducted air monitoring to evaluate work place exposures to rosin core pyrolysis products and lead from hand and wave solder operations, solvent exposures from ultrasonic vapor degreasers, formaldehyde exposures from solder and assembly operations, and acid mist exposures from cleaning operations. Developed personal protective equipment and work practice procedures to minimize employee exposures to lead from wave solder dross cleaning.

**Pulmonary Function Testing - Textiles and Poultry Processing**

In addition to air monitoring for dust related workplace exposures, have conducted over 50,000 pulmonary function tests, which have involved the evaluation of several parameters that have included FEV1, FVC,