



ENVIRONMENTAL HEALTH & ENGINEERING



SCIENTISTS AND

ENGINEERS SOLVING

PROBLEMS AND CREATING

OPPORTUNITIES.



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ABOUT EH & E

In 1988, two professionals from the Harvard School of Public Health established Environmental Health & Engineering, Inc. (EH&E) to provide businesses and institutions with a reliable resource for environmental consulting and engineering services. Since then, these founding visionaries, John F. McCarthy, Sc.D., C.I.H., and John D. Spengler, Ph.D., have assembled a team of over 50 hand-selected, highly-trained individuals who share a passion and enthusiasm for the built environment.

EH&E. Knowledgeable, experienced, committed professionals.

Members of our staff:

- are associated with leading universities,
- are active in industry organizations,
- conduct groundbreaking research,
- are acknowledged leaders in their fields,
- have excellent relationships with key governmental agencies

With this unique team, EH&E has earned a reputation for being a focused, service-driven company, constantly exceeding clients' expectations.

Building related engineering and environmental issues are complex and serious with potentially significant ramifications on people, businesses, and institutions. EH&E can provide the complete environmental and engineering solution to effectively address these issues. Whether it is a study of the effects of pollutant exposure to human health, a complex risk assessment, commissioning of



an AIDS research laboratory, or addressing questions about the most recent federal compliance requirements — we don't just tackle technical issues, we provide solutions to major business challenges.

EH&E has a depth of knowledge and credibility unmatched in the industry and our wealth of readily-accessible information has become a powerful resource for our clients. Some of the professional disciplines we offer include:

- Certified Industrial Hygienists
- Certified Hazardous Materials Managers
- Professional Engineers
- Chemists
- Microbiologists
- Fire Protection Engineers
- Professional Geologists
- Certified Safety Professionals
- Toxicologists
- Risk Assessment Specialists
- Biosafety Specialists
- Material Scientists
- Project Engineers

Research shows that creating a healthier work environment is good business practice and should be part of any strategic plan. EH&E's ability to provide a comprehensive range of environmental and engineering solutions and people who can help implement them gives our clients a resource unrivaled in the field.



SELECTED CLIENT LIST

Healthcare Facilities

Beth Israel Deaconess, Boston, MA
Boston University Medical Center, Boston, MA
Brigham and Women's Hospital, Boston, MA
Chambersburg Hospital, Chambersburg, PA
Children's Hospital, Boston, MA
Columbus Regional Hospital, Columbus, IN
Dana-Farber Cancer Institute, Boston, MA
Dartmouth Hitchcock Medical Center,
Nashua, NH
Massachusetts General Hospital, Boston, MA
Massachusetts Hospital Association,
Burlington, MA
Memorial Hospital, South Bend, IN
Memorial Sloan Kettering Cancer Center,
New York, NY
North Shore Medical Center, Salem, MA
Partners Healthcare Systems, Inc., Boston, MA
Salem Hospital, Salem, MA
South Shore Hospital, Weymouth, MA
Volunteer Hospital Association, Braintree, MA
Women and Infants' Hospital, Providence, RI
Yale-New Haven Hospital, New Haven, CT

Biotechnology and Research Facilities

Acusphere, Inc., Watertown, MA
Ariad Pharmaceuticals, Inc., Cambridge, MA
ETEX Corporation, Cambridge, MA
Genetics Institute, Andover, MA
Genome Therapeutics Corporation,
Waltham, MA
Genzyme Corporation, Framingham, MA
ILEX Oncology, Boston, MA
Matritech, Newton, MA
Millennium Pharmaceuticals, Inc.,
Cambridge, MA
Peoples Genetics, Inc., Woburn, MA
Pfizer, Inc., Cambridge, MA
Stryker Biotech, Hopkinton, MA
TransForm Pharmaceuticals, Inc.,
Waltham, MA
TransKaryotic Therapies, Inc., Cambridge, MA
UCB Research, Inc., Cambridge, MA

(SELECTED CLIENT LIST CONTINUED)

Private/Public Companies

Beacon Capital Partners, Boston, MA
Blue Cross/Blue Shield, Boston, MA
Boston Architectural Center, Boston, MA
Boston Scientific Corporation, Watertown, MA
CB Richard Ellis, Boston, MA
Ciba Corning Diagnostics, Walpole, MA
Citicorp/Citibank, New York, NY
Clark Construction Group, Bethesda, MD
David Nassif Associates, Wellesley, MA
DSF Advisors, Boston, MA
Fidelity Properties, Boston, MA
Forest City Management Company,
Cambridge, MA
Genuity, Burlington, MA
HallKeen Management, Inc., Norwood, MA
Harris County Sports and Convention
Corporation, Houston, TX
Hartford Steam Boiler Insurance Co.,
Hartford, CT
Honeywell Bull, Norwood, MA
Keyspan, Boston, MA
Nortel, Billerica, MA
Peerless Insurance, Hartford, CT
Proctor & Gamble, Cincinnati, OH
Prudential Insurance, Dewitt,
NY and Homedell, NJ
Putnam Investments, Inc., Boston, MA
Raytheon Corporation, Waltham, MA
Reliance National, New York, NY
Scudder Investments, Boston, MA
Shawmut Design and Construction,
Boston, MA
Sordoni Skanska, Cambridge, MA
Spaulding & Slye, Boston, MA

The Gillette Company, Boston, MA
TJX Company, Framingham, MA
Trammell Crow Company, Boston, MA
Winthrop Management, Miami, FL

Academic Institutions

Baylor College of Medicine, Houston, TX
Boston College, Chestnut Hill, MA
Boston University, Boston, MA
Harvard Law School, Cambridge, MA
Harvard School of Public Health, Boston, MA
Harvard University, Cambridge, MA
Massachusetts Institute of Technology,
Cambridge, MA
Northeastern University, Boston, MA
Rensselaer Polytechnical Institute,
Rensselaer, NY
The John Hopkins University, Baltimore, MD
University of Cincinnati, Cincinnati, OH
University of Georgia, Athens, GA
University of Houston, Houston, TX
University of Maryland, Baltimore, MD
University of Massachusetts, Amherst, MA
University of New Mexico, Albuquerque, NM
University of Rhode Island, Providence, RI
University of Southern Maine, Portland, ME
University of Vermont, Burlington, VT



(SELECTED CLIENT LIST CONTINUED)

Law Firms

Baron & Budd, P.C., Dallas, TX
Beall, Pelton, O'Brien & Brown,
Albuquerque, NM
Carroll, Kelly & Murphy, Providence, RI
Choate, Hall & Stewart, Boston, MA
Conn Kavanaugh Rosenthal Peisch &
Ford LLP, Boston, MA
Cremer, Kopon, Shaughnessy & Spina,
Wheaton, IL
Davis, Polk & Wardell, New York, NY
Doresey & Whitney, Minneapolis, MN
Foley, Hoag & Eliot, Boston, MA
Goodwin Proctor LLP, Boston, MA
Gordon & Rees, San Francisco, CA
Governo Law Firm, Boston, MA
Hale & Dorr, Boston, MA
Harris, Karstaedt, Jamison & Powers, P.C.,
Englewood, CO
Hill & Barlow, Boston, MA
Holland & Knight, Boston, MA
Jaffe, Raitt, Heuer & Weiss, P.C., Detroit, MI
Kelsch Kelsch Ruff & Kranda, Mandan, ND
Kirkpatrick & Lockhart, Boston, MA
Mahoney, Hawkes & Goldings, Boston, MA
Martin, Magnuson, McCarthy & Kenney,
Boston, MA
Massery & Gillis, LLP, Boston, MA
McDermott, Will & Emery, Boston, MA
Mintz, Levin, Cohn, Ferris, Glovsky and
Popeo, P.C., Boston, MA
Morrison, Mahoney & Miller, Boston, MA
Nutter, McClennen & Fish LLP, Boston, MA
Palmer and Dodge, Boston, MA
Quarles & Brady, Milwaukee, WI
Richardson, Stoops, Richardson & Ward,
Tulsa, OK

Roetzel & Andrews, Akron, OH
Sarrouf, Tarricone & Flemming, P.C.,
Boston, MA
Smith & Duggan, Boston, MA
Swidler & Berlin, Washington DC
Waystack & King, Colebrook, NH

School Departments

Boston Public Schools, Boston, MA
Brookline Public Schools, Brookline, MA
Cambridge School Department,
Cambridge, MA
Chapel Hill, Waltham, MA
CSD High School, Rockport, ME
Dover Public Schools, Dover, MA
Dracut Public Schools, Dracut, MA
Everett Schools, Everett, MA
Lincoln Public Schools, Lincoln, MA
Methuen Public Schools, Methuen, MA
Needham School Department, Needham, MA
Queensbury Union School District,
Albany, NY
Topsfield/Boxford School Department,
Topsfield, MA
Westborough Public Schools,
Westborough, MA
Weston Public Schools, Weston, MA

(SELECTED CLIENT LIST CONTINUED)

Public Agencies

Boston Public Health Commission,
Boston, MA
Boston Public Housing Authority, Boston, MA
Commonwealth of MA, Attorney General's
Office, Boston, MA
Commonwealth of MA, Department of
Environmental Protection, Boston, MA
Federal Deposit Insurance Corporation,
Franklin, MA
General Services Administration,
Washington DC
Massachusetts Turnpike Authority, Boston, MA
National Institute for Occupational Safety
and Health, Cincinnati, OH
National Institutes of Health, Washington DC
New York City Transit Authority,
New York, NY
Office of the Surgeon General,
Washington DC
State of Alaska, Department of Labor,
Anchorage, AL
State of New York Department of Law,
New York, NY
US Department of Justice, Washington DC
US Environmental Protection Agency,
Washington DC
US National Aeronautics and Space
Administration, Washington DC

Municipalities

City of Boston, MA
City of Cambridge, MA
City of Everett, MA
City of Quincy, MA
City of Rockland, ME
City of Somerville, MA
City of Tempe, AZ
City of Waltham, MA
City of Winchester, MA
Town of Andover, MA
Town of Danvers, MA
Town of Dracut, MA
Town of Framingham, MA
Town of Methuen, MA



INDOOR ENVIRONMENTAL QUALITY AND MOLD ASSESSMENTS

Mold Assessment and Remediation

Previously given little attention, mold has become of major concern to building owners and managers throughout the country. EH&E offers a full range of mold assessment services designed to assist building owners and managers in understanding and managing mold concerns, as well as in determining if the mold presents potential hazards to occupant health.

Our staff of internationally recognized microbiologists, toxicologists, certified industrial hygienists, professional and building science engineers, and health risk communication specialists perform all of our mold-related services. EH&E is particularly knowledgeable in state-of-the-art assessment and remediation techniques, building management practices, and legislative initiatives. This allows us to develop the most cost-effective strategies and solutions to any mold problem. The client can also be assured that if remediation is necessary the health and safety of workers and occupants is protected at all times throughout the process.

EH&E's mold related services include the following:

- Building inspection, field sampling, and analysis and interpretation of the samples
- Proactive inspection programs to ensure proper building management to avoid accumulation of moisture that supports mold growth and contamination
- Emergency response plans to manage water damage related events and avoid mold contamination
- Health risk assessments
- Development of health risk communication programs to interpret technical findings
- Data analysis pertinent to potential exposures and exposure reconstruction
- Preparation of remediation plans, performance specifications, and clearance criteria for bids
- Monitoring and oversight of remediation activities
- Periodic reinspection of remediation work to ensure continuing satisfactory performance
- Mold awareness and mold remediation training



Mold growth adjacent to a ceiling vent.

Indoor Environmental Quality Assessment and Remediation

Terms like ‘sick building syndrome’ and ‘building-related illness’ have become part of the public’s lexicon in recent years. People increasingly understand the potential acute and chronic health risks posed by poor indoor environmental quality (IEQ), especially in the workplace. As a result, the public demands and expects healthier work environments from employers, property owners, and building managers.

EH&E is the undisputed industry leader in the field of IEQ management. As the U.S. Environmental Protection Agency’s (EPA) prime IEQ research contractor since 1994, and with over 4,000 building investigations completed, we have assessed environmental conditions in a variety of building types across the United States. Based on our extensive experience in IEQ remediation, we have found that generally there is not one single factor that leads to IEQ problems; rather, poor IEQ is often the result of complex and dynamic interactions between building systems, space use activities, management practices, and occupant expectations.

To be wholly effective, EH&E tailors each IEQ program to account for an organization’s unique environmental situation based on diverse factors such as energy conservation, work flow, or ergonomics. For every client, EH&E will assemble a team of highly trained professionals selected from our staff of specialists in industrial hygiene, toxicology, engineering, chemistry, environmental science, and related fields. This ensures that the project team will have the appropriate knowledge, work-related experience, and technical skill needed to consistently evaluate and make recommendations for a wide variety of situations. Our specialists will formulate technically sound, cost-effective strategies and solutions for every client, and the resulting tailored programs will be designed to account for changes in technologies, products, and regulations.

Organizations that implement our customized IEQ programs can experience the following benefits:

- increase in productivity
- improved morale
- decrease in worker complaints
- decrease in worker absenteeism
- decrease in health insurance costs, and
- decrease in worker compensation claims



EH&E's IEQ practice focuses on three main areas:

Evaluating building systems and materials testing

Optimal IEQ is often directly related to the operational condition of mechanical and ventilation systems. Our thorough inspection and testing process provides essential information on the condition, capacity, appropriateness, and effectiveness of building systems. EH&E's evaluations determine building ventilation rates and air movement pathways through buildings, assess contaminants, evaluate exhaust and intake geometries, and develop proactive monitoring programs.

Remediation planning and oversight

During remediation, the health and safety of building occupants is protected at all times in compliance with applicable regulations and guidelines. EH&E's investigative services include:

- environmental/field sampling
- forensic building investigations
- emergency response
- evaluation of operations
- sampling protocols and interpretation of sampling results
- contractor management



Basidiocarp fungi

Benchmarking indoor air quality

The EPA concluded that indoor air pollution represents a major portion of the public's exposure to air contaminants. In response, EH&E developed the IAQ Benchmark Program, a programmatic approach based on years of experience in the field. The steps for this proactive program include initial evaluation, information gathering, building surveys, monitoring of building performance and environmental parameters, and reviewing and analyzing study findings. This benchmark, developed as a result of reviewing thousands of buildings around the country, is now used by many forward-thinking organizations.



ENVIRONMENTAL HEALTH, SAFETY, AND COMPLIANCE SERVICES

Today's work force is more aware and concerned about the health and safety of their work environment — and rightfully so. With the rapid emergence and continued growth in critical use buildings, including pharmaceutical companies, leading edge research and biotechnology facilities, and the demands of healthcare institutions, work environments are becoming increasingly complex. When hazardous materials, such as chemicals and biological byproducts, are used and stored in areas where people gather and work, the potential health and safety risks are significant. With these changes come more rigorous environmental health and safety programs and regulatory requirements at the federal, state, and local levels.

But how do you know what your specific compliance needs are? How do you manage all the aspects of a comprehensive environmental health and safety program to ensure your employees' well-being? EH&E provides many leading institutions, such as Brigham and Women's Hospital, with complete onsite management of environmental health and safety services. As a direct result of this experience, EH&E understands the EH&S challenges of state-of-the-art and technically sophisticated facilities. We also realize the hard costs associated with a poor environment, including low productivity and business interruptions. We deliver solution-oriented compliance management services designed to:

- Provide a healthy and safe work environment
- Reduce occupational illness and injury
- Minimize workers' compensation claims
- Increase worker morale and productivity



- Ensure compliance to reduce liability, costly litigation and unfavorable publicity
- Avoid OSHA fines and other expensive penalties

By evaluating your organization's operations and goals, we are able to tailor our services to meet your specific needs and ensure that they integrate with your organization's mission.

Exposure Assessments and Industrial Hygiene

EH&E can measure and evaluate worker exposure to contaminants and physical stressors in almost any occupation. Using highly-specialized equipment and sound sampling and analysis strategies, we can monitor for hundreds of chemicals, dust, and biological contaminants. For each assessment, EH&E follows a phased approach and modifies the program to meet the particular needs of your operation. Once the assessment is complete, EH&E will prioritize any identified problems and will provide solutions to address these problems. All analyses are supported by quality assurance programs, including surveys, evaluations, and post-program reviews.

Onsite Program Support

EH&E has developed a unique approach to facilities support which we call the “hub and spoke” model. As a full-service partner, we provide as little or as much assistance as your organization requires. Through this innovative program we have saved our clients significant dollars, improved the operations and developed long-term, trusting relationships.

A client, such as a hospital, requires ongoing environmental management to stay in compliance with many accreditation requirements and federal regulations. Their needs are varied and can range anywhere from ensuring fire safety to requiring a solution to chronic and repetitive nursing staff back injuries. Everything that falls in

between such as hazardous waste disposal or infection control can require significant individual expertise.

That’s where EH&E comes in. Rather than having a department of generalists that by necessity must “learn as they go,” we provide the client with a knowledgeable onsite technical manager who gets to know the entire organization and its unique needs.

Working as a member of the client’s team, the technical manager can draw on the entire range of resources available at EH&E. At the center of the hub is our headquarters in Newton, Massachusetts, housing the core of our specialized service consultants — our industrial hygienists, engineers, and toxicologists — as well as our technical support team of project managers, data analysts and programmers, information services group, technical library and resource support, report production, editing, and field operation support services.

With the EH&E approach, the client is assured of a consistent quality product that provides basic value. Since all of our non-confidential project information is stored in central databases, the technical managers have access to the problem-solving processes utilized in over fifteen years of working on very diverse and complex projects. Furthermore, we have developed several proprietary databases that permit rapid and efficient benchmarking of a wide range of program functions.



Environmental Risk Management

For dealing with environmental concerns, EH&E will conduct the risk assessment and will assist in the development of a customized risk communication program to accurately inform all parties of the situation and the response. Communication is the key to a successful risk management program. During these difficult and high stress situations, our staff's interpersonal and communication skills are essential in containing and minimizing the impact of potential environmental disruptions. EH&E has a proven track record of effectively addressing the concerns of employees and the public regarding environmental risks.

Construction Site Safety

We have developed a list of best practices for managing and maintaining indoor air quality (IAQ) during construction, such as containment programs, selection of safe building materials, and onsite monitoring during construction. Taking precautionary measures will help ensure that your organization's construction program is completed on time with minimal impact on occupant comfort, health, and safety.

Worker Training

EH&E offers their clients customized training in all areas of environmental health and safety and compliance. EH&E will work closely with you to develop a training program that is geared towards your operations and that will

specifically address all your business needs. In addition, we develop numerous high level resources, manuals, and training tools using sophisticated procedures. Developing and implementing a thorough training program to all levels of management and staff not only ensures compliance with regulatory requirements but also keeps employees safe and a business less vulnerable to disruption, liability and workers' compensation claims.

Environmental Compliance and Permitting

EH&E understands the regulatory requirements mandated by federal, state, and local regulations and we can help your organization stay in compliance and abreast of the latest policies and guidelines. EH&E will evaluate your organization's regulatory needs and also assist in maintaining compliance. We have worked with existing facilities to improve compliance, thereby reducing penalties and fines. In addition we have provided support to new facilities including, biotechnology, research, office, and industrial facilities, to help obtain permits required for the start-up of new operations.

EH&E offers a wide range of environmental compliance support services including:

- Hazardous waste and hazardous materials management
- Storage tank management
- Air and water permits
- Fire safety
- Special permits/zoning requirements

Site Assessment and Due Diligence

EH&E is uniquely positioned to be able to assemble a team that can conduct both building *and* site assessments. This includes environmental conditions and potential liabilities associated with a building, its mechanical systems, present and historical operations, the property and its vicinity. EH&E can evaluate the impact of present and historical operations on both the indoor and outdoor environments. EH&E also offers remediation support for a variety of situations, including, asbestos and lead paint abatement, chemical spill clean-up in the indoor and outdoor environment, and management or removal of underground storage tanks.



ENGINEERING AND ENGINEERING SUPPORT SERVICES

Building owners, institutions, and organizations all over the country are discovering that by optimizing a building's performance and trouble-shooting existing problems, they are creating a significantly more productive environment for themselves and their employees. Integrated engineering services improve and maintain building systems in a safe and effective manner while maximizing efficiency, minimizing liability, costly litigation, and unfavorable publicity.

EH&E is widely recognized as the company with the staff, knowledge, and innovation to provide the best in solution-oriented engineering services. EH&E's professional engineers work closely with organizations, institutions, and building owners to protect and maintain occupant health and safety and ensure cost-efficient, high-performance heating, ventilation and air-conditioning (HVAC) system operation. Each and every service is tailored to address the specific environment and needs of the client. From the first walk-through of a project to the final report, we focus on reviewing and understanding a building's HVAC systems, a company's business objectives, and a facility's organizational requirements. This is our assurance that all project work performed by EH&E will meet the needs of the client.

Commissioning/Retro-commissioning

The number one problem reported by owners of newly constructed or renovated buildings is a malfunctioning HVAC system. The goal of EH&E's specialized commissioning process is to identify and correct equipment and operational problems before they affect



building operation and negatively impact occupant health and comfort. When our process is included as part of the original construction contract, a positive impact on schedule adherence and the reduction in change orders and warranty period issues in the construction and building acceptance phases can be significant. EH&E's engineers are also industry leaders in retro-commissioning HVAC systems in existing buildings. We review, verify, and document HVAC systems and make recommendations for enhanced performance, equipment longevity, and potential energy savings.

LEED™ Certification Programs

There is growing awareness that the benefits of a “green” building impacts not only indoor environmental quality but also the attitudes of those within the building. EH&E is an industry leader in optimizing building performance through a pragmatic analysis of design, construction, and building operation.

As a contributing member of the United States Green Building Council (USGBC), we have been involved in many leading-edge environmental building initiatives. Our expertise allows us to provide a range of services to help clients realize Leadership in Energy and Environmental Design (LEED™) under the USGBC. To help you achieve this certification, we:

- review site and building components
- walk clients through the high performing building process
- provide access to our certified LEED™ professional staff
- act as a liaison with the USGBC
- coordinate and submit all documentation for certification
- facilitate design, construction, and operations team involvement in the process

High Performance Building Services

As the earth’s energy and environmental resources are depleting, there is greater responsibility being placed on building owners and designers to emulate the “building of the future.” These buildings — known as high-performance buildings — are designed, constructed, and operated to be healthy, energy-efficient, environmentally friendly, cost-effective, and productive. High performance buildings are now a reality, and EH&E has extensive experience in the commissioning of these types of buildings. Based on our expertise in “green” strategies and technologies, EH&E has designed a systematic process of review, performance verification, operator training, and documentation to ensure that all building operating systems provide the integrated performance required to meet the design intent.



Pollutant Dispersion Modeling

One of the greatest factors in determining the IAQ of a building is the air outside of the structure. Dispersion modeling addresses the relationship of environmental factors between an existing or planned building and its surroundings. For instance, if a newly built hospital facility is next to a laboratory that has exhaust emissions, it is necessary to understand how those emissions are dispersed and how and if they will affect the new hospital and its occupants. EH&E can provide a client with complete dispersion modeling services, including:

- the technical expertise to identify and develop appropriate scenarios for a particular site.
- the access to government approved and private sector computer models and the skills to operate them.
- the knowledge to interpret the quantitative results so that the client can make an informed decision.

This type of modeling provides owners and the building design team the ability to design structures that will not be negatively affected by outside contaminants.

Simulation Modeling

After a structure has been built, a host of previously unseen problems in the design of the building emerge as the building is occupied. These problems can have significant negative impact on factors such as the IEQ of the building, the energy efficiency of the building, the airflow within the structure, or emergency egress routes for occupants. EH&E offers the latest technology in simulation modeling to evaluate the design of a building before it is actually constructed. Our engineers use specialized computer-based modeling to refine the design of interdependent features such as orientation, daylighting, alternative building shell design, and various mechanical system options. The designers and owners of the building can then preview the results of specific choices and obtain an accurate forecast of how the building will operate. In essence, this technology allows building owners and designers to “test-drive” the building before it is constructed.

Life Cycle Analysis

In an enclosed environment such as an office building, hospital or laboratory, it is necessary for companies to evaluate the health and ecological aspects of products and materials that are used during the normal operating life of a building. Using Life Cycle Analysis (LCA), EH&E’s engineering staff can do just this. Our engineers use LCA to compare and substitute various products and materials used in buildings. Ultimately, EH&E can evaluate what the pros and cons are of the use or substitution of materials used by a company. These evaluations are made in terms of what the actual cost-benefits of substitution will be to the company.

Design Review

When an HVAC system performs poorly in a building, the managers can be faced with a significant loss of building efficiency. Indoor air quality can suffer, bacteria can grow in cooling towers, and occupant health can deteriorate, leaving companies at risk for low productivity, excessive sick time, degraded system performance, and possible liability claims. By reviewing the design of the HVAC system prior to installation, potential design deficiencies can be discovered and avoided altogether. The experienced engineering staff at EH&E can completely review an HVAC system design well before the start of construction. Based on their many years of experience, they will identify potential problem areas and present reasoned recommendations for correction. This allows the client to avoid expensive fixes after a building is finished and occupied.

Forensic Evaluations

EH&E has conducted numerous forensic investigations on building systems and on indoor environmental quality to identify and resolve problems. In addition to working directly for the building manager/owner, many of these have been to resolve insurance or legal claims. Working with clients, we recreate the environmental conditions in question and provide clear documentation or deliver expert testimony based on the results of our unassailable findings.

EH&E offers many additional engineering services to improve the design, construction, operation, and maintenance of workplace systems. Services include fire/life safety consulting, code compliance review, systems testing and inspection, waste removal systems design, building systems design and commissioning, construction hygiene management, and program management.



INSURANCE CLAIM AND LITIGATION SUPPORT SERVICES

EH&E has extensive experience in assessing human responses to environmental exposures, evaluating whether there is in fact an environmental link to medical findings and ultimately determining the likelihood of causation. Our professional staff has conducted and managed comprehensive environmental assessment programs, detailed medical assessments, and epidemiological evaluations related to complex indoor and environmental exposures across the United States.

Our broad range of disciplines allows us to assemble the right team for any case and this often results in a better coordinated program for our clients. Our client's potential need for knowledgeable professionals, sophisticated instrumentation, and complex database management is so significant that even large organizations are generally not able to maintain the staff required to run this type of operation. EH&E's team includes specialized service consultants, including industrial hygienists, engineers, and toxicologists. In addition, we house a technical support team of project managers, data analysts and programmers, an information services group, technical library and resource support, report production, editing, and field operation support services.

Many of these assessments have been developed for litigation purposes. EH&E maintains a scientific, research-based approach and adheres to rigorous quality control programs for all our projects. EH&E's internal quality control program ensures that our data and findings are fully documented, legally defensible, and able to withstand the sharpest

scrutiny. EH&E has provided expert services for both plaintiffs and defendants equally — currently very close to 50:50.

EH&E has assessed nearly 4,000 buildings and has been the US Environmental Protection Agency's (EPA) Prime Indoor Environmental Quality Contractor since 1994. Through this contract EH&E has collected detailed personnel and environmental data on 100 randomly selected, non-complaint buildings throughout the country for the Building Assessment Survey and Evaluation (BASE) program. This database provides valuable comparative information and is only one example of our considerable resources.

Document Review and Expert Opinion

EH&E has extensive experience in expert report preparation, depositions, and testimony at trial. We can determine early on if a case has scientific merit. Often, litigation involves exposures that may have occurred years ago. Our multifactorial exposure reconstruction process can provide a range of reasonable exposures, estimate likelihoods and demonstrate potential impacts which can be a very effective strategy for both plaintiffs and defendants.

Our services include:

- testifying experts
- consulting experts
- case evaluation
- exposure reconstruction
- forensic engineering

Insurance Claims Management and Support

EH&E experts can assist Insurance Claims Managers when a case requires a specific expertise, for example mold claims. EH&E has a multitude of microbiological experts available to provide support. We can develop remediation programs, organize the necessary contractors, and oversee the remediation activities to ensure quality. Once the remediation is complete, EH&E can provide testing services to verify the adequacy of the remediation program.

Risk Communication

A key element of the successful outcomes of EH&E's environmental assessment programs and medical studies is effective communication to the many constituencies that require information throughout the project. This includes staff, management, media, the public and more. EH&E has a proven track record in establishing credibility with the various groups and then supplying understandable and accurate information about the complex issues that often surround building investigations.



RESEARCH AND DEVELOPMENT

Research, experimentation, and assessment are the cornerstones of science. The application and integration of new ideas, products, and technology are what keep all scientific fields progressing forward into the future. As a leader in the field of building science, EH&E is looked upon as the company best suited to extend the research, development, and implementation of new products and methods relevant to the indoor environmental industry.

With its expertise in building science and engineering and its vast project experience of over 4,000 building studies, EH&E is known for its cutting-edge research and development activities for governmental agencies, private organizations, and educational institutions. EH&E's research and development work is focused in three general areas.

Product Testing

To maintain leadership in indoor environmental quality and building system consulting, EH&E works tirelessly with companies to test and evaluate monitoring, detection and control devices. A large percentage of our product testing focuses on products that impact IEQ and worker health and safety. We review engineering issues, create in-situ test situations, and make recommendations for changes and improvements. For example, in our field operations support center, we have a testing facility to do full space mock-ups of laboratory layouts to evaluate the performance of various control systems such as fume hoods. We also have a fully instrumented wind tunnel, designed to meet American Society of Heating, Refrigerating, and Air-Conditioning Engineers, Inc. and regulatory



standards. We have used this test facility in projects involving specialty filtration system performance testing designed for biological pathogen contaminant capture.

Recently, EH&E was honored with the prestigious R&D 100 Award (an award that recognizes the top 100 products of technological significance each year) for its work on a portable indoor air quality evaluation system, completed in collaboration with the product developer. The product is an automated indoor air pollution monitoring system that measures and interprets data employing a user-friendly and secure web-based data analysis system. This enables building management to diagnose and maintain air quality without the need for

onsite technical personnel. This award-winning innovation was selected over competing distinguished companies, research organizations, and universities in the world.

Another significant step was made when EH&E entered into a joint venture with an international computer technology company to become their North American distribution and technical support center for their virtual environment software system. This software enables architects, engineers, building owners and property developers to model and predict the performance of a building at any stage during the design process. This groundbreaking software system will give clients the added benefit of predicting and visualizing how a proposed building will perform early in the design review process, well before construction begins. As a result, building efficiency will be optimized and time and money will be saved in the construction process.

Field Studies and Research

Environmental research involves analyzing, documenting and validating data in unique, real-life situations. Our field research team:

- develops tailored, innovative sampling and inspection protocols to effectively address the hypothesis being tested
- implements and conducts the studies
- gathers and develops databases for the study results
- analyzes data results, and
- uses proprietary databases for comparison with these investigations and studies

An example of this type of work is the Building Assessment Survey and Evaluation (BASE) study we conducted for the EPA. This multi-year, comprehensive indoor environmental testing program was conducted in 100 buildings throughout the US. The data collected and analyzed by EH&E created a benchmark against which the indoor air quality of buildings of similar types can be measured.

Policy Analysis

Environmental policy is important for government institutions and agencies as well as both public and private institutions. Good environmental policy is based on economic analysis, risk analysis, and rigorous science. EH&E has provided extensive support to evaluate what policies should be established, what the correct parameters should be for the policies, and if the institution is capable of effectively implementing them. EH&E's experience includes projects that determined the feasibility of standards and guidelines relative to indoor environmental quality, as well as economic analysis of various benchmark standards.



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