

Evaluation of Indoor Environmental Quality in Police Evidence Intake, Processing, and Storage Areas at a Medical Examiner's Office

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The cover photo is a close-up image of sorbent tubes, which are used by the HHE Program to measure airborne exposures. This photo is an artistic representation that may not be related to this Health Hazard Evaluation. Photo by NIOSH.

Highlights of this Evaluation

The Health Hazard Evaluation Program received a request from employees at a medical examiner's office building. Employees working in the police evidence intake, processing, and storage areas on the subbasement 1 floor were concerned about inadequate ventilation.

What We Did

- We made a site visit in March 2015.
- We measured temperature, relative humidity, carbon monoxide, and carbon dioxide in the evidence intake, processing, and storage areas on the subbasement 1 and fifth floors.
- We looked at the building's heating, ventilating, and air-conditioning systems.
- We measured air quantity at supply diffusers on the subbasement 1 floor.
- We interviewed employees about their work history and health and safety concerns.
- We reviewed work-related injury and illness reports.

We evaluated the indoor environmental quality in the police evidence intake, processing and storage areas of a medical examiner's office. We found inadequate ventilation on the subbasement 1 floor. We recommended adjusting the ventilation system so that air is supplied as designed and meets current ventilation guidelines for indoor environmental quality.

What We Found

- Airflow from the supply diffusers on the subbasement 1 floor was less than originally designed.
- Most temperature measurements were outside (both above and below) the recommended range for employee comfort.
- Employees in the police evidence intake, processing, and storage areas reported that they were often too hot or too cold in the building. They also felt that airflow and air circulation were inadequate and that the workplace was not clean enough. They reported lacking training on handling accidental chemical or biological spills.
- Some employees reported upper and lower respiratory symptoms, skin symptoms, and nonspecific symptoms that have been associated with conditions inside and outside the workplace.

What the Employer Can Do

- Adjust the ventilation system so air is supplied as designed and meet current ventilation guidelines for indoor environmental quality.
- Keep temperature and relative humidity within comfort guidelines.
- Improve housekeeping on the subbasement 1 floor.

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- Provide additional biohazard waste receptacles on the subbasement 1 floor.
 - Improve communication between managers and employees regarding employee health and safety concerns.
 - Encourage employees to report potential work-related health and safety concerns to their supervisors.
 - Do not permit eating or drinking where evidence is handled and processed.
 - Develop standard operating procedures for cleaning incidental chemical or biological spills.

What Employees Can Do

- Eat or drink only in designated areas and not at work desks.
- Report work-related health concerns to your supervisor. Seek evaluation and care early from a healthcare provider who is knowledgeable in occupational medicine and indoor environmental quality issues.

Abbreviations

°F	Degrees Fahrenheit
AHU	Air handling unit
ANSI	American National Standards Institute
cfm	Cubic feet per minute
CO	Carbon monoxide
CO ₂	Carbon dioxide
CFR	Code of Federal Regulations
EPA	U.S. Environmental Protection Agency
IEQ	Indoor environmental quality
ND	Not detected
NIOSH	National Institute for Occupational Safety and Health
ppm	Parts per million
RH	Relative humidity
S1	Subbasement 1 floor

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Introduction

The Health Hazard Evaluation Program received a request from employees in a medical examiner's office building. Employees in the police evidence intake, processing, and storage areas (evidence property control specialists) were concerned about inadequate ventilation. We made a site visit in March 2015. We held an opening meeting with managers and union representatives followed by a walk-through survey of the areas of interest on the subbasement 1 (S1) and fifth floors. At the conclusion of our site visit we held a closing meeting with managers and union representatives. We sent a summary letter in March 2015 with our preliminary findings and recommendations.

Methods

Our objectives were to:

1. Evaluate the indoor environmental quality (IEQ) in the police evidence intake, processing, and storage areas on the S1 and fifth floors and compare it to the office area on the tenth floor which reportedly had no problems with IEQ.
2. Determine whether employees working on the S1 and fifth floors were experiencing work-related health symptoms or had concerns.

Environmental Assessment

During our walk-through survey of the police evidence intake, processing, and storage areas we looked for evidence of past or current water damage, water incursion, and mold. We measured temperature and relative humidity (RH) over 2 days with HOBO® H8 ProSeries data loggers. We measured temperature and RH because they can affect how employees perceive thermal comfort in their indoor environment. We also measured carbon dioxide (CO₂) and carbon monoxide (CO) over 1 day with a TSI Q-TRAK™ Plus Indoor Air Quality Monitor Model 8554. We compared indoor and outdoor CO₂ concentrations to determine if indoor occupied spaces were adequately ventilated [ANSI/ASHRAE 2013a]. Carbon dioxide is a normal constituent of exhaled breath and can be used as an indicator of whether enough outdoor air is being introduced into an occupied space to maintain odors to an acceptable level. We measured CO concentrations because evidence was unloaded from city vehicles in a parking area adjacent to the S1 receiving area and CO is present in vehicle exhaust.

We visually inspected the air handling units that supplied the S1 and fifth floors and reviewed maintenance procedures. We measured the supply air flow from ceiling diffusers in the S1 evidence intake, processing, and storage areas, and part of the fifth floor evidence intake, processing, and storage areas with an Accubalance EBT 731 ventilation flow hood. We compared those measurements with the design specifications referenced in the ventilation system commissioning report. We used ventilation smoke tubes to visualize airflow direction in the S1 evidence intake, processing, and storage areas and the hallway outside of these areas.

Employee Interviews and Record Review

We obtained a roster of all evidence property control specialists working on the S1 floor during our evaluation and interviewed all of those present during our site visit. We asked them about work-related safety issues, and any health symptoms or concerns they thought could be related to their work. We reviewed an environmental survey conducted at the request of the medical examiner's office, as well as work-related injury and illness logs, a health and safety incident report, the respiratory protection program, the bloodborne pathogens exposure control plan, and employee training attendance records from 2014.

Results and Discussion

Unlike specific medical diagnoses of upper and lower respiratory disease, such as humidifier fever and asthma, most symptoms associated with IEQ concerns do not result in persistent health problems. Many of the non-specific symptoms commonly reported by building occupants have been found to improve when deficiencies in the building environment (including heating, ventilating, and air-conditioning systems) are addressed. Measurements of ventilation and comfort indicators such as CO₂, temperature, and RH below provide information relative to the functioning and control of the heating, ventilating, and air-conditioning systems.

General Observations

The 15-story medical examiner's office building was constructed in 2006. The main entrance and lobby were on the first floor and an auditorium was on the second floor. Forensic laboratories were located on floors 5–8, and offices were on floors 4, 10, 11, and 12. Mechanical rooms containing air handling units for the offices and laboratories were located on floors 3, 9, 14, and 15.

The focus of our evaluation was the police evidence intake, processing, and storage areas on the S1 floor and on the fifth floor. The larger of these two areas in number of personnel and square footage was on the S1 floor. The police evidence intake, processing, and storage areas were staffed by approximately 25 evidence property control specialists and 2 other employees (administrative, clerical) working at this building over two shifts. Work activities included receiving the evidence that was delivered in the morning, logging the evidence into the computer tracking system, printing labels for the evidence packaging, and then placing the evidence in storage. The types of evidence stored included packaging containing bloody clothes, products of conception, weapons, and larger items such as car bumpers. Some prescription drugs were stored in sealed plastic boxes; however, no other drug evidence was stored in this building. Similar work tasks occurred on the fifth floor except that evidence was stored for a shorter time. No IEQ management program was in place at the time of our visit.

We saw no evidence of dampness or mold growth, nor did we detect any musty odors. We did see some areas of past water damage on the masonry wall above the suspended ceiling in the S1 evidence storage area that was also near discolored sprayed-on insulation. We learned from the facilities maintenance office that employees of the medical examiner's

office previously washed vehicles and equipment in a loading dock and emergency medical services garage located a floor above the evidence storage area. This practice was stopped after the discovery that wash water was infiltrating from the loading dock and garage to other areas, including the evidence storage area. In addition to discontinuing the washing, a water resistant epoxy sealant was applied to the loading dock and garage floors.

Employees may handle evidence potentially contaminated with blood or other body fluids. We observed employees wearing nitrile or vinyl gloves while handling and processing evidence at their desks. During our visit, we saw a few employees eating at their desk. We also found used gloves, which should be considered potentially biohazardous waste, in regular waste receptacles. We saw no biohazardous waste containers on the S1 floor, although employees reported that they did have “a few.” No written procedures were in place for cleaning up biological or chemical spills.

Employees reported that housekeeping in the evidence storage area on the S1 floor was infrequent, and institutional aides who performed the housekeeping were not permitted to move any of the evidence. As a result, the shelves where the evidence was stored were not cleaned. We did see shelving that appeared dusty during our walk-through surveys. The current cleaning policy was to clean the evidence storage areas “as needed.” Managers reported that funding for a heavy-duty deep cleaning of the evidence storage area would be available on July 1, 2015.

Temperature, Relative Humidity, Carbon Dioxide, and Carbon Monoxide

Table 1 presents the temperature, RH, CO₂, and CO levels on the S1, fifth, and tenth floors of the building. Although storage areas typically are not considered offices, permanent workstations, where employees could spend a full shift, were located in these areas. The American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE) recommended thermal comfort guidelines for the winter season (using a clothing insulation value of 1.0) are approximately 71°F–79°F and 0%–60% for general office spaces [ANSI/ASHRAE 2013b]. ASHRAE recommends that evidence vaults have temperatures between 72°F–74°F and relative humidity at 30% in winter and no more than 50% in summer [ASHRAE 2011]. The outdoor daytime temperatures ranged from 44°F–76°F, and outdoor RH ranged from 14%–100% during our evaluation. Seven out of eight indoor locations were not within the recommended thermal comfort guidelines for the winter season. Temperature measurements were at times, above and below the recommended guidelines. The lowest RH levels were below the ASHRAE guideline for evidence vaults.

ASHRAE notes in an informative appendix to standard 62.1 that indoor CO₂ concentrations no greater than 700 parts per million (ppm) above outdoor CO₂ concentrations will satisfy a substantial majority (about 80%) of visitors with regard to body odor from sedentary building occupants [ANSI/ASHRAE 2013a]. Elevated CO₂ concentrations suggest that other indoor contaminants may also be increased. If CO₂ concentrations are elevated, the amount of outdoor air introduced into the ventilated space may need to be increased. None of the CO₂ concentrations in the areas that we tested exceeded the outdoor concentration by 700 ppm.

CO levels ranged up to 1.2 ppm inside the building, well below the lowest occupational exposure limit for CO of 25 ppm recommended by the American Conference of Governmental Industrial Hygienists [ACGIH 2015].

Table 1. Temperature, relative humidity, carbon dioxide, and carbon monoxide levels, March 2015

Location	Temperature range (°F)	Relative humidity range (%)	Carbon dioxide (ppm)	Carbon monoxide (ppm)
S1 intake area 1	70–75†	14–35	400–720	ND–1.2
S1 intake area 2	72–76	13–31	440–770	ND–0.7
S1 clerical desk	71–80†	11–30	*	*
S1 storage area	68–72†	15–38	420–670	ND–0.9
S1 storage area	66–72†	15–39	*	*
Fifth floor intake area	68–73†	14–45	*	*
Fifth floor storage area	66–72†	14–44	370–460	ND–0.5
Tenth floor office	70–74†	13–38	440–550	ND–0.1
Outdoors	44–76	14–100	410–670	0.9–5

ND = Not detected

*No sample collected

†Temperatures were not within recommended guidelines for general office areas and evidence storage vaults for the winter season [ASHRAE 2011; ANSI/ASHRAE 2013b].

Ventilation

Heating and air-conditioning for the evidence intake, processing, and storage areas on the S1 floor were provided by one variable air volume air handling unit (AHU) that was located in an adjacent mechanical room on the S1 floor. The outdoor air intake for this AHU was located on the third floor. The AHU used 24" × 24" × 2" minimum efficiency reporting value 8 pleated air filters that were changed every 2–3 months. All of the air filters were properly installed and appeared clean. The S1 AHU, along with all of the AHUs in the building, were also equipped with air filter back-pressure monitors that notified the maintenance staff when to change the air filters. Maintenance staff changed the air filters more frequently than required by the back-pressure filter monitors.

We looked in the space above the suspended ceiling, also called the plenum, in the S1 evidence intake, processing, and storage areas. We saw no damage to the variable air volume boxes or to the rigid or flexible ducts connecting these boxes to the ceiling supply diffusers or to the AHU. The plenum was also free of visible debris, and we observed no evidence of past or current water damage aside from what we previously noted in the S1 evidence storage area that had been the result of water draining from a loading dock and a garage.

Table 2 presents the airflow measurements from the ceiling diffusers in the S1 evidence processing and storage areas. Prior to our measurements we asked the maintenance

department to adjust the variable air volume system in these areas to provide maximum airflow. The diffuser locations are shown in Appendix A, Figure A1. Nearly all airflow rates were below the original design specifications for this area, with the largest airflow deficits in the evidence repackaging room. Low airflow can result in poor air distribution and the perception by employees that the air is stagnant. It can also make it difficult to consistently maintain temperature and RH levels within recommended comfort guidelines. The unbalanced airflows likely account for the use of portable air-conditioning units in the S1 evidence intake and processing areas at the time of our evaluation. After we completed our evaluation, we asked the maintenance department to return the variable air volume system to its normal operating conditions, and then we randomly rechecked airflow at some of the air supply diffusers. We found the airflow was essentially the same (within 10%) as the maximum capacity airflow that we previously measured. Potential causes for the airflow rates being below the design criteria include: improper operation of the variable air boxes, blockage of the supply air in the duct before reaching the ceiling diffusers, small supply ducts, improperly sized fan and motor, or presence of an air leak somewhere in the ductwork.

Using ventilation smoke tubes, we found that air flowed from the S1 evidence intake area to the hallway that separated the evidence area and an adjacent vehicular parking area. Within the S1 evidence areas air flowed from the evidence storage area into the evidence intake and clerical areas, and the air pressure was neutral between the two S1 evidence intake areas.

ASHRAE does not provide specific exhaust ventilation flow rate recommendations for drug vaults or evidence storage rooms but recommends that they be kept under negative pressure [ASHRAE 2011]. This recommendation is mainly intended to keep odors from drugs stored in the vault from migrating to adjacent occupied spaces. The American National Standards Institute (ANSI)/ASHRAE Standard 62.1-2013: *Ventilation for Acceptable Indoor Air Quality* provide specific details on ventilation for acceptable indoor environmental quality. The purpose of the standard is to specify “minimum ventilation rates and other measures intended to provide indoor air quality that is acceptable to human occupants and that minimize adverse health effects” [ANSI/ASHRAE 2013a]. Generally, the standard recommends outdoor air supply rates to indoor occupied spaces that take into account people-related sources as well as building-related sources.

Table 2. Supply air measurements on S1 floor*

Location	Actual airflow (cfm)	Design airflow (cfm)
Intake 1		
A†	69	150
B	51	150
C	74	150
Intake 2		
D	59	150
E	89	150
F	77	150
G	66	150
H (Repacking room)	28	150
I	84	150
J	92	150
K	119	200
L	75	150
M (Directors office)	56	100
II	214	150
Clerical desk		
N	102	200
O	99	200
P	109	200
Q	89	200
R	83	200
S	67	200
Evidence storage		
T	215	320
U	Inaccessible	320
V	Inaccessible	320
W	189	320
X	Inaccessible	320
Y	129	400
Z	151	400
AA	116	400
BB	147	400
CC	Inaccessible	400
DD	127	400
EE	Inaccessible	400
FF	137	400
GG	Inaccessible	200
HH	Inaccessible	640

cfm = Cubic feet per minute

*Evidence intake, processing, and storage areas on S1 floor

†Diffuser locations shown in Appendix A, Figure A1

Table 3 presents the airflow measurements from the ceiling diffusers in the fifth floor evidence processing and storage areas. The diffuser locations are shown in Appendix A, Figure A2. We were not provided with the ventilation design specifications for this floor. We did not measure the airflow from the four ceiling supply diffusers in the center of the fifth floor evidence intake area because they were larger than our ventilation hood could accommodate.

Table 3. Supply air measurements on the fifth floor

Location	Actual airflow* (cfm)
Evidence storage	
A	489
B	515
C	465
D	344
E	329
F	298
G	272
H	315
Evidence intake	
I	80

*Design airflow for fifth floor evidence areas was not provided

Medical Interviews

We held confidential interviews with 21 of 27 employees who currently worked or had worked in S1 evidence intake, processing, and storage areas. Interviewed employees reported working in the building an average of 6 years (range: 4 months–10 years), their average age was 45 years (range: 32–63), and 13 (62%) were male. Although most interviewed employees spent the majority of their work time in the S1 evidence and storage areas, some employees split their work time between the S1 floor and the fifth floor. Two employees who no longer worked in S1 now had offices on a different floor or in a different building.

Interviewed employees were asked to respond “yes” or “no” to a question regarding general cleanliness and temperature of the S1 floor and fifth floor. Nineteen of the 21 interviewed employees (90%) reported they were not satisfied with general cleanliness of the S1 floor but only 3 of 21 (14%) were not satisfied with general cleanliness of the fifth floor. Eighteen of 21 interviewed employees (86%) reported they were not satisfied with the temperature on the S1 floor and mentioned that it was either too hot or too cold, and 7 of 21 (33%) were not satisfied with the temperature on the fifth floor.

Interviewed employees were also asked to rate their level of satisfaction with the air quality on the S1 floor (e.g., stuffy/stale air, cleanliness, odors) on a scale from 0 (very dissatisfied) to 7 (very satisfied) adapted from Lee [2007]. Of the 21 interviewed employees, the average response was 1.8 (range: 0–5). We asked employees an open-ended question regarding what, if any, safety concerns they had about their work. Nineteen of 21 interviewed employees reported concerns. These safety concerns included perceived lack of airflow and air circulation; lack of workplace cleanliness; dust and air contamination; exposure to cold weather when doors are opened; and lack of training on driver safety, lifting equipment, and handling accidental chemical or biological spills.

We asked employees what, if any, health concerns they had that they believed were related to their work in the building. Seventeen of 21 interviewed employees (81%) reported health concerns. These health concerns included upper respiratory symptoms (irritated eyes, nose, and throat), lower respiratory symptoms (difficulty breathing, tight chest, shortness of breath), constitutional symptoms (weakness, fatigue, headache, nausea), and skin symptoms (dry and itchy skin, skin rash). These non-specific symptoms can have many causes and have been shown to be associated with certain working conditions (e.g., dampness, poor sanitation, poor ventilation) or be non-work related. Complaints of being too hot or too cold have been associated with headaches [Tietjen et al. 2012]. We saw no evidence of dampness on the floors evaluated, but did see some areas of past water damage as well as current operation of portable air-conditioning units which may have contributed to the respiratory symptoms reported by some of the employees. The World Health Organization stated that there was sufficient epidemiological evidence (based on review up to July 2007) to conclude that occupants of damp buildings are at risk of developing upper and lower respiratory tract symptoms (including cough and wheeze), respiratory infections, asthma, and exacerbation of asthma [WHO 2009]. Certain symptoms may be affected by personal health factors (e.g., pre-existing asthma, allergies, and respiratory infections). Research in office buildings has shown a dose-response relationship between the number of office exposures and risks of headache, tonsillitis, and sinus infections [Jaakkola et al. 2007]. In a study of office workers, authors found that the prevalence of certain symptoms (mucous membrane symptoms, fatigue, skin irritation, and headaches) decreased after employees moved to a building with improved mechanical ventilation, air-conditioning, and sealed windows [Bourbeau et al. 1996].

Logs of Injuries and Illnesses

The New York State Department of Labor Log of Work-Related Injuries and Illnesses Form SH-900 included 49 injuries and 14 illnesses for the years 2010–2014. Musculoskeletal pain, strain, and/or inflammation was the most common type of injury or illness, accounting for 40% of reports. Laceration/puncture was the second most common reported injury and accounted for 22% of reports. Slips, trips, and falls accounted for 17% of reports, hand/foot crush injuries and not otherwise classified injuries each accounted for 8%, and other injuries (i.e., contusion, fracture) accounted for 5%. Only five incidents were reported by evidence property control specialists for 2010–2014, one fall and one musculoskeletal injury in 2013 and three motor vehicle accidents in 2014.

Bloodborne Pathogens and Respiratory Protection Plan

The medical examiner's office bloodborne pathogens exposure control plan met all the requirements of 29 CFR 1910.1030. It identified evidence property control specialists as employees with possible occupational exposure to bloodborne pathogens and identified tasks and procedures that could lead to exposure. The plan listed standard precautions to prevent occupational exposures, as well as engineering controls such as sharps containers, work practices such as hand washing and spill proof containers for specimens, and personal protective equipment such as gloves and surgical masks. It also specified a clean-up procedure and included the need for red biohazard bags for regulated medical waste other than sharps. The plan stated that initial employee training shall occur during the first week of hire and annually thereafter; refresher training should be provided as needed.

The respiratory protection plan met all of the elements required by 29 CFR 1910.134 including provisions regarding the voluntary use of respirators. Respirators were not required for employees working in the police evidence intake, processing, and storage areas. We did not observe respirator use during our evaluation, but employees wore surgical masks to protect the evidence from contamination while processing it.

The training attendance records for 2014 indicated that all but two of the evidence property control specialists received annual right-to-know training that covered topics including the hazard communication standard, respiratory protection, bloodborne pathogens, and ergonomics. According to the medical examiner's office the two employees who did not attend the annual 2014 training will be included in an upcoming training session.

Conclusions

We identified several correctable IEQ problems in the police evidence intake, processing, and storage areas at the medical examiner's office building, in particular inadequate ventilation on the S1 floor. Some of the symptoms reported by employees, such as headache, fatigue, skin irritation, and respiratory symptoms have been associated with dampness and inadequate ventilation, but are also common in offices, schools, and the general population when dampness or ventilation is not a problem.

Recommendations

On the basis of our findings, we recommend the actions listed below. We encourage the medical examiner's office to use a labor-management health and safety committee or working group to discuss our recommendations and develop an action plan. Those involved in the work can best set priorities and assess the feasibility of our recommendations for the specific situation at the medical examiner's office.

Our recommendations are based on an approach known as the hierarchy of controls. This approach groups actions by their likely effectiveness in reducing or removing hazards. In most cases, the preferred approach is to eliminate hazardous materials or processes and install engineering controls to reduce exposure or shield employees. Until such controls

are in place, or if they are not effective or feasible, administrative measures and personal protective equipment may be needed.

Engineering Controls

Engineering controls reduce employees' exposures by removing the hazard from the process or by placing a barrier between the hazard and the employee. Engineering controls protect employees effectively without placing primary responsibility of implementation on the employee.

1. Conduct a comprehensive assessment of the S1 floor ventilation system in consultation with a licensed professional engineer (mechanical engineering) who has experience in the design of heating, ventilating, and air-conditioning systems for evidence storage environments, followed by testing and balancing the ventilation system.
2. Ensure the temperature and relative humidity in the building meet current guidelines for offices [ANSI/ASHRAE 2013b].
3. Ensure the minimum ventilation rates, introduction of outdoor air versus recirculated air, and exhausted air provides indoor air quality that is acceptable to human occupants and that minimizes adverse health effects [ANSI/ASHRAE 2013a].
4. Improve the frequency and thoroughness of housekeeping, including cleaning dust from areas where evidence is stored or processed especially on the S1 floor.

Administrative Controls

The term administrative controls refers to employer-dictated work practices and policies to reduce or prevent hazardous exposures. Their effectiveness depends on employer commitment and employee acceptance. Regular monitoring and reinforcement are necessary to ensure that policies and procedures are followed consistently.

1. Start an IEQ management program. An IEQ manager or administrator with clearly defined responsibilities, authority, and resources should be selected. This individual should have a good understanding of the building's structure and function, and should be able to communicate effectively with employees. Although no comprehensive regulatory standards specific to IEQ have been established, guidelines have been developed by organizations and agencies, including ASHRAE, the National Institute for Occupational Safety and Health (NIOSH), and the U.S. Environmental Protection Agency (EPA). These resources are available from the NIOSH Indoor Environmental Quality topic page at <http://www.cdc.gov/niosh/topics/indoorenv/>.
2. Include an employee representative in the IEQ management program to assist with communication. The NIOSH/EPA document, "Building Air Quality: A Guide for Building Owners and Facility Managers" may be helpful and is available at <http://www.cdc.gov/niosh/pdfs/iaq.pdf>. A companion NIOSH/EPA guide, "Building Air Quality Action Plan," discusses how to develop and assess an IEQ management program and is available at <http://www.cdc.gov/niosh/docs/98-123/pdfs/98-123.pdf>.

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3. Improve communication between all managers and employees regarding employee health and safety concerns. Employees should be informed what actions have been or will be taken regarding their concerns and the rationale for decisions, and their concerns should be addressed in a timely manner.
 4. Encourage employees to report potential work-related health concerns to their supervisors and to seek evaluation and care from a healthcare provider who is knowledgeable in occupational medicine and IEQ issues.
 5. Ensure sufficient biohazard waste receptacles are on the S1 floor.
 6. Do not permit eating or drinking where evidence is handled and processed.
 7. Develop standard operating procedures for cleaning chemical or biological spills.

Appendix A: Figures

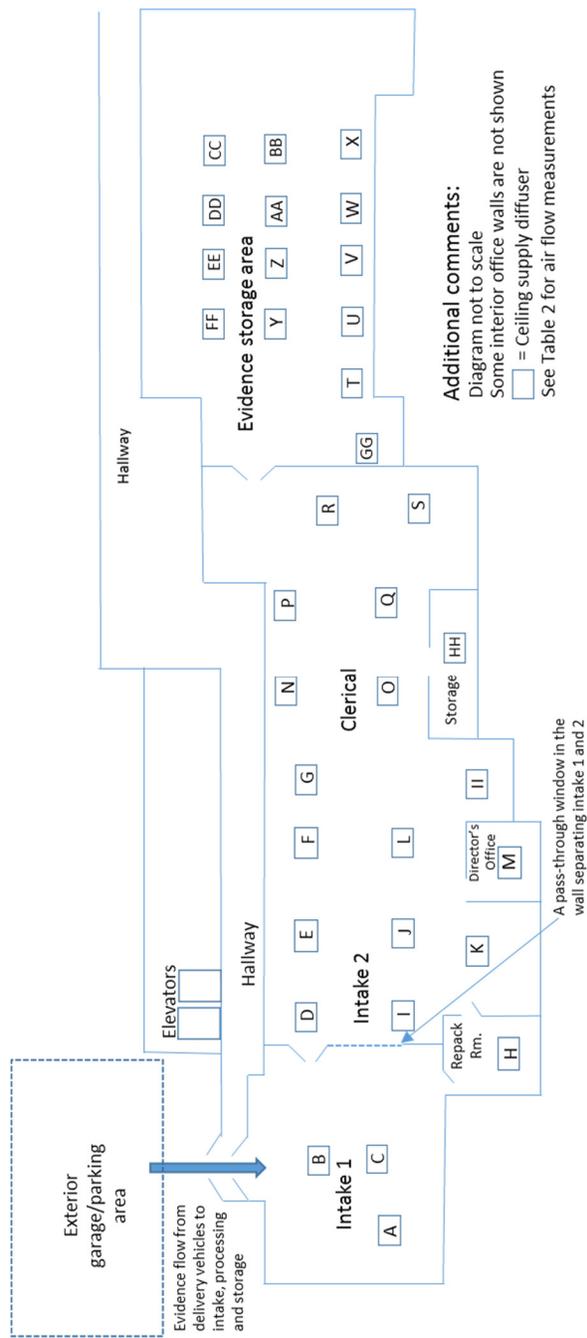
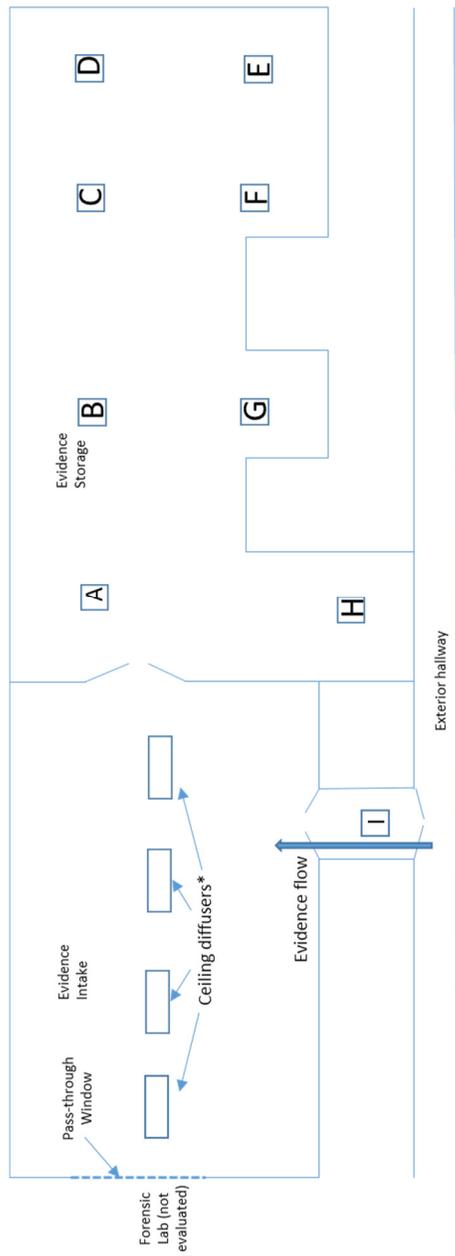


Figure A1. Supply diffusers in sublevel 1 evidence intake, processing, and storage areas.



Additional comments:

Diagram not to scale

See Table 3 for air flow measurements

Evidence intake was under positive pressure relative to evidence storage

* Ceiling diffusers were 2'X4' and too large to evaluate with flow hood

Figure A2. Supply diffusers in the fifth floor evidence intake, processing, and storage areas.

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