

ENVIRONMENTAL HEALTH AND SAFETY

Case Western Reserve University, Department of Environmental Health and Safety
Annual Report 2016-2017

*Annual Report
2016-2017*

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Mission Statement

Case Western Reserve University Department of Environmental Health and Safety

We protect the Environment and the university by acting in a regulatory responsible manner that both respects personnel and the research objectives of the community

We protect the Health and Safety of the CWRU community by providing the support and knowledge required to maintain a healthy and safe workplace

Notable Accomplishments 2016-2017

PROGRAM CHANGES:

Implemented Hazardous Materials Campus Wide Survey

Many hazards exist on the campus with respect to research materials. In an effort to identify and mitigate hazards, a survey of the type and magnitude of hazard present on campus from hazardous materials is underway. The first survey covers compressed gas installation; the second is compressed gas general lab use. The initial portion of these surveys were completed and hazard mitigation and process safety plans are being formulated. Implementation of findings began in June 2017

Developed and Implemented Arc Flash Program

Working with high voltages presents a number of challenges. One of the hazards associated with this type of work is the possibility of an arc over resulting in an intense pulse of light and heat. This is called an arc flash. Special training and safety equipment is required to prevent injury in the event of an arc flash. The arc flash program was implemented on campus in 2017.

Developed and implemented a comprehensive confined space survey of the campus.

An effort to identify and classify each confined space on campus to augment the existing confined space and lock out tag out program was accomplished. Each confined space was mapped, labeled, and the procedure for entry assembled. This catalog of spaces and requirements was communicated to all facilities workers along with training to adequately provide the skills needed to enter the identified spaces.

Developed and implemented a program to address Silica and dust from construction

OSHA published a reduction in the allowed exposure to silica dust. CWRU put together a strong program to address the change that includes air sampling of routine procedures. This testing allows exposures determinations of silica during routine work. No problem exposures have been identified yet. For untested procedures, workers are trained to function in much the same manner as asbestos workers and to assume the materials they are working with could be a problem. Hence wet methods, PPE, and dust control is used whenever disturbing silica containing materials.

Developed and implemented a new Safety Shoe and Eye protection

Delivery of safety equipment to facilities workers in years past included a program that brought safety equipment to maintenance employees on CWRU's campus. This program was revisited in 2017. A truck with safety shoes and eye protection is now provided annually allowing maintenance workers on all shifts to get new shoe and eyewear equipment on campus each year. The selections are then tracked with Grainger's software.

Implemented a Survey of Machine Shops

A comprehensive survey of machine shops was conducted after the tragedy at Yale in 2010. The survey was updated to assure compliance with guarding and other safety standards. The BWC was once again used to conduct this survey. The results of the survey point to a definite need for a dedicated person to address machine safety in general on campus. To this end, EHS is proposing such a position and working to build a partnership with the respective schools utilizing machines. This will then expand to student groups such as the racing and robotics teams and eventually in to the individual labs such as polymer labs utilizing 3d printing technologies. This is a fast growing area of safety and the need will only increase over time.

Updated Facilities Job safety Analysis (JSA) book

The facilities group functions are broken out as job safety classifications. This information is provided to all facilities workers so they know the safety requirements for the work they perform. The book was updated to reflect the present work conducted.

Hired New Safety Specialist and Fire Safety Specialist

A new Fire and Life Safety Specialist was hired to replace the outgoing person

Implemented Asbestos Training for Custodial workers

The asbestos program was updated and the training given to custodial workers expanded to better meet the asbestos standards requirements.

Implemented Ethylene Oxide program

A laboratory decided Ethylene Oxide sterilization was the only method available that could meet their requirements. A full program including monitoring was implemented to address this need.

Implemented Working Alone in laboratories program

A program to address students, staff, and faculty working alone in laboratories was put into place and approved by the CWRU Lab Safety Committee.

Implemented new laboratory door sign program

The existing emergency door signs were in an aging condition and the information was generally out of date. To address this situation, EHS is rolling out new signs to the entire campus. Additionally, the contact information is being gathered electronically to generate a master contact list for all laboratories. A second major change is that the door sign now includes the information regarding any PPE requirements required to ENTER the space. This is not the PPE requirements for WORKING in the space but is intended to alert any non-lab personnel of requirements regarding entry to the space.

Updated ECP and CHP plans

The Exposure control and chemical hygiene plans are being updated to better capture and convey the requirements for safety in the laboratories. Each plan is being reviewed by EHS for completeness by area experts and suggestions are being made to help the investigator better communicate the lab specific safety portions of the plans. Later in the year, these plans are expected to be included in a new online electronic system that will help organize each lab's safety information and chemical inventory information.

Updated all web training to new LMS

All existing training was migrated from Blackboard to Canvas. During this period, all training was updated for content.

Completed the liquidation of the Chemistry Ready Reserve Chemical System 10,000 containers

Approximately 10,000 containers of old chemicals were removed from chemistry at a cost of 85,000.00. These chemicals were removed to make space for the new chemistry stockroom and laser facility. An additional 40,000.00 worth of disposal was also taken from chemistry as part of lab clean outs for retiring faculty. The present size of the entire hazardous waste budget for a year is around 250,000.00 thus this removal was a hardship on the program. This required that some of these costs be shifted to the 2017-2018 budget period.

AGENCY INSPECTIONS

The CDC inspected the BRB biosafety level three BSL3 facilities

The facility successfully passed the inspection

The Cleveland Department of Health conducted six inspections of the Sani Pak facility

All inspections were passed with the exception of a paperwork discrepancy that was resolved when the missing paperwork was found.

The Ohio EPA inspected the campus the campus

A notice of violation was issued but no fine was levied for paperwork and labeling violations in the laboratories. As a result, an intensive effort is underway to resolve the issues found. This effort includes third party inspections and training. Part of this effort will involve offering formal EPA RCRA training to all students and staff and faculty. This training will be official and portable such that the certification can be put on a resume and be of use to graduates during interviewing. Further, an enhanced SOP for hazardous waste is being put together that will be reviewed and approved by OEPA in an effort to strengthen the program and ties to OEPA.

Part of the inspection involved the retired Morley Hall waste room. The OEPA did not have record of the closure of the facility from 1994. As a result, a new closure was conducted for the facility.

Part of the inspection included the Cedar Service Building. An abandoned oil tank was discovered and removed.

MISCILLANEOUS

Completed remodeling of EHS offices

Began process for new Medical School and Dental School opening

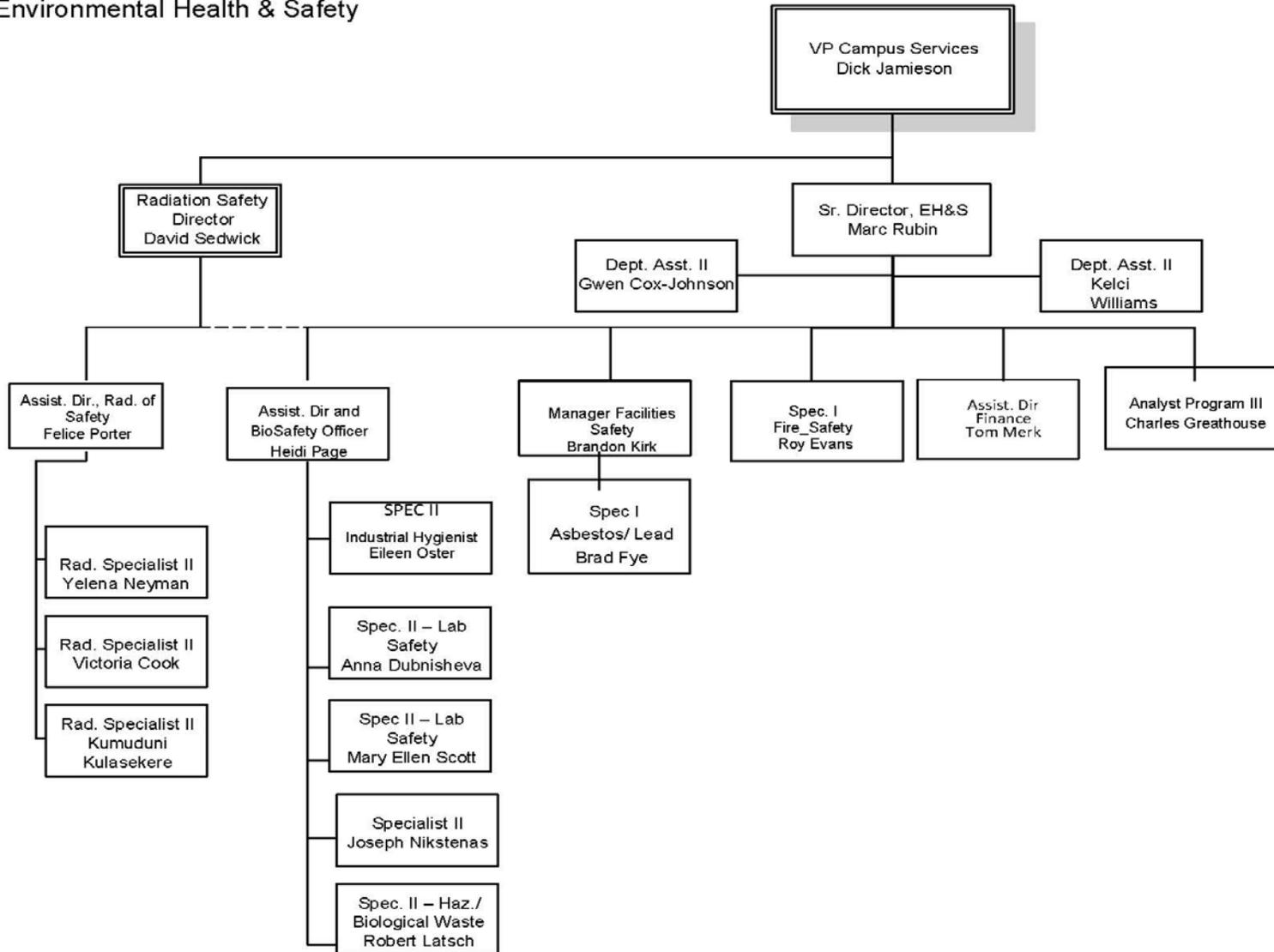
Finished floor repairs of radiation waste area

OBJECTIVES 2017-2018

EHS Objectives: Each year EHS strives to develop a portion of the many programs for which it has responsibility. The follow global objectives are set for the calendar year 2017-2018

- 1) Implement improved EPA RCRA Inspection and Training program
- 2) Collect and Implement Electronic Chemical Inventory
- 3) Improve compliance with training and safety plans on campus
- 4) Continue Hazardous Materials Review of Campus
- 5) Investigate ways to improve machine shop safety
- 6) Develop SOP/Policy Calendar to assure timely review
- 7) Develop Regulatory Calendar with electronic reminders
- 8) Decrease delinquency in retraining regarding safety plans and training across campus
- 9) Increase Employee Job Specific Training compliance in labs
- 10) Customer Satisfaction Survey

Environmental Health & Safety



DEPARTMENT DESCRIPTION

The Department of Environmental Health and Safety is charged with maintaining a safe work environment for more than 6,000 employees and 10,000 undergraduate and graduate students who work and/or live in over 100 buildings at CWRU and at 5 other major Northeastern Ohio research locations. In addition to the Ohio-based research, EHS shares safety responsibility for its personnel in locations worldwide.

EHS works to balance federal, state and local safety regulations with the requirements of research. At times, these tasks appear to conflict with each other and require innovation to achieve the needs of both a safe work environment and productive research community. EHS's customer service approach distinguishes its activities from the strict regulator approaches of yesteryear.

Dissemination of safety information is accomplished through cooperative interactions with its customers (faculty, staff and students) through, formal training, consultation, and safety document creation and maintenance, inspection and oversight activities that are encompassed in the activities of the EHS department. Audit through inspection acts as the feedback mechanism used to measure the level of compliance and the level of community understanding achieved through departmental education and consult efforts.

In a complex environment, however, accidents sometimes occur. In these cases, EHS is called upon for emergency response, mitigation of hazardous situations and forward planning where possible to avoid similar future incidents. Departmental services in and following emergencies include in house hazmat response as well as planning with external agencies for larger emergency situations. EHS works closely with internal emergency management, plant, police and security departments as well as with external agencies to generate cooperative plans and responses. Part of this effort with external agencies is directed toward familiarizing governmental regulatory and response organizations with our institutional resources and response workers. This effort provides needed groundwork for synergistic responses during emergencies.

EHS is staffed by six main sub-groups that encompass Biological, Chemical, Facilities, Fire/Life Safety, Construction, and Radiation safety concerns

Biological Safety

The Biosafety program at CWRU employs a multifaceted approach to ensure safe and responsible laboratory practices while maintaining compliance with the various Regulatory agencies to whom we are responsible. The program consists of the following areas:

Maintain compliance with NIH, OSHA, CDC, USDA, DOT, FAA, DHS and DEA regulations as they pertain to training, handling, transporting, and shipping biological materials and DEA Controlled Substances.

Work with laboratories to prepare for USDA and CDC permitting inspections

Review of Exposure Control Plans, IBC protocols and IACUC protocols for the use of biohazardous materials and to ensure proper controls and procedures are in place to protect researchers as well as the greater University community.

Educate investigators on the biological hazards in their laboratories, current Best Practices, post exposure measures and changing Regulations.

Collaborate with University Health Services to provide a robust Occupation Health Monitoring program including recommended prophylaxis and post-exposure treatments based on specific biohazards.

Provide personal consultations on best work practices, engineering controls and personal protective equipment based on specific biological hazards.

Ensure proper function of and decommissioning of the High Containment (BSL-3) Laboratories on Campus.

Maintain an up-to-date inventory of the Biohazardous Materials on the CWRU campus.

Provide specific training and work practice recommendations to the Animal Resource Center staff who will come in contact with contaminated materials.

Develop written policies on the handling of specific Biohazardous materials

Chemical safety

With over 1,500 campus locations designated as hazardous material use areas, chemical safety is by far the largest program incorporated under EHS. Areas that fall under the chemical safety program include medical research labs, chemistry and engineering labs, construction and maintenance sites and clinical areas such as dental, nursing and Health Services.

Maintains campus wide compliance with OSHA, EPA, TSCA, ODH, DOT, IATA, FAA, EAR, ITAR, DHS, DEA, DOD, NFPA, BOCA, as well as local and state agencies

Assists with APHIS, CDC, USDA, FDA and other drug and biosafety agencies

Conducts safety training for all students, faculty and staff

Conducts laboratory inspections annually

Provides on-one-on consultation with laboratories regarding safety plans

Provides environmental testing and occupational testing support

Provides facilities with air testing equipment

A review of all chemical safety protocols for the use of hazardous materials, to ensure that proper controls and procedures are in place to protect researchers as well as the greater University community

Education of campus students, faculty, and staff in the chemical and physical hazards associated with their daily routines, and the proper hazard controls used to protect themselves

Collaborates with University Health Services to provide a robust occupation health-monitoring program including recommended treatment and post-exposure treatments based on specific chemical and physical hazards

Provides consultation on best work practices, engineering controls and personal protective equipment based on specific chemical and physical hazards

Assures proper function and decommissioning of all hazardous work environments on campus

Verifies up-to-date chemical or hazard communication plans, unique to each hazardous material use area, are current. This includes inventory of hazardous chemicals and annual site-specific training and review date

Providing specific training and work practice recommendations to specific campus departments including, but not limited to, police and security, facilities, contractors, custodial and athletics

Assures compliance with all hazardous waste regulations and facilitates the removal of all hazardous waste

Provides respiratory protection training, and fit testing

Provides advice on the use of hazardous materials in laboratories and construction sites

Conducts indoor air quality and other IH assessments

Reviews upcoming legislation and provides senior management compliance advice

Works actively with local, state, and federal agencies to provide preplanning for Emergency Response

Provides limited hazmat response to small releases of materials

Provides HVAC controls testing for engineering controls such as fume hoods

Chemical Fume Hoods:

Student Assistant Pilot Program: This program has been a complete success in continuing the front line determination of the safe working conditions for one of the most important engineering controls in our laboratories. Two part-time student employees and one newly minted doctoral student have learned the behind the scenes technical aspects of fume hood testing and provided EHS with on-the floor input of employee use and status of our laboratory fume hoods. Most importantly, the needed follow-up on the repairs for the fume hoods have been tracked and retested. From the later valued input not only have several long-standing issues have come to the forefront (need for fume hood monitors, efficient and focused decreased of higher velocity fume hoods across campus and a need for better education of fume hood usage, but the pathways to improving these conditions are implemented.

Metrics on repairs are in place listing the reason for hood failures and turnaround time for repair comparing 2016 to 2017.

A new approach to safer hood use was completed by simply changing the style and message of the fume hood sash sticker, resulting in a major paradigm shift to a safer and lower sash position being used by the researchers with the added bonus of energy savings.

Assistance provided from the pilot program allowed focused attention with long standing issues in other areas of safety and the resulting collaboration with both IH and support from safety management improved conditions of formaldehyde-phenol exposures in the anatomy labs which is on-going, improved ventilation in basement of pathology, inspection related cleanup of cold room issue in biology, and cleanup of ancient storage areas in Rockefeller.

ASHRAE of new hoods is current. On-site utility program for fume hoods has streamlined data analysis and fans systems are now being added to data.

Individual items: perchloric acid hood in KHS, set for conversion and waiting for funding, located another perchloric acid hood in White, worked with Bud Morris on blocked hood ducts in Bioenterprise, worked with Erika Weilcko in retraining proper hood use in 6th floor labs of White and worked with LCS on chem fume hoods and BSC.

Repair requests for hoods that are sent directly to facilities are now being forwarded to EHS as per agreement with customer service, CSH.

Shipping Hazardous Material and Export Control

Our shipping program is expanding in the area of awareness of the need for compliance to federal regulations in proper transporting of hazardous materials and for screening materials, hazardous and nonhazardous, for export.

Improvement in tracking the shipments from the University is needed. Additional efforts in spreading the word through lab safety training has been in progress.

Retraining process could be improved by a class focused on updates and adding summaries of labeling, packaging and documentations.

Coordination with other shipping centers on campus would be beneficial in assisting researchers in procuring shipping supplies.

DOT training records and reminders could be added to our current system for automatic email reminders and certificate generation.

Reproductive Policy

Currently, the majority of notifications for assistance in this area comes from the voluntary declaration of pregnancy from employees working with radioactive materials. Consider expanding the awareness of this program to employees working with other hazardous materials, through lab safety trainings.

Review of CHP

This program has been addressed in the review of the teaching documents in biology labs and engineering labs in Rockefeller. CHPs as they are returned to EHS are also reviewed along with those for researchers whose CHPs have lapsed.

A search for a more streamlined, on-line CHP is being reviewed. On-line programs from UH are available, as well as an improved model from ACS.

An SOP template for chemical processes is in place.

An effort to move the SDS information from the computer into a practical SOP that is used at the bench is being addressed in Lab safety training.

Continue to use pre-inspection notification with summary of CHP requirements

Industrial Hygiene and indoor air quality

Annual monitoring for formaldehyde exposures to medical students and staff from the embalming fluids used in the gross anatomy labs is ongoing. An evaluation of the initial exposure monitoring from 2015 following neutralization procedures indicates a reduction of exposure levels to 40-50% from historical monitoring prior to the implementation of the neutralization procedures by medical school faculty and staff. Although the neutralization was very effective for reducing airborne formaldehyde exposures, damage to the cadaver tissue was observed in the spring and anatomy department personnel could not use the point injection neutralizations for the 2016-2017 academic year. It was reported that improved housekeeping procedures have been implemented in the four anatomy labs and limited trials of a different neutralization chemical (Infutrace), applied by spraying rather than point injections, will be undertaken. EHS will continue to conduct air monitor to determine the effectiveness of the new techniques.

There are currently no permissible exposure limits for isoflurane. Isoflurane is used in select animal surgery areas at CWRU. The ongoing monitoring of isoflurane exposures is conducted to evaluate a new process or set-up, or if conditions which have the potential to affect exposure levels is implemented. Without definitive regulatory guidance, EHS works closely with researchers to ensure that isoflurane exposures are maintained to the lowest practical level. Ventilation, veterinary equipment, and procedures are evaluated to maximize the collection of waste anesthetic gases.

Respiratory protection

EHS works closely with various departments to develop or maintain respiratory protection programs in compliance with current OSHA regulations. An understanding of the hazard, job requirements, and potential exposure is evaluated to ensure that the appropriate regulatory standard is followed. The department provides training, medical evaluations and respirator fit testing for personnel who require respirators during their work. We have also worked closely with various departments to evaluate the risks and potential exposures to employees.

The department continues to provide medical evaluations, training, and fit testing of medical students who are required to wear N95 respirators during their away rotations, typically in the third year. EHS is reviewing suggestions that the medical students receive their initial respirator training and fit testing during their 2nd year prior to their clinical core rotations. This will be evaluated with medical school staff in the near future. The need for respirators for the new PA program will need to be evaluated.

EHS continues to support the excellent respirator program in place for the Animal Resource Center personnel, including researchers using the BSL3 facilities. The department works closely with researchers and ARC staff to determine the appropriate level of respiratory protection based

on a review of potential hazards, job responsibilities, and working conditions. Use of other personal protective equipment has been evaluated by EHS and ARC staff and some modifications to donning and doffing procedures were implemented for BSL3 users last year.

Construction Safety

The construction safety program at CWRU focuses on keeping all employees safe while construction projects occur on campus. The principal responsibility of this program is to monitor construction sites and contractors to ensure compliance with state and federal regulations pertaining to health and safety standards in the workplace. This objective is achieved by using the following disciplines:

Provide regulatory support for the control of hazards on the job site that might affect the CWRU community.

Provide the removal, to the extent possible, of hazards prior to handing over job sites to contractors except as detailed in contract agreements

Provide support to the project by maintaining a visible presence in the field and to have continued availability to assist the project manager with safety related issues.

Communicate and assist the project managers to ensure all safety expectations are understood and met.

Regularly review and be familiar with all applicable legislation and standards to ensure compliance.

Provide support, direction, and resource to all project managers and contractors working at CWRU.

Organize, schedule, and perform required right-to-know safety training for all contractors prior to working on campus.

Participate in the investigation of incidents on campus to determine root cause, and to put effective actions in place to help ensure repeated incidents do not occur.

Goals achieved fiscal year 2016:

Completed overhaul of the confined space program at CWRU. Identified, marked, and implemented a procedure for approximately 300 spaces on campus

Completed a Silica written program and conducted initial contractor exposure monitoring to comply with the new OSHA Silica standard.

Worked with maintenance and contractor personnel across campus to minimize safety deficiencies on the jobsite. Visited over 125 jobs this past year.

Groups have been notified of the deficiencies in the Electrical systems across our food serving area. The electrical supervisor, an electrician, and I walked all campus food serving areas to look for electrical hazards. All areas on the quad and south side have been inspected. Fribley commons had many major violations. The electrical supervisor has called in a contractor to correct the issues. With corrections almost complete, Fribley has had over 35 GFI installed in the food area.

Hired a new fire and life safety specialist.

Goals for fiscal year 2017

PDC and Facilities have been notified of the safety deficiencies in the roofing systems across campus are currently formulating a plan to correct the problems.

Sync the contractor Right-To-Know training with access services contractor badges. This will help us identify who has been trained in a more organized fashion and will ensure the contractors that haven't been trained - get trained before they can work on campus.

Continue to complete over 150 asbestos, lead, and mold jobs per year without employee exposure.

Facilities Safety

The facilities safety program at CWRU is responsible for the health and safety of all plant and maintenance staff members. Comprised of over 80 facility and grounds members, the facility safety program must ensure those members are in compliance with local, state, and federal health and safety standards while performing their daily work tasks. This program includes:

Providing OSHA, EPA, DOT, and other training as required by law. This includes right to know, confined space entry, drivers training, lock-out tag-out, fall protection, injury prevention, and many other topics annually.

Provides lift truck and powered industrial equipment training.

Provide training in hazardous materials handling such as asbestos, lead, mold, and chemical waste.

Conducts inspection and remediation for lead, asbestos, and mold.

Conducts Job Safety Analysis of all facilities worker functions

Providing in-the-field assistance to all maintenance personnel regularly as well as when a safety concern arises.

Conducts accident and injury investigations and performs root cause analysis to prevent reoccurrence of the incident.

Provide respiratory and hearing protection training and equipment selection.

Supervises the entry of facilities personnel into confined spaces.

Reviews MSDS sheets of materials used on campus for safe application

Conducts crane inspection and foundry inspection annually to maintain compliance with the OSHA crane and hoist standard.

Goals Achieved Fiscal Year 2016

Implemented a new Safety Shoe and Eye program that was brought to maintenance employees on CWRU's campus. We will have a shoe and eye mobile set up annually so that the maintenance workers can get new shoe and eyewear each year and can easily be tracked with Grainger's software.

Job Safety Analysis has been performed by spending 1 week in each zone shop. I also collaborated with multiple meeting with the facilities leaders.

A confined space was discovered at the lower farm in the woods. I went and inspected it and determined it to be permit required. All equipment was ordered and training was provided in order to ensure compliance when working within the space.

Coordinated and oversaw the cleaning of the mercury spill in a KHS classroom conducted by Precision Environmental. Came in to meet the contractor at 5AM and was able to have the building cleared and released back to the department by 10AM.

The Machine shops on campus underwent a hazard assessment. The BWC and I walked all machine shops and conducted a mock OSHA inspection.

Goals For Fiscal Year 2017

Update the facilities HAZCOM training to reflect the changes that the EPA expects to see in the training.

The Facilities uniform safety handbook to be updated by year's end.

Update all Facilities safety programs and upload them to the EHS website.

Meet with Engineering and Risk management to discuss the physical lab/ machine shop inspections and follow-up program. Update safety programs and address with training, inspections, and recordkeeping

Fire Safety

The Fire and Life Safety Program at CWRU is tasked with the following:

Hot Work Inspections: brazing, cutting, grinding, soldering, torch applied roofing, welding, etc.)

Red Tag: anytime fire protection equipment is taken out of services for any reason a red tag permit must first be issued by the Fire and Life Safety Specialist

Fire Safety Training: All Resident Advisors go through a fire prevention safety course

Fire Extinguisher Training: Training is available free of charge for any university employee. All maintenance workers are required to attend once per year

Fire Drills: Four fire drills occur yearly for all resident halls and Greek Life houses. During the summer semester a variety of campus academic buildings will also have a fire drill

Clery Act Reporting: The Fire and Life Safety Specialist is responsible for all Clery reporting on the CWRU Campus in the fields of arson and fires that occur in resident areas. The Clery Act requires all colleges and universities that participate in federal financial aid programs to keep and disclose information about crime and safety practices on and near their respective campuses

Fire Inspections: All resident halls and Greek Life houses common areas are inspected two times per year for fire code violations by the Fire and Life Safety Specialist. All other University buildings are inspected on rotation. Any time a member from FM Global, the University insurer carrier, or a member of the Fire Department wishes to inspect a building the Fire and Life Safety Specialist will accompany them

Special Events: Any time a special event is planned on campus that requires a building to change its everyday floor layout/occupancy, when outdoor tents are being used, or hazardous materials (propane for grilling/heat, fireworks, etc.), the Fire and Life Safety Specialist is involved in the planning process

Building Emergency Plans: The Fire and Life Safety Specialist is tasked with writing, testing, and updating building specific emergency plans.

Radiation Safety

The University is authorized to use radioactive material by the State of Ohio, which became an Agreement State on August 31, 1999. Radioactive material is extensively used in the several hundred biomedical research laboratories on campus. Compliance with the complex controls and regulations governing the use of radioactivity is the primary goal of the radiation safety program. Support of research compliance and safety for faculty, staff, students, and the public is essential.

The Director of Radiation Safety is the University RSO who has a direct reporting relationship with upper University management and works under direction of the University Radiation Safety Committee as mandated by federal and state radiation Safety Agencies. At the regulation level within the University, the RSO, Assistant RSO and radiation safety staff and the radiation safety program receive authority through the Radiation Safety Committee as required for Broadscope Radiation Safety License holders for use of radioactive materials.

The Radiation Safety Office within EHS is responsible for safe use of all radioactive materials and use of radiation generating equipment. The radiation safety group maintains strict compliance within the University and among its outside vendors with all of its license conditions as approved by the State Department of Health Radioactive Materials and Radiation Generating Equipment offices.

Like the rest of EHS, the Radiation Safety office has a strong service-oriented culture that assists faculty and staff with development of safe experimental procedures, response to accidental spills and possible radiological exposures and other radiological incidents. The Radiation Safety Office also supervises purchase and tracking of all radioactive materials that enter and leave our Institution, meets programmatic requirements for personnel training, and takes care of all radioactive waste materials management. The Radiation Safety Program surveys all authorized radioactive materials user's laboratories three

times each year and perform unannounced inspections of laboratories for violations involving radioactive materials security. The program is audited throughout the year by the Radiation Safety committee for procedural compliance and once each year for general record compliance of its operations. The program is also formally audited for compliance by its own staff throughout the year and by State Regulatory Offices for compliance of both its radioactive materials and radiation generating equipment procedural compliance on a periodic basis.

Authorized use of radioactive materials is granted directly following review by the Radiation Safety Committee and RSO approval and can be suspended at any time for cause by the Radiation Safety

Committee and the Radiation Safety Office. For this reason, the Radiation Safety Office and the Authorized User community expend considerable effort to ensure that compliance issues do not interfere with the University research mission and that goals of this program can be expeditiously met

**Laboratory Safety Committee Audits
Safety Services Laboratory Programs
2016-2017**

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Assignments:

CHP/ECP	Emily Pentzer
Hoods/Biohoods	Kimberly Volarcik
Incidents	Clive Hamlin
Respirators	Gregory Tochtrop
Protocols	Kathryn Howard
Clearances	Thomas Gray
Licensing	Raul Juarez
Training	Emily Pentzer
Regulated Chemicals	Thomas Gray
Waste Program/ Waste Facility	Andrea Romani
Website	Kathryn Howard
Inspections	John Durfee
Biosafety	Clive Hamlin
IH/IAQ	Kimberly Volarcik
Shipping	Lance Vernon
Newsletter	Raul Juarez

LSC Audit Summaries and Senior Directors Response

Chemical Hygiene Plans and Exposure Control Plans

Audit: Dr. Emily Pentzer

The collection of ECP/CHP documents from the laboratories is half of the equation. The CHP/ECP plans are living documents meant to give the laboratory occupants a blueprint for safety in the laboratory. The documents are designed to be and intended to be used as teaching aids for lab specific training given by the chemical hygiene officer IE the primary investigator of the laboratory to the workers in the lab. A specific point of emphasis in 2018 is the implementation of proper lab specific training in the laboratories.

The ECP/CHP documents have been updated in 2017 and will be converted to electronic documents in 2018. This system is intended to centralize the location of all the documents and to track who reads the document and completes lab specific training. Other aids for the investigator are planned to help assist in the creation of the training and its delivery.

At present investigators are identified by inspections, department lists, and other data sources. A comparison of the labs expected to have CHP/ECP plans and those which do shows that there are a considerable number of the 411 labs requiring plans that have plans that are out of date. 135/411 plans appear to be out of date though all laboratories do have a plan in place.. The lack of updates is being addressed presently and will be addressed fully as we convert to electronic documents. Those still unwilling to update plans will be turned over to their respective Deans offices for corrective action.

A problem area with paper plans is that they get lost, remain out of date, have multiple versions, may be misplaced, or are missing sections. The implementation of the electronic form should address these fallings of paper forms.

Tolerance of out of data plans and incomplete lab specific training is an exposure to the university. Laboratories that do not comply are risking the university reputation, monetary fines, and possible legal action in the event of an accident, and bodily injury to improperly trained workers. As such, a decided push on these documents as well as training is in process.

Chemical, Laminar, and BioHood Testing Programs

Audit: Kimberly Volarcik and Colleen Karlo

The testing of fumehoods is conducted internally by EHS while the testing of Biosafety devices is conducted by a third party vendor. Records of all testing is maintained by EHS.

The SOP was updated in 2017. An audit of the testing and results was conducted for 15 random hoods. All records were found to have proper documentation.

A detailed document of all fumehood testing is created each year along with performance data for each building. This document is jointly published with Facilities along with the plan of action to address deficiency with regards to chemical fumehoods. A decided feature of the report is the ability to detect shifts in building system performance by graphing the last 5-10 years worth of data. This allows the detection of building HVAC systems with drifts in performance as well as areas where meter calibration and offsets have drifted.

A third party conducts the biohood testing program. The results of the testing are given to EHS. Because of the use of a third party, the third party conducts repairs. Hoods are taken out of service until they can meet certification.

Incident Reports

Audit: Dr. Clive Hamlin

The Incident report database is a catalog of all actions taken to address specific issues that arise on campus. Each cataloged action is to be a full description of the problem, the actions taken, and the resolution of the issue.

2016-2017 had a lower number of incidents than in years. The reason behind this drop is unclear. Typical years past ranged from 130-170 incidents. Only 64 were recorded in 2016-2017. This also corresponds with the new change in Police Security leadership and may reflect the increased ability of Police Security to address specific events on their own such as natural gas odor calls.

The Sop was found to be out of date from 2009 and should be reviewed and updated in 2018.

Respiratory Protection Program

Audit: Dr. Gregory Tochtrop

The respiratory protection program covers EHS and other emergency workers, Facilities, Police and Security, Custodial, Grounds, and lab workers as well as medical school students.

Presently there are 136 persons in the program. 129 of the 136 users of the program are N95 users. The remaining group consists of EHS workers and ARC workers.

No issues were noted during the audit. It should be noted that this program was cut in half last year with the stand down of the pandemic flu N95 preparations from 2009.

EHS Chemical and Biological Safety Program: IBC/IACUC

Audit: Kathryn Howard

EHS reviews protocols for the IACUC and IBC. Efforts to streamline the process have been underway and are now in place. No issues were noted during the audit.

Clearance Program

Audit :Dr. Thomas Gray

The clearance program is designed to organize the safety release of objects and rooms prior to disposal or for work. 538 clearances were conducted in the 2016-2017 period. No issues were noted.

Hazardous Waste Facilities

Audit: Dr. Andrea Romani

The hazardous waste facilities are EPA RCRA regulated spaces used for the collection and staging of hazardous waste prior to removal for eventual disposal at an EPA approved TSDF facility.

All facilities were also recently inspected by Ohio EPA and found to be in good shape. Deficiency in the amount and type of emergency equipment was noted. This has been corrected. Deficiency in the required Emergency Response plan for the facilities was noted. A single plan existed since 1989. The plans have since been updated and separated by facility. Ohio EPA reviewed and approved the existing plans. The plans were shared with CWRU Police, UH Safety/Police, Cleveland Fire, Cleveland Police, and the NEORS.

No issues noted.

Regulated Chemicals

Audit: Dr. Thomas Gray

The regulated chemicals program is a sub program of the OSHA laboratory standard and requires the evaluation of the use and exposure to a list of chemicals known as regulated chemicals.

A yearly questionnaire is sent out to the laboratories asking if they work with regulated chemicals and the manner of control used to prevent exposure. If the work is always in a fumehood the risk of exposure above the OSHA action level is very minimal and formal air sampling and evaluation is generally not required. This may of course not be true if the volumes are large. On the other hand if use is on the bench or sometimes outside of a fumehood, those types of use should be evaluated. EHS has a program in place to look at high risk operations and perform air monitoring. This is generally conducted by the EHS industrial hygienist or a third party contractor. By far the largest regulated chemical use on campus is confined to the use of formaldehyde. EHS efforts have been focused on this use. Moving on to other regulated chemicals, ethylene oxide use was evaluated for the single group on campus using it and a full program assembled. Further evaluations are on going.

Dr. Gray evaluated the program on November 2, 2017. At the time, the program was in flux due to the departure of the EHS industrial hygienist. With the benefit of hindsight, the program is in the process of reboot at this time for chemicals other than formaldehyde. Formaldehyde monitoring is continuing and ongoing.

Website

Audit: Kathryn Howard

The EHS website had a major overhaul by the CWRU Marketing and Communication group as it was migrated to T4. In the process, every page was rewritten and every training was updated. While great changes were made, the sky is the limit in terms of improvements.

One of the largest efforts in the history of EHS is the attempt at putting all safety documents on line so an investigator has a permanent place to assemble and store documents as well as to communicate with staff and EHS and document the results. Further, electronic chemical inventories are in the process of being collected and will be put up for the labs to utilize on a daily basis. This will also tie in to the SDS sheet program and collect emergency contact information. The ability to print forms, signs, labels will be made available along with other services such as ordering hood service, looking up training, and having the ability for the investigator to get a dashboard regarding their compliance status and inspections.

EHS Lab Safety Inspection Program

Audit: Dr. William Durfee

The EHS lab inspection program has been going strong for over twenty years. The number of spaces inspected can exceed 6000 individual rooms and 4-5 people conduct the work. Thus over 1000 spaces are inspected annually per inspector. Inspections to date have been done by building and the results sent to the investigator only unless elevation of a serious issue is required. This process has compartmentalized the inspections. Further, inspections have been performed from a set of questions blending areas of inspection rather than looking at them in the microcosm. The points of emphasis in thinking one discipline may be remarkably different from another discipline. Therefore, it is import to look through the regulatory eyes of the issue being evaluated rather than taking a general view. For example finding a container with an open top may not rise to the level of a serious violation in the general view. If you view this open container from an EPA standpoint, this is a serious violation of EPA RCRA. If the container contained a solution of nickel sulfate, it would not be an OSHA hazard or a fire hazard so it might be viewed as a non-issue but if looked at from an EPA regulatory view it is an unsecured open bottle of hazardous waste and a 25,000.00 per occurrence event. Without proper perspective, inspections may not pick up the subtle points of emphasis.

To remedy this, inspections are now conducted in sections rather than as a single inspection checklist. This helps to focus the points of emphasis as needed. Further, to reduce compartmentalization of the inspection process, EHS is working from a base set of assigned rooms and inspecting by department. The final inspections will then be tabulated and supplied to both the investigator and the department chair. A summary of the common types of issues found will be generated. Once the departments in a school are completed, the sub reports will be put together to form a by school report that will be sent to the deans of the various schools. This will offer suggestions regarding points of need such as a lack of equipment or space, the general types of hazards found, areas where excessive chemical waste were found that might require high costs to address and other such items useful to the school for planning and understanding the safety conditions of their laboratories. This will also include a list of the labs and personnel that require updates to training and plans. By raising the awareness and the conditions in the labs throughout the organization, more attention to the issues will be taken.

All of these efforts should result in increases awareness, documentation, and deeper regulatory inspection.

Biosafety Program

Audit: Dr. Clive Hamlin

The advancement of biosafety in recent years and in the future to come is experiencing exponential growth. The types of procedures and ability to manipulate biological systems is expanding rapidly. Therefore, the need to stay on top the curve of advancements is crucial. Biosafety needs are becoming more complex. Therefore, the level of diligence needed is also growing. To this end, the EHS biosafety officer has been reviewing all ECP plans and offering suggestions to improve the plans. As the program has expanded, so has the number of personnel that have not keep up with their training obligations. This is also true of the investigators with respect to ECP plans. As was stated with the CHP, an effort is being made to focus on bring these personnel and plans back into compliance. A point of emphasis with the inspections this year is lab specific training. This in concert with upward reporting to the chairs and deans should help to remedy the situation.

There are 215 workers not including PIs that are more than 60 days past due for training.

There are 78 PIs more than 60 days past due for training. 48 of these have active biosafety programs.

Industrial Hygiene

Audit: Kimberly Volarcik

2016 saw the departure of the EHS Industrial Hygienist. This position is not being replaced but instead will utilize third party contractors to conduct sampling and evaluations that would normally use an industrial hygienist. Most IH issues do not require the full level of expertise an IH brings to the table. When such situations occur a contractor is employed. EHS would like to add this function back to the department at some point but the decision to increase the number of line personnel working in the inspection and training program was of first import. Fortunately, we were able to hire in a toxicologist and already have on staff several well trained personnel who can conduct and oversee basic IH situations such as regulated chemicals evaluation.

DOT Import Export Hazardous Materials Shipping

Audit: Dr. Lance Vernon

No issues noted. The program is strong and continues in cooperation with the CWRU Compliance office to regulate the import and export of regulated materials as well as the shipping of materials from the campus.

Training

Auditor: Dr. Emily Pentzer

Training and Inspection are the two largest parts of the ERHS lab program.

The training programs of EHS are designed to offer the first line of education with regards to regulatory required safety training. The second and arguably most important level of training is lab specific training supplied by the investigator to the lab workers. This instruction covers the actual work to be accomplished and the safety procedures required.

EHS offers approximately 30 individual courses. The major courses are lab standard, biosafety, hazard communication, radiation safety, and shipping.

Each of the courses are annually or more frequently reviewed. This past year saw the review of all programs due to the migration of the programs from Blackboard to Canvas.

Retraining programs have been reorganized to reflect that they are a refresher and not primary training. Therefore, various deeper points of emphasis or issues commonly found during inspection are being incorporated into retraining.

The training database accumulated a large number of records of personnel that over the years had training obligations but who changed positions or left the university. As a result of the 12,000 training records held, nearly 50% were purged from the system. This greatly increased the apparent level of compliance with training and has allowed a more realistic view in capturing the actual group of workers delinquent in training. 2018 is the year of clean up and catch up to bring the delinquent trainings above 95% compliance or better.

The total number of trainings conducted by EHS is 8,271 of this 3,013 were conducted online thus 5,258 in person trainings were conducted. An average of two training classes per employee are required. Thus, about 4,360 individuals were trained in 2016-2017.

Laboratory Safety Committee Audits 2016-2017

5/31/2017

To All,

Please find below the areas of audit that have been assigned this year and the person that will conduct the audit. Please complete the audit during the month in which they are assigned and return the audit to Clive Hamlin with a copy to me for EHS follow up. I have attached the LSC Guidelines that list and explain each audit. I have also listed the EHS contact for the audit as well.

2016-2017 Laboratory Safety Committee Audit Assignments

Month	Audit Area ✓	Auditor	EHS Contact	Done
1 Jun 2017	CHP/ ECP ✓	Emily Pentzer	Felice Porter	
2 Jun 2017	Hoods/ Biohoods ✓	Kimberly Volarcik	Mary Ellen Scott/ Kelci Williams	
3 Jun 2017	Incidents ✓	Clive Hamlin	Tom Merk	
4 Jun 2017	Respirators ✓	Gregory Tochtrop	Heidi Page/ Brandon Kirk	
5 Jun 2017	Protocols ✓	Kathy Howard	Heidi Page	
6 Jun 2017	Clearances ✓	Thomas Gray	Heidi Page	
7 Jun 2017	Waste Facilities ✓	Andrea Romani	Robert Latsch	
8 Jun 2017	Licensing ✓	Raul Juarez	Marc Rubin	
9 Jun 2017	Training ✓	Emily Pentzer	Tom Merk	
10 Jun 2017	Regulated Chemicals ✓	Thomas Gray	Heidi Page	
11 Jun 2017	Waste Program ✓	Andrea Romani	Robert Latsch	
12 Jun 2017	Website ✓	Kathy Howard	Charles Greathouse	
13 Jun 2017	Inspections ✓	John Durfee	Heidi Page	
14 Jun 2017	Biosafety Program ✓	Clive Hamlin	Heidi Page	
15 Jun 2017	Industrial Hygiene/ IAQ ✓	Kimberly Volarcik	Heidi Page/ Brandon Kirk	
16 Jun 2017	Haz Material Shipping ✓	Lance Vernon	Mary Ellen Scott	
17 Jun 2017	Newsletter	Raul Juarez	Tom Merk	

Thanks,
Felice

Laboratory Safety Committee
Audit of
Chemical Hygiene Plan and Exposure Control Plan
July 1, 2016 to June 30, 2017

Audited by: Emily Pentzer for the purpose of maintenance of the EHS Chemical/Biological Program

Comments:

CHP and ECP practices for laboratories at CWRU were reviewed. There are a surprising number of out of date CHP and ECP documents (135 labs of 411 are non-compliant, this is 32%). Poor identification of labs which no longer need CHP and ECPs may lead to inflated number of non-compliant labs. EHS may also consider including an intermediate on requests for updated/compliance of CHPs and ECPs, for example department chairs, dean of school, or office of research. EHS may also consider penalties for past due documents- for example if ECP and CHP are 6 months past due the lab cannot order, or submit grants. There is also considerable waste in using paper. Online submission forms may help (especially for signatures or updated training-perhaps through googledocs or another cloud-based service).

-
- **What is the administrative mechanism for informing the PIs that they need to submit a CHP and/or ECP?**

Reminders are sent to delinquent labs every 6 months from Felice directly to the PI, and upon inspection if deficiencies exist. If a volunteer or minor begins working in the lab, Felice ensures the lab is compliant, and if it is not, then she requests compliance. All communication is directly from EHS to the PI of the lab.

- **Review of CHP/ECP forms; are the forms current?**

The forms are current.

- **What measures are there to ensure that some PIs are not being missed?**

The first step is self reporting by the PI. New faculty members are identified upon hiring and HR provides information from EHS. Inspection of buildings also results in newly identified labs and spaces that require ECP and CHP.

- **What is the mechanism for identifying PIs that need a CHP and/or ECP?**

The PIs are asked if they have a laboratory or are doing research; they must either provide their own documents if serving as their own PI, or if they are working under another researcher, the documents of that researcher must include their name and training information. Laboratories

using chemicals, biologicals, radioactive material, X-ray equipment are required to the CHP and ECPs; at times such information can come from purchasing.

- **What are the instances when there are laboratories not previously identified with CHP/ECP that begin experimental work and now need a CHP or ECP?**

Purchasing helps identify PIs acquiring radioactive materials, biochemicals, and gas cylinders. While chemicals are not as heavily regulated, regular building inspections help identify PIs and spaces that require CHP and ECP.

- **Is the Standard Operating Procedure current?**

Yes, the SOP for the CHP and ECP are current, and were revised/reviewed June 2017; the ECP and CHP templates are available online as a fillable .pdf file.

- **Is the researchers' signature on the CHP and ECP?**

Felice ensures signatures are present before sending the documents to Mary Ellen and Heidi for further inspection.

- **Ensure that the date is current.**

Felice ensure that the date is current.

- **Review laboratory inspections; was the CHP and ECP checked for currency?**

The laboratory inspection form includes comments on the current state of CHP and ECP documents. Inspection forms are printed and paper copies added to the PIs file.

- **Were infractions corrected?**

Heidi reviews inspections and contacts the PI directly if infractions are identified.

- **Review 10 plans to see if safety is adequate.**

10 CHP and ECP submitted plans were reviewed. PIs do not always submit both documents, and frequently do not provide all required information, such as signatures. PIs also submit signed originals, and it is unclear if they retain a copy for themselves.

- **What is the mechanism used to track those that have submitted the CHP or ECP?**

Upon submission, CHP and ECP come to Felice who ensures completeness. Then, CHP is sent to Mary Ellen for review and ECP is sent to Heidi for review. After reviews are completed, the

documents are sent to file (Kelsey), and Felice notifies PI of any deficiencies, and Mary Ellen and Heidi ask for specific issues related to the documents.

- **How many researchers (PIs) have laboratories?**

Currently there are 411 active research laboratories.

- **How many delinquent CHPs/ECPs?**

Currently, 276 laboratories are compliant. The rest are past due. Within one year of past due, Marc Rubin follows up directly; if required, Marc will contact department chair and dean of the college.

Laboratory Safety Committee
Audit of
Chemical, Laminar, Bio Hoods

This file was audited by Kim Volarcik and Colleen Karlo, members of the CWRU Laboratory Safety Committee, for the purpose of maintenance of the EHS Chemical/Biological Program.

Comments: The student program has allowed EHS staff to provide a detailed report focusing on the needs on campus in regards to fume hood safety. This report details fume hood inspections by building and floor, showing trends which can be used by facilities to address needed repairs. There has been an increase in the number of work orders for airflow monitors over the last year due to failure or lack of a monitor. There is concern specifically within Kent Hale Smith, which has shown an increase in the number of fume hoods which have failed or have restricted use over the last 3 years. It is recognized that funding is a limiting factor in addressing some of the issues. Overall, the fume hoods are being inspected on an annual basis, and the documentation of the testing is organized and detailed within the EHS software.

Recent Changes: EHS is receiving better support from facilities in an effort to maintain fume hoods on campus. They have also updated the SOP on hood testing, in an effort to save energy while maintaining safety (testing with sash at 18"). EHS has added an indicator located on the side of the fume hood to provide a visual aid for investigators for proper sash height during use.

Planned Updates: _____

Considerations for Possible Program Improvement: _____

Audits to Form: _____

Signature: Kim Volarcik Date 7-31-17
Colleen Karlo 7/31/17

- ❖ For each type of hood, is the Standard Operating Procedure current?
 - o All SOP's for chemical hoods, biosafety cabinets, and testing of fume hoods were updated in June 2017 and have been signed.
- ❖ Review request forms for certification & repairs of chemical, laminar, and biological hoods. Are request forms current?
 - o Request forms can be accessed from the EHS website for issues regarding fume hoods, and for certification or repair of biological hoods.
- ❖ For each type of hood, check 15 files, can EHS provide records that document the most recent inspection as well as the "trail" of annual inspections?
 - o Software used by EHS contains a list of all fume hoods on campus, and for each hood, details from the last inspection can be found (including notes

regarding the testing), as well as a log of inspections conducted over the years.

- o Biosafety cabinets are inspected by an outside company (Laboratory Certification Services, Inc), and EHS reviews the requests for certification and repair, and the reports that are given by LSC.
- ❖ Can Safety Services provide a list of those hoods that failed inspection?
 - o The 2016 Chemical Fume Hood report, gives details of the fume hoods that have failed inspection.
- ❖ Who is responsible, and on what frequency, for evaluating the progress of hood repair ordered from plant services?
 - o Mary Ellen Scott is able to view work orders that have been submitted to facilities, and these are checked at least monthly, and there is direct communication between facilities and EHS.
- ❖ Is the equipment calibration date current?
 - o All monitoring equipment has been recently calibrated.

Audit of Incident Reports

1. Standard Operating Procedure is dated 2007 and last reviewed 2009. Also, online copy is not signed. Operating Procedure is essentially current, but minor changes are needed and procedures should be reviewed yearly with documentation.
2. Number of incidents during the 2016 – 2017 year: 64 incidents. This is lower than the past several years with recording of 130 – 170 incidents yearly. Either 2016 – 2017 was a good year, or incidents were not recorded accurately.
3. Classification of Incidents: incidents are classified under 16 sub-headings. Most incidents fell into the following three types, odors (29), waste disposal (10) and spills/leaks (8).
4. Appropriateness of remedial action? Is there resolution documented for each incident? Is there a systematic review of outstanding cases by EHS? Each of these requires reading through each incident before the questions can be answered. There should be a field, or fields, enabling documentation of each incident resolution, and by whom.
5. Adequate (hardcopy) documentation maintained in a central file? I recommend phasing out paper in favor of a complete and accurate electronic file.

Clive Hamlin, July 11, 2017

Respirators:

The Respiratory Protection Program operates under the stated purpose of ensuring protection of all employees from respiratory hazards through the proper use of respirators. The program is guided by a manual written in 1990, updated in 2006, which is currently undergoing its second revision, anticipated to be completed within the 2017 calendar year. The analysis of the current and revision-in-progress manual revealed no deficiencies. The manual clearly and accurately referred to the OSHA laboratory standard for guidance. All easily anticipated situations germane to respirator use were addressed in the manual(s).

During the period of 9/2016–8/2017 136 total people were trained under the program from a broad group of individuals across campus units including: 1) medical/dental students; 2) CWRU EMS; 3) Animal Resources; 4) Infectious Diseases; 5) Pulmonology; 6) Gastroenterology; and 7) EHS. Of the 136, 129 were trained for N95 respiratory use, three for the use of full/half face cartridge respirators, three for powered air respirators, and one for a mold-specific respirator.

No issues to address were noted during the audit.



COLLEGE OF
ARTS AND SCIENCES
CASE WESTERN RESERVE
UNIVERSITY

June 23, 2017

Kathryn Howard
Facilities Manager
Facilities Manager
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RE: LSC Audits: IBC and IACUC

To members of the University Safety Committee,

On June 22, I met with Heidi Page to Audit EHS Chemical/Biological Program to IBC and IACUC protocols at CWRU. The protocols are accessible electronically to EHS personnel. The protocols are current and are signed electronically by EHS. The program is a strong collaborative effort between EHS and the IBC and IACUC.

Enforcement for the IBC protocols is strictly before work begins. IACUC protocols have post approval monitoring. The program seems to be working well with no issues reported.

In the past year, EHS has streamlined the hazard identification aspect of the protocols to improve consistency.

On a final note, the audit questionnaire should be updated to accurately reflect the EHS role in the safety aspects of the IBC and the IACUC.

Sincerely,

Kathryn Howard

Laboratory Safety Committee
Audit of
Clearances

This file was audited by THOMAS GRAY, a member of the CWRU Laboratory Safety Committee, for the purpose of maintenance of the EHS Chemical/Biological Program.

Comments: 538 CLEARANCES THIS PAST YEAR

Signature: Thomas M. Gray Date September 27, 2017

- ❖ Is the Standard Operating Procedure current? YES
- ❖ Number of clearances addressed this year. 538
- ❖ Was completion timely? YES
- ❖ Were clearances filed correctly?
- ❖ Classification of clearances
- ❖ Is there closure in each clearance?
- ❖ Is the equipment calibration date current?
- ❖ Are clearances reviewed on a 3 month basis to identify if clearance is still open?
- ❖ Are clearances reviewed on a 3 month basis to identify if clearance is closed but paperwork has not been closed out?

Laboratory Safety Committee
Audit of
Chemical/Biological Safety Laboratory & Waste Facilities (Morley, Millis, Wolstein & DOA)

This file was audited by Andrea Romani, a member of the CWRU Laboratory Safety Committee, for the purpose of maintenance of the EHS Chemical/Biological Program.

Comments: Facilities inspected. In good standing order
Drums waiting for appropriate disposal carry
labeling in accordance to material contained
Benches & aisles are clean and free of obstruction
All equipment current & calibrated

Signature: Andrea Romani Date 9/22/2017

- ❖ Is the Standard Operating Procedure current?
- ❖ Inspect the laboratory and both facilities.
- ❖ Document problems or concerns.
- ❖ Aisles clear, Bench Clear
- ❖ Are waste containers overflowing or is waste lying around?
- ❖ Are the waste areas, office, laboratory, and bathroom respectably clean (swept, mopped)?
- ❖ Is waste disposed in a timely manner (with 90 days)?
- ❖ Are drum records maintained?
- ❖ Are the weekly barrel checks logged?
- ❖ Verify that all equipment is current in calibration.
- ❖ Verify that equipment that is not currently in use has an "Out of Service" label.

Memorandum

To: Marc Rubin

From: Thomas Gray

Date: November 2, 2017

Subject: Audits of the Regulated Chemicals Program

This is to acknowledge that on November 2, 2017, I audited the Regulated Chemicals Program.

Laboratory Safety Committee

Audit of

Regulated Chemicals

This file was audited by Thomas Gray (x0991), a member of the CWRU Laboratory Safety Committee, for the purpose of maintenance of the EHS Chemical/Biological Safety Program.

Comments: A formal regulated chemicals program is being devised that incorporates all chemicals subject to OSHA regulation. Questionnaires concerning

- Who will be using the chemical
- Where they will use it
- How much they will use, and
- How they will use it

will be embedded in the Chemical Hygiene Plans, to be updated annually by the PI. The final plan will include summaries with charts, and is expected by the end of 2017.



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June 23, 2017

RE: LSC Audits: Website

To members of the University Safety Committee,

On June 22, I met with Charles Greathouse to review the EHS website. The redesign of the website was completed a few months ago and the newly renovated site launched a few months ago. The new site is easy to navigate, brand compliant and a vast improvement over previous renditions. The thoughtful design should be commended and will translate into easier access to critical safety oriented information for our CWRU community.

The testing and training portion is easy to access through the site. The training is currently on Blackboard and will be moving to Canvas sometime soon. I appreciated the new dashboard on the training site, the downloadable notes, and the lack of a time limit on the exams. The tweaks to the programming that will require that viewers actually pay attention to the slides are a stroke of genius. The link to check your training is not working currently; however, the problem should be resolved shortly.

The care that was put into the lab signs portion of the new site is evident. Every effort has been made to make the process user friendly and accurate. There are notifications built into the system to EHS when Radiation or Laser use is requested on a sign.

Overall, my impression is that the new website will be an asset towards an improved safety culture on our campus. I, particularly, appreciated the anonymous violation notification mechanism that is built into the front page.

Sincerely,

Kathryn Howard

Marc Rubin

From: Heidi Page
Sent: Tuesday, October 31, 2017 10:08 AM
To: Marc Rubin
Subject: Fwd: Inspection audit

Heidi Garson Page, MS, RBP

Assistant Director, Safety Services
Biological Safety Officer
Environmental Health & Safety
Case Western Reserve University

216.368.5864
heidi.page@case.edu

----- Forwarded message -----

From: Heidi Page <hep14@case.edu>
Date: Tue, Oct 24, 2017 at 2:40 PM
Subject: Inspection audit
To: Felice S Thornton-Porter <felice.porter@case.edu>
Cc: John Durfee <jwd7@case.edu>

Hi Felice,
Here is Dr. Durfee's response to the audit:

The CWRU EHS inspection program:

SOP was updated in 2016.
Planned update of inspection checklist and database
Most common issues found during inspections: lack of available and updated safety documentation and hazardous chemical waste storage and disposal
All labs were inspected in 2016 and the EHS staff are on track to inspect all labs in 2017
Inspection team is fully staffed with 2 people in training

Suggestions:

Should have a searchable database to search problem areas and identify trends

Heidi Garson Page, MS, RBP

Assistant Director, Safety Services
Biological Safety Officer
Environmental Health & Safety
Case Western Reserve University

216.368.5864
heidi.page@case.edu

Attachment C: Sample Memorandum

Memorandum

To: Chair of the Laboratory Safety Committee
From: Andrea Rouani
Date: 9/22/2017
Subject: Audits of the Chemical and Biological Safety Program

This is to acknowledge that on the above date, I audited the following aspect of the Chemical and Biological Safety Program (circle appropriate category), and the following files (where applicable).

Category (Circle one)	Audited Files (List names or dates)
Chemical Hygiene Plan & Exposure Control Plan	_____
Chemical, Laminar, Bio Hood Regulated Chemicals (Formaldehyde, Benzene, Methylene Chloride, Vinyl Chloride)	_____
Hazardous Chemical Waste Program	_____
Incident Reports	_____
Bloodborne Pathogens Program	_____
Clearances Program	_____
Industrial Hygiene/ Indoor Air Quality Program	_____
Training Program	_____
Respirator Program	_____
Website Accuracy	_____
Inspections	_____
Research Protocols	_____
Infectious Material Shipment & DOT Shipment	_____
Select Agent Program	_____
Chemical/Biological laboratory & DOA, Wolstein & Morley Waste Facility Licensing Status	<u>Andrea Rouani; Robert Latch 9/22/2017</u>

Biosafety Pathogen Program Audit

I performed the audit June 21, 2017 with Heidi Page.

The program is well run with one defect. The Standard Operating Procedure needs to be updated.

Number of personnel delinquent for retraining: There are 215 workers, not including PIs, dental, or medical students, but including non-PI faculty, custodial, contractors, undergraduate and graduate students, temps, and volunteers who are more than 60 days overdue on BBP training. Of those 168 are in active labs (excluding sharps), 5 are in sharps labs, 18 are in special cases (exempt, inactive, pending/undetermined), and 24 are in labs without bio permits.

Number of PI's delinquent for retraining: The number of PIs who are 60 or more days overdue on their BBP training is 78. Of those, 47 have active bio permits, one of which is a sharps permit. (24 do not have a bio permit and 7 are inactive.)

Laboratory Safety Committee
Audit of
Industrial Hygiene & Indoor Air Quality Program

This file was audited by Kim Volarcik and Colleen Karlo, members of the CWRU Laboratory Safety Committee, for the purpose of maintenance of the EHS Chemical/Biological Program.

Comments: The program manager left Case Western Reserve University last year and the position still has not been filled. Therefore, there is no one who can accurately account for IAQ/IH issues during the 2016-2017 fiscal year.

Recent Changes: No one in the role of the Industrial Hygienist on EHS staff

Planned Updates: _____

Considerations for Possible Program Improvement: We would recommend that EHS either post a position for an Industrial Hygiene Program Manager or look within the personnel of the department and find a person or persons who could share the role to cover the roles and responsibilities of the Industrial Hygiene & Indoor Air Quality Program.

Audits to Form: _____

Signature: *Kim Volarcik* Date: 7.31.17
Colleen Karlo 7/31/17

- ❖ Is the Standard Operating Procedure current?
- ❖ Number of industrial hygiene exposures addressed this year.
- ❖ Equipment calibration date current?
- ❖ Number of individual assessments made within the year.
- ❖ Number of outside contracts that were issued for air assessments.
- ❖ Number of environmental sampling exposures addressed this year.
- ❖ Was sampling done for each exposure?
- ❖ Were the results within compliance?
- ❖ Were assessments sent to each employee informing them of the results?
- ❖ Number of asbestos exposures addressed this year.
- ❖ Was sampling done for each exposure?
- ❖ Were the results within compliance?
- ❖ Were assessments sent to each employee informing them of the results?
- ❖ Number of bioaerosol exposures addressed this year.
- ❖ Was sampling done for each exposure?
- ❖ Were the results within compliance?
- ❖ Were assessments sent to each employee informing them of the results?
- ❖ Number of lead exposures addressed this year.
- ❖ Was sampling done for each exposure?
- ❖ Were the results within compliance?
- ❖ Were assessments sent to each employee informing them of the results?
- ❖ Number of indoor air quality concerns addressed this year?
- ❖ Was the Indoor Air Quality questionnaire completed for each indoor air evaluation?

✓ PR 9/5/2017 L6

Laboratory Safety Committee

Audit of
Hazardous Material, DOT & International Shipment

This file was audited by Lane T. Vernon, DMD, a member of the CWRU Laboratory Safety Committee, for the purpose of maintenance of the EHS Chemical/Biological Program.

Comments: looks good!

Recent Changes: not called for.

Planned Updates: Constantly updated teaching: FAA & Ground Regulations, etc (SOP)

Considerations for Possible Program Improvement: Could log when FedEx verifies person's eligibility (track #, volume)

Audits to Form: Form is adequate.

Signature: [Signature] Date 1 Sept 2017

- ❖ Is the Standard Operating Procedure current?
- ❖ Review in-class DOT training & tests. Is in-class training & test current?
- ❖ Review online DOT training & tests. Is online training & test current?
- ❖ Number of manifests. If there are more than 15 chemical and/or biological manifests, review 15 of these records.
- ❖ What problems are there currently?
- ❖ How many were advised on shipment of materials? Was there proper facilitation of shipment of materials this year?
- ❖ How many were trained on shipment of materials?
- ❖ Were there reported incidents with shipments? If so, what action was taken to correct or remediate?
- ❖ For shipments to a country other than the United States, was the content of the shipment vetted for export licensing requirements and the recipient vetted against the restricted party lists?
- ❖ Was shipment done by persons with proper training?
- ❖ Have there been any reviews/audits by outside agencies? If so, were there any findings and what steps were taken to remediate and prevent recurrence?

Laboratory Safety Committee

Audit of

Training Program

July 1, 2016 – June 30, 2017

Audited by: Emily Pentzer for the purpose of maintenance of the training program

Comments:

EHS is responsible for training researchers and students across campus, and this training meets, if not exceeds requirements from federal and state statutes. All training protocols are up to date. Complete compliance for personnel training (i.e., non-lapsed training) could benefit from support of administration, especially researchers who ignore requests for updates to lapsed trainings

1. Is the Standard Operating Procedure Current?

The standard operating procedure for trainings come directly from the written governmental regulations; for example, OSHA standards are used if available, or relevant code of federal regulation (CFRs). The procedures are available at the respective government website and are updated there.

2. Status of training in each area (right-to-know, regulated chemicals, blood-borne pathogen, material shipment, formaldehyde).

For right-to-know (called “Hazards Communication” at CWRU), regulated chemicals, blood-borne pathogens, and materials shipment, each employee is initially trained in person. Thereafter, persons re-train annually online, provided that they are within thirty days of the anniversary of their last training. Formaldehyde training is incorporated into regulated chemicals training, as part of training in the OSHA laboratory standard. A current standard operating procedure was on file.

- Blood-borne pathogen training is renewed annually (a CWRU requirement)
- OSHA Lab Standard training is renewed annually (a CWRU requirement)

- Respirator training, with physical and fit-test, are renewed annually, by law.
- DOT and IATA training are renewed every 2 years (a CWRU requirement)
- The animal resource center handles BSL3 and ABSL3 training

3. Status of retraining in each area.

Retraining occurs on an annual basis, and is done online within thirty days of the one-year anniversary of the most recent training. Past thirty days, retraining is completed in person.

4. Enforcement of Training Requirements.

Past-due warnings are sent for retraining by an automatically generated e-mail after the expiration of their training date (i.e., one year anniversary of their last training). Delinquency past this point is dealt with on a case-by-case manner; the PI is notified by Kelci of any workers in their lab that are over 30 days past expiration. Ultimately, the issue of past due training can be brought to the chair of respective department. For past due radiation safety, license can be pulled.

5. Number of employees trained per year.

From July 1, 2016 to June 30, 2017, a total of 8,271 Total. Of these trainings, there were 2,867 Lab Safety, 1,214 Hazards Communication, 123 Formaldehyde, 2,419 Biosafety with Bloodborne Pathogens, 423 Respirator, 173 Vehicle Safety, 356 Fire Safety, 504 Plant and Maintenance Training, 66 DOT/IATA, 61 Contractor Training, 13 Scissor and Fork Lift, and 52 ARC Training.

6. Number of employees trained in person this year.

5,258 Total, 1807 Lab Safety, 591 Hazards Communication, 0 Formaldehyde, 1393 Biosafety with Bloodborne Pathogens, 287 Respirator, 173 Vehicle Safety, 356 Fire Safety, 504 Plant and Maintenance Training, 66 DOT/IATA, 61 Contractor Training, 13 Scissor and Fork Lift, and 7 ARC Training.

7. Number of online training this year.

3,013 Total, 1060 Lab Safety, 623 Hazards Communication, 123 Formaldehyde, 1,026 Biosafety with Bloodborne Pathogens, 136 Respirator, 0 Vehicle Safety, 0 Fire Safety, 0 Plant and Maintenance Training, 0 DOT/IATA, 0 Contractor Training, 0 Scissor and Fork Lift, and 45 ARC.

8. Number of delinquent in each training area?

For this time period, the number delinquent trainings are: 1,379 in total. Of these, there are 480 Lab Safety, 316 Hazards Communication, 0 Formaldehyde, 554 Biosafety with Bloodborne Pathogens, 1 Respirator, 0 Vehicle Safety, 0 Fire Safety, 0 Plant and Maintenance Training, 21 DOT/IATA, 0 Contractor Training, 0 Scissor and Fork Lift, and 7 ARC Training.

9. Has enforcement policy been used?

Reminder emails have been issued to advise personnel of expired training, but no one has been removed from service because of persistent delinquency. The PI is contacted first, followed by the chair of the PI's department. Ultimately, the Dean of the requisite college may also be contacted.

Metric 2016-2017

EHS METRIC 2016-2017

COMMITTEE AUDITS	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Total
Radiation Safety Committee Audits	10	10	10	10	40
Laboratory Safety Committee Audits	0	0	0	0	0
IACUC Audits - New Protocols	25	30	58	27	140
IACUC Audits - Continuing reviews	75	14	41	46	176
IACUC Audits - Addenda	63	16	8	9	96
IBC Audits	13	16	23	20	72

CHP/ECP SUBMITTED	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Total
CHP	31	35	34	34	134
BCP	31	35	37	31	134
TOTAL	62	70	71	65	268

ORIENTATION	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Total
New Employees	125	120	130	180	555
New Faculty	15	10	20	5	50
Orientations	140	130	150	185	605

ANESTHETIC GASES/VAPORS	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Total
Isosflurane	0	0	0	0	0

TRAINING	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Total
Laboratory Safety/Regulated Chemicals	819	400	643	1005	2867
Hazard Communication	508	182	217	307	1214
ARC Safety Training	45	7	0	0	52
Formaldehyde	98	9	7	9	123
Bloodborne Pathogens	775	372	469	803	2419
Respirator	16	36	143	228	423
Vehicle Safety	49	51	44	29	173
Fire Safety Only	0	5	0	0	5
Fire Extinguisher/Fire Safety	228	96	9	15	351
Plant	75	105	241	83	504
BSL 3	0	0	0	0	0
DOT/IATA Shipping	24	12	18	12	66
Contractor	15	9	12	25	61
Special Classes	0	0	0	0	0
Scissor Lift	0	0	2	2	4
Fork Lift	9	0	0	0	9
Other	0	0	0	0	0
TOTAL	2661	1287	1805	2518	8271

Blackboard	In Person	TOTAL
1050	1807	2867
623	591	1214
45	7	52
123	0	123
1026	1393	2419
136	287	423
0	173	173
0	5	5
0	351	351
0	504	504
0	0	0
0	66	66
0	61	61
0	0	0
0	4	4
0	9	9
0	0	0
3013	5258	8271

ROOM INSPECTIONS (Inspections run from January to December)	July-September	October-December	January-March	April-June	Total
Art Studio				17	17
A.W. Smith			37	37	37
Bingham			43	60	103
Bioenterprise (UDRE), University West	46				46
Biopath					0
Bohwell					0
Biomedical Research Bldg		235	85		320
Cleveland Clinic Foundation					0
Class				22	22
Comoros's Office (UDRCI)					0
Debraze (Biology)				42	42
Debraze			101		101
Debraze			31		31
Doni Hall Smith				1	1
Ferrari LH					0
Goodman					0
MarDonald	23				23
MicroHealth					0
Wills		50			50
MSA	0				0
Abrams			215		215
Olson			23		23
Psychology			132		132
Old Waste Facility					0
RSB					0
Research Tower		40	23		63
Robbins (MSD East)			152		152
Rockefeller				123	123
Scott's Court		12			12
Service Bldg					0
Simulation Center (Vb, Sinai)					0
Stroacker					0
VA Hospital	12				12
Walker	10				10
Wearn	42				42
West Quad (Mc Small) (CCS/B)	6				6
White			11		11
Wickenden				110	110
Wolstein Research Bldg		300	158		458
Wood	20	40	34		94
TOTAL	352	681	1051	543	2627

CRANE INSPECTIONS	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Total
AW Smith	0	0	2	0	2
Rockefeller	0	0	5	0	5
Olin	0	0	1	0	1
White	0	0	3	0	3
Kent Hale Smith	0	0	0	0	0
Birgham	0	0	6	0	6
Total	0	0	17	0	17

RESPIRATOR USE (From FileMaker)	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Total
Physical	17	19	147	35	218
Train (In Person)	16	38	140	21	215
Pft Test	14	56	62	19	151

BIOHOOD REPORTS	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Total
Recertify	62	167	117	61	407
Repair	11	35	22	12	80
Total	73	202	139	73	487

ASHRAE TEST	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Total
Pass	3	0	1	3	7
Restricted	0	0	0	0	0
Fail	0	0	0	0	0
TOTAL	3	0	1	3	7

FUME VELOCITY HOOD TESTING	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Total
Pass	68	122	106	262	558
Restricted	13	26	18	37	94
Failed	5	4	12	20	41
TOTAL	86	152	136	319	699

CLEARANCES	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Total
Relocation	104	85	114	18	322
Repairs	2	8	5	8	23
Disposal	260	196	224	117	797
Demolition					0
Equipment Fabrication (OLIN)	1	7	9	6	23
Renovation					0
Relocation to Storage					0
Termination					0
Clean	1	1		3	5
Return to Vendor			3	1	4
Cold Room Repairs	3	5			8
Decommission	6	4	4		14
TOTAL	377	307	359	153	1196

ERGONOMICS	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Total
Ergonomics Assessment	3	2	10		15
					0

CHEMICAL PURCHASE APPROVALS	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Total
Purchase Approvals	75	75	96		254
					0

HAZARDS MATERIALS SHIPPING	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Total
DOT /ATA SHIPPING					
Aviation Regulated Liquid (Formalin)		0			0
Biological Category B		0			0
Corrosive		0			0
DOT /ATA ¹	14	12	18	12	56
Dry Ice	24	12	7	3	46
Exempt		0			0
Infectious ¹	14	12	18	9	53
TOTAL	24	12	43	24	103

TYPES OF INJURIES	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Total
INJURY TYPES					
Needlestick	11	12	12	5	40
Splash	0	4	1	0	5
Burn	1	3	5	2	11
Concussion/Contusion	2	3	5	0	10
Laceration	20	7	5	11	43
Strain/Sprain	1	8	1	4	14
Slip/Fall	4	20	9	0	34
Inhalation/Exposure	1	2	3	1	7
Bite/Sting	1	1	2	4	8
TOTAL	42	60	43	27	172

INCIDENTS	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Total
Explosion/Fire	0	0	0	0	0
Flood in Lab	0	0	0	0	0
Suspicious Substance	0	0	0	0	0

Unsafe Conditions	0	0	1	1	2
Odor	6	8	10	5	29
Spills/Leaks	2	2	1	3	8
Alarms	0	0	2	0	2
Waste Disposal	3	2	1	4	10
Gas Alarm	0	0	0	0	0
Other (BBP Exposure)	1	0	0	0	1
Equipment Alarm	0	0	0	0	0
Hood Repair	0	0	0	0	0
Flood	0	0	0	1	1
Leak (Water)	0	0	0	0	0
Mercury	1	0	1	0	2
IAQ	1	0	3	1	5
TOTAL	14	12	19	15	60

REPORTED FIRES	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Total
Residence Halls	0	3	0	0	3
Non-Residence Halls	0	1	0	0	1
TOTALS	0	4	0	0	4

FIRE SAFETY REPORTS	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Total
Fire Alarms		72	45	61	178
Hot Work Permits	181	65	46	115	407
Red Tag		1		0	1
Fire Drills		47	1	0	48
Fire Inspection, Complete Bldg.				0	0
TOTAL	181	185	92	176	634

ASBESTOS AND LEAD ISSUES	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Total
Abatements	20	19	19	22	79
Surveys	26	22	26	15	89
Mold Issues	9	13	5	19	46
Lead	5	7	2	4	18
TOTAL	60	61	51	54	226

OTHER MONITORING	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Total
Formaldehyde Monitoring	9				9
Preventative Maintenance Confined Space Shutdowns	13	8	7	10	38
Indoor Air Quality Studies	4				4
TOTAL	26	8	7	10	51

Waste Disposal per Building 2nd Quarter Dec 31, 2016

WASTE TYPE	MILLIS G35	ART STUDIO	DOA 990	CASC	WOLSTEIN	FARM	CORONER'S OFFICE	WEST QUAD	Bioenterprise	Clark Hall	TOTAL
Bottles Collected											0
Requests per Site											0
Containers, Flammable	11		16		2			1			30
Containers, Methanol/Tissue			6								6
Containers, Corrosive	5		6		1						12
Containers, Toxic	1		3		1					1	6
Containers, Formalin			4								4
Containers, Photo Waste		2	3								5
Containers, Mercury	3				1						4
Containers, Mercury Lamp			1		1						2
Containers, Oxidizer	1		1								2
Containers, Samples for Testing											0
Containers, Water Reactive	1										1
Containers, Organometallic											0
Containers, Caustic Liquid Alkali	1		4		1						6
Containers, Sulfides											0
Containers, Gas Cylinders											0
Containers, Asbestos											0
Containers, Non-Hazardous Liquid/Solid	2		3		1				1		7
											0
Expired Drugs			1								1
Flammable Solid	1										1
TOTAL (containers)	26	2	48	0	8	0	0	1	1	1	87

