CASE WESTERN RESERVE UNIVERSITY
DEPARTMENT OF ENVIRONMENTAL HEALTH & SAFETY (EHS)
SAFETY SERVICE OPERATIONS
ANNUAL REPORT 2012-2013

Marc Rubin, Director

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INTRODUCTION

This report is submitted to the president and designated members of the senior administration of Case Western Reserve University as required by the laboratory Safety Committee (LSC) Operating Guidelines. The report summarizes the activities of the Safety Services division of the Department of Environmental Health & Safety (EHS) at the university. Its contents cover the period from July 1, 2012 through June 30, 2013.

SUMMARY

Departmental Strengths

The Safety Services Office (SSOF) operation requires a staff with broad and diverse backgrounds that can address and resolve a wide range of issues faced in chemical, biological, construction, and physical safety at the university. EHS has developed programs that meet or exceed regulatory requirements in all critical safety areas and proactively anticipates new safety regulations.

Departmental Opportunities

Established EHS programs continually evolve to meet requirements of governmentally mandated safety initiatives. EHS also continues to enjoy an excellent cooperative interaction with other university departments that are developing safety-related initiatives. Furthermore, EHS's relationships with outside agencies have augmented the quality of its environmental programs.

ACCOMPLISHMENTSFOR2012-2013

Departmental Accomplishments

Notablenewaccomplishments:

- EHShired a Biosafety Officer and revitalized the biosafety program.
- EHS hired a second person to work in the growing Asbestos and Lead programs.
- EHS implemented Class III and Class IV asbestos training for Facilities, Housing, and IT.
- An RFP was sent out to contractors and consultants in order to define a preferred vendor list for lead and asbestos work on campus.
- EHS worked with the university committees to streamline the review process.
- EHS fully implemented the online Blackboard retraining system.
- EHS completed the rollout of the HP Assist Data System.
- EHS reorganized the Hazardous Waste Program to better serve the University.
- All OSHA programs were updated to reflect the new Global Harmonized System (GHS).

Biosafety Group

An inventory program has been initiated in order to compile an accurate inventory of biological materials on campus from the Risk Group 2 and Risk Group 3 categories. This inventory allows the Biosafety officer to target audits and inspections.

An inspection of the existing BSL-3 and ABSL-3 facilities was accomplished. A number of major upgrades for the BRB 10th floor BSL-3 were identified. The medical school facilities office is working to address the facility's long-term needs.

Changes in regulation removed CWRU from the Select Agents program. This allowed the reorganization of the ABSL-3 and the downgrade of the Path 411 facility from a BSL-3 to a BSL-2.

The Bloodborne Pathogens training was completely restructured to better reflect the needs of the university. As such, the Bloodborne Pathogens program's reach has been extended to include all pathogens, vectors, and regulatory concerns.In addition, the training has been adapted to broaden the target audience to include non-laboratory personnel that may come in contact with biologically active substances.

A program is in the planning stages to setup a mock laboratory that will be used to teach properbiological control.This will include proper sterilization techniques.A streamlining of the IACUC process for submitting protocols using biological materials was completed. This process dramatically simplifies the process and reduces paperwork burdens.

Facilities Group

An RFP was sent out to contractors and consultants in order to define a preferred vendor list for lead and asbestos work on campus. This list consists of consultants for sampling, oversight work and abatement companies to perform removal activities. Additionally, a concise specification document was prepared and included in the RFP.This document defines in detail the allowable activities in the scope of performing consulting and abatement services for the campus.

A program was put into place to cover Class III and Class IV asbestos work with CWRU employees. Training is underway and will be complete in 2013-2014.A detailed accounting of the Personal Protective Equipment and safety equipment in each zone of the facilities group was conducted. A stocking and audit system was put into place to guarantee that safety equipment is inspected and restocked as required.

All of the asbestos records available on campus for the last 25 years are in the process of being entered into a searchable database. This database will allow the easy retrieval of archival materials related to the locations and quantities of asbestos on campus.

The audit program for mechanical rooms is underway. This program is designed to inspect less-traveled areas on campus and to identify and correct deficiencies as they are found.

An inspection of all cranes on campus was conducted. Repairs and/or design changes were made to a number of active cranes.

All Combustible Gas Meter (CGM) devices were replaced with more modern units. These units serve as the primary detection device during confined space entries.

All of the OSHA-required trainings for CWRU facilities personnel were updated and automated. These programs will be placed on the website to allow 24/7 access to training materials.

An initial training class for new, incoming facilities personnel was started and expected to be complete mid-2013. This program will give the incoming worker a solid foundation with which to work. The present updating system uses rotating courses through the year, given each month. This new course brings the new worker immediately into compliance.

A crossover effort was made to train laboratory workers working on solar projects involving large solar arrays. The nature of this work is more in line with the needs of a facilities worker than a laboratory worker. Hence, a special program was established to meet this need.

Chemical Safety Group

All OSHA programs were updated to reflect the new Global Harmonized System (GHS). This includes major changes to labeling and communication documents. As a result, the Material Safety Data Sheet (MSDS) was discontinued and the Safety Data Sheet (SDS) introduced. Roll out of this program will take place in 2015.

All OSHA retraining programs were published to the Blackboard system. This eliminated the handling of paper and the use of fax and mail. All results from training are now directly entered into the training database, eliminating operator error.

All Blackboard-enabled retraining now has a rotating question pool from which a test is generated. This eliminated the possibility of test sharing and makes the tests fresh for each individual.

The laboratory audit program was migrated from Filemaker Pro to HP Assist. This move was both for data consistency issues and as part of a first step towards using a direct data entry system in the field.

Portable tablet devices were purchased that allow the auditor access to the databases in the main office while in the field. This system also allows the inspector to issue work requests and check the status of work request while out of the office.

A move towards a completely paperless system has been underway. As part of this initiative, all PI documents have been scanned and are being prepared for a web portal scheduled to go online in the coming year. This system will allow PIs to directly access the records they have stored with EHS. The portal will allow access to data both to EHS and to the laboratory groups interactively.

The hazardous waste program was modified such that schools are no longer charged for the disposal of hazardous waste produced as a direct result of research. Schools are responsible for the costs of hazardous waste generated as a result of relocations, remodeling, or the departure/retirement of researches. This system has resulted in significant savings through better management of costs.

A change in law deregulated some of the requirements for transporting bio-hazardous waste. This change resulted in a more efficient and more cost-effective program with regards to the disposal of animal carcasses. Previously, a separate truck was required to transport the different classifications of animal carcass. These distinctions are no longer in effect, so a single truck can be used. This program change saves approximately $50,000 per year.

Chemical fume hood data has been transferred to HP Assist. This allows the reference of the PI location and other data with the laboratory audit process in real-time

Changes to the DOT/IATA program have been put in place to address the requirements of ITAR/EAR international shipping requirements.

Training with Visual Compliance was begun to support the use of the program in determining if international shipments are compliant.

Evaluations of laboratory environments for pregnant personnel have been introduced to support the reproductive health program. These audits help target chemicals and other materials that might

be a threat to the worker's unborn child. EHS then works with the PI and the worker to determine the best course of action during the pregnancy.

A challenge for investigators has been the creation and deployment of laboratory specific training. EHS has worked to produce a generic template the PI can use to produce the required training. This system is piloting in Macromolecular Science.

An audit system for the use of highly energetic substances was put into place. This includes a guide document, inventory, and physical inspection. Peer review was also included in the audit process in order that subject experts could be brought into the evaluation.

A process to determine which air systems serve which fume hood was started. This allows the ability to better track issues when they come up.

An audit was performed with FM Global to determine if actions were possible to address insurance safety issues in laboratories. A number of new initiatives came from this process.

Information Technology and Data Analysis Group

The HELIX system was retired and HP Assist was put online.

A consistency checker was designed and placed into service that looks at the data in each database to make sure that the data contained in the data structure meets criteria designed into the data consistency checker.

The website was recoded to meet the requirements of University Marketing &Communications design rules.

Self-check for training was established, allowing personnel to see their training history.

On line training signups for in-person training were established. This system allows personnel 24/7 access to sign up for courses.

All previous PowerPoint presentations were migrated to Articulate-based presentations. This consisted of complete rewrites of all programs.

A series of reports were built to automate the data collection process for a number of programs including the Radiation Safety Program, the Laboratory Safety Program, and the Department Metrics Program were put into place. This allows access to data sorts not previously available without in depth SQL knowledge and database back side access.

Department-wide data backup services were put into place both onsite and offsite. Part of the process involves the changing of drives prior to failure. Drives are changed at period points but not all at once. This guarantees that drives are from different manufacturing batches and are unlikely to fail together.

Goals for 2012-2013

The SSOF will approach the following goals in 2012-2013:

- Implement Globally Harmonized System in Hazard Communication.
- Complete roll out of in-house asbestos program.
- Continue Mechanical Room inspection program.
- Work to develop a Customer Satisfaction survey.
- Implement metrics developed in 2011-2012.
- Implement metrics tracking system.
- Continue to provide a safe and regulatory-compliant environment for CWRU.
- Revise all program SOPS and manuals.
- Overhaul website and implement e-commerce system.
- Work to improve the safety culture of the University through outreach program.

LICENSES/REGISTRATIONS

Case Western Reserve University maintains certificates of registration through:

- The Department of Transportation (DOT)
- The Ohio EPA for Hazardous and Infectious Waste
- The United States Department of Agriculture (USDA) & Center for Disease Control (CDC)
- The Department of Commerce
- The United States Department of Defense (DOD) & United States Army Medical Research and Material Command (USAMRMC)

REGISTRATION #	CERTIFICATE OF REGISTRATION	EXPIRATION DATE	PURPOSE
052907-551-092P	US DOT Research & Special Programs	6/30/2014	Hazardous Waste Transport
18-G-00351	OEPA Generator of Infectious Waste	12/4/2015	Infectious Waste
A20041118-0009	USDA High Consequence Agent Program and CDC Select Agent Program	canceled	Animals/ Plants and Humans/ BSE
1801-0969-R00007	Ohio Department of Commerce	6/30/2014	Underground Storage Tanks
109	US DOD/USAMRMC Funding	10/17/2012	Institutional Facility Safety Plan

- EPA & OEPA RCRA Hazardous Waste Management - 8 sites

REGISTRATION #	LOCATION	EXPIRATION DATE
OHD987033669	DOA 990	12/4/2015
OHD000812230	Millis G35	12/4/2015
OHR000112482	Art Studio (Greenhouse)	12/4/2015
OHG00061689	Bioenterprise (UCRC I)	12/4/2015
OHR000120147	Wolstein (WRB)	12/4/2015
OHD077757425	West Quad (Mt. Sinai)	12/4/2015
OHR000129148	Squire Valleevue& Valley Ridge Farms	12/4/2015
OHD004174660	Cedar Avenue Service Center (CASC)	12/4/2015

Use And Storage Locations

The following facilities are registered for use and storage of chemical, biological, and etiological agents:

- Main campus of 10900 Euclid Avenue, Cleveland, OH
- University Hospitals (UH), 2065 Adelbert Road, Cleveland, OH
- University Circle Research Center II (UCRC II), 11001 Cedar Avenue, Cleveland, OH
- Wolstein Research Building, 2103 Cornell Road, Cleveland, OH
- Louis Stokes Cleveland Veterans Affairs Medical Center, 10701 Wade Park Blvd., Cleveland, OH
- MetroHealth Medical Center, 2500 MetroHealth Dr., Cleveland, OH
- Cleveland Clinic Foundation, 9500 Euclid Ave., Cleveland, OH
- Cleveland Center for Structural Biology (CCSB) Wright Fuel Cell, 1819 E. 101 St., Cleveland, OH

The following premises are registered as generators of infectious waste:

DeGrace (Biology)
Morley
Bingham
AW Smith
Glennan
Wickenden
Nursing
CCSB
Health Services
Wolstein Research Building (WRB)
Millis
Olin
White
Rockefeller
Pathology
Med East (Robbins)
Dentistry
HG Wood
West Quad
Biomedical Research Building (BRB)

The following premises are registered as generators of hazardous waste:

Morley
DOA990
University West
Wolstein Research Building (WRB)
CCSB
Millis
Cedar Avenue Service Center

SAFETY SERVICES PROGRAM: RESPONSIBLE PARTIES

Management

Safety Services provides support for the safe use of chemical, biological agents, equipment posing physical hazards, and equipment used on construction sites. The department reviews procedures, responds to incidents involving chemicals and biological materials, and assesses laboratory infrastructure to mitigate hazards to employees. The department also monitors regulatory compliance through its inspection and audit activities. Departmental audits, Laboratory Safety Committee audits, and external agency audits (insurance and regulatory bodies) are used to promote compliance with federal, state, and local regulatory programs.

Laboratory Safety Committee (LSC) Purpose

The CWRU LSC serves as an advisory committee to the EHS. The LSC is comprised of faculty and staff appointed by the president to guide university programs in the safe use of chemical & biological materials. The LSC advises policies on laboratory safety to ensure compliance with all pertinent regulatory bodies [OSHA, EPA (federal, state, and medical waste), DOT, ODH, FDA, CDC, & USDA].

LSC Membership

The 2011-2012 LSC membership is listed below. The president of the university appoints the voting members of this committee. The committee is also aided by input from ex-officio (non-voting) and visiting members (non-voting).

Voting Members

Clive Hamlin, PhD. Associate Professor Dept. of Pathology WRB 5529 Term Expires: 5/1/2014 Chairperson Term Expires: 5/1/2014	Thomas Gray, PhD. Asst. Professor Dept. of Chemistry Millis 418C Term Expires: 5/1/2014	David Samols, PhD. Professor & Chairman of CWRU Biosafety Committee Dept. of Biochemistry Research Tower 400-8 Term Expires: 5/1/2014
Irene Lee, PhD Associate Professor Dept. of Chemistry Millis G24A Term Expires: 5/1/2014	William Durfee, DVM Asst. Professor & Director Animal Resource Center Wood G48 Term Expires: 5/1/2014	Gregory Tochtrop, PhD Assistant Professor Chemistry Millis 418C Term Expires: 5/1/2014
W. David Sedwick, PhD. Professor, Dept. of Medicine & Director of EHS Radiation Safety Term Expires: 5/1/2014	Christina Hirsch, PhD Associate Professor Dept. of Infectious Disease Robbins 202 Term Expires: 5/1/2014	Andrea Romani, PhD. Asst. Professor Physiology / Biophysics Med East 528 Term Expires: 5/1/2014
Lance Vernon Senior Instructor Dept. of Biological Sciences Term Expires: 5/1/2014		

Ex-Officio Members

Marc Rubin, MS Director of EHS Safety Services Service Building 1st Floor	Laura Bulgarelli Assoc. Dean Finance & Administration Nord Hall 500	Kenneth Klika, PhD Asst. Dean & Director of Facilities Management & Arts & Sciences Crawford 718
Kimberly Volarcik, PhD Executive Director of Research Administration Sears Library	Tom Merk Asst. Director EHS Service Building 1st Floor	Jill Stanley Assoc. Dean Space & Facilities Planning Sears Tower 2503
Felice Porter Asst. Director/Asst. Radiation Safety Officer EHS Quality Assurance Specialist Service Building 1st Floor	Melissa Braskie Director of UH Safety Dept. Service Building 6th Floor Start – 7/1/2011	

Support Staff

Jason May Department Asst. EHS Service Building, 1st Floor

During the 2012/2013 fiscal year covered by this report, the committee met biannually. Major topics considered by the LSC included

- chemistry accident follow-up,
- introduction of the High Hazards Program,
- discussion on roll out of GHS system to campus,
- formation of Safety Committee in Chemistry and findings,
- UCLA Criminal Ruling (LA Times Article),
- compliance data from inspections,
- new online trainings,
- conversion of BSL3 to BSL2 space in ARC,
- streamlined IACUC system.

LSC Responsibilities

The Laboratory Safety Committee is responsible for

- reviewing and recommending laboratory safety programs to comply with regulatory requirements and sound risk management practices.
- consulting with faculty on safety issues related to chemicals, pathogens, and carcinogens, and in cooperation with the University's Biological Safety Committee, recombinant DNA.
- assigning its members, or appropriately qualified non-members, to serve as advisors in specific chemical and biological safety areas.
- conducting audits to assess the effectiveness of EHS laboratory safety programs and procedures.
- approving EHS chemical & biological safety programs as required, which are amended by the following audit recommendations.
- reviewing laboratory activities that may be of concern to the public.

LABORATORY SAFETY COMMITTEE AUDIT RESULTS 2012-2013

Each year, the University Laboratory Safety Committee is tasked with performing a series of audits. These audits test the major programs of EHS Safety Services for consistency, quality, and accuracy. The feedback from the audit is then used for continual improvement of the program.
The programs audited this year includeWebsite, Training Records, Fume Hood Testing, Licensing, Incident Reports, Respiratory Protection, Laboratory Inspections, Chemical Hygiene Plans and Exposure Control Plans, Research Protocols, Indoor Air Quality, and the Hazardous Waste program.

Findings:

Website:

Links are all good
Training is accessible with current versions online
Manuals are not up to date with current revisions and need to be updated

EHS Response:

- The website is slated for a complete overhaul this year. All manuals are being reviewed at this time and will be updated by July.
- A copy editor and distance learning expert are being hired to help reformulate the EHS website. This process will include the building of an e-commerce portal that will allow for better coordination with laboratory workers and primary investigators. This process will also minimize the collection of paper from the laboratories and move the office closer to a paperless environment.

Training Records:

A total of 8,500 individuals were trained with 4,840 trained in class and 3,660 trained online. These numbers reflect multiple trainings for each person and hence do not reflect the number of individuals in the laboratory safety program. A better method of tracking which worker is attached to which laboratory is needed.

The formaldehyde program was combined with the laboratory standard and is no longer offered as a separate course with the exception of medical students taking anatomy.

An effort was made to separate the technical laboratory workers from the standard facilities workers in the right to know program. This allowed a more direct approach with better comprehension.

EHS Response:

Calendar year 2012 was a large development year for the training database. Migration from Filemaker Pro to HPAssist was completed and the online Blackboard training system was deployed. This eliminated the manual handling of testing papers and removed the possibility of human error in regards to recording trainings in the database.

A major effort to clean up the last 20 years of data is underway and nearing completion for training. This process includes identifying those workers and students that are no longer at the university. This also includes properly identifying those workers who may have changed names or moved to a different laboratory. To date, nearly 5,000 workers were either removed or reclassified. This has greatly decreased the number of apparently delinquent workers needing training and in turn, reduced the number of improper training notices sent.

Fume Hood Testing:

- For each type of hood, is the Standard Operating Procedure current?
  - Yes
- Review request forms for certification & repairs of chemical, laminar, and biological hoods. Are request forms current?
  - Yes
- 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?
  - Yes
- Can Safety Services provide a list of those hoods that failed inspection?
  - Yes
- What is the follow-up mechanism for insuring repair of hoods?
  - A request is given to Facilities via the SchoolDudeprogram and then tracked to completion.
- Who is responsible, and on what frequency, for evaluating the progress of hood repair ordered from plant services?
  - Work orders are tracked weekly to ensure repairs are completed and follow up is made by the Safety Services Fume Hood tester.
- What policy is available to ensure timely repair of hoods that are in frequent use?
  - A running list of fume hoods that are out of service is kept and checked weekly to ensue repairs are completed.
- Is the equipment calibration date current?
  - Yes

EHS Response:

The fume hood program is mature. Cyclic testing of fume hoods by velocity test is completed to ensure that the fume hoods still retain the same conditions under which they were tested by ASHRAE 110 tracer gas testing. If a variance is found, a new ASHRAE test is performed to verify the hood is working as expected. The program is running as expected.

Licensing and Manuals:

LICENSE	DATE OF RENEWAL/ EXPIRATION	LICENSE DESCRIPTION	STATUS
US DOT	6/2014	Dept. of Transportation	Active
Infectious Waste	12/4/15	EPA	Active
Hazardous Waste	12/5/15	EPA	Active
Ohio Fire Marshall	6/30/2014	PUSTER/BUSTER Ohio Fire	Active
Select Agents	Canceled Program	APHIS	Inactive
Laboratory Safety Manual	Revision 5/18/2011	Internal	Due
Physical Safety Manual	Revision 7/2003	Internal	Due
Safety Services Training	Current	Internal	Active
LSC Guidelines	6/31/2013	Internal	Active

EHS Response:

All licenses are up to date. The Select Agent Program was canceled for CWRU and will lapse. All manuals are under review and are expected to be updated by the end of July 2013.

Incident Reports:

- Is the Standard Operating Procedure current?
  - Yes
- Number of incidents during the year?
  - 141
- Is the number of incidents increasing, decreasing, or constant relative to previous years?
  - The number of incidents was down in 2012
- What is the classification of incidents (accidents, biohazards, explosions, exposures, fire, odor, spills, other)?
  - The largest number of incidents this year involved unknown odors and suspected gas leaks.
- Appropriateness of remedial action?
  - Acceptable
- Use of outside experts and contractors when necessary?
  - Outside experts were used when required
- Is there resolution documented for each incident?
  - Yes
- Is there a systematic review of outstanding cases by EHS?
  - Yes
- Documentation and integrity of data files?
  - Adequate
- Is there adequate paper (hardcopy) documentation?
  - Yes

- Is this documentation maintained in a readily accessible central file?
    - Yes
- Were any outstanding incidences reported to the committee?
    - The explosion in Millis was brought to the committee and the result was the creation of the High Hazards program

EHS Response:

The program is working well.

Respiratory Protection: (This audit was not completed. Answers by EHS)

- Is the Standard Operating Procedure current?
    - No-It is under revision
- Review in-class respirator training & tests. Is in-class training & test current?
    - Yes
- Review online Respirator training & tests. Is online training & test current?
    - Yes
- Review risk assessments for mandatory respirator wearers.
    - Up to date
- Review risk assessments for voluntary respirator wearers.
    - None is required
- Were job-specific risk assessments carried out before respirators were recommended?
    - Yes
- Was sampling done for each risk assessment?
    - No, only when appropriate
- Were employees respirator trained?
    - Yes
- Is respirator training current?
    - Yes
- Were medical questionnaires completed?
    - Yes
- Was fit test completed?
    - Yes
- Was appropriate type of respirator offered for training and job?
    - Yes
- Is the equipment calibration date current?
    - Yes
- Are risk assessments current (reviewed annually)?
    - They are current but older and should be redone
- Number of risk assessments
    - Anatomy Laboratories: 5
- Number of people trained for mandatory and voluntary respirator use
    - 170 workers were given physicals so that they could wear a respirator if needed.
    - 148 were selected for training.
    - 127 respirators were actually deployed.

EHS Response:

The Respiratory Protection program completed all training and testing as required for those enrolled in the program. N95 testing is greatly reduced due to the dropping of readiness for the Pandemic Flu program.

An increased awareness of respiratory protection with Medical Students utilizing the Anatomy laboratories has led to increased interest in respiratory protection. We expect this program to grow in the coming year as a result.

Laboratory Inspection: (This audit was not completed. Answers by EHS)

- Is the Standard Operating Procedure current?
  - Current as of 2012
- Review inspection report and inspection letter. Are both documents current?
  - Documents are current
- Verify the researcher's laboratory was audited within the year
  - Were non-compliance issues corrected?
- Most compliance issues were closed in 2012.
  - A few have been slow to correct.
- What type of enforcement is utilized?
  - See the LSC Guidelines for details
- What problems are there currently?
  - Food in a laboratory, use of open-toed shoes, open waste containers, improper signs, improper storage, training delinquency, lack of updated CHP/ECP documents
- Number of inspections completed
  - 4,179
- Number of laboratories
  - 4,271 is a 5-year average
- Status of compliance
  - Ongoing, but generally issues are resolved
- Status of follow up
  - Ongoing, but generally issues are resolved
- Were all buildings inspected?
  - All CWRU, UH, Metro, and VA laboratory buildings housing CWRU laboratories were inspected. Some offsite laboratories were not inspected.
- What is the frequency of follow up?
  - Annual
- Verify that program is done on a consistent basis.
  - With the exception of 2010 due to staffing issues, the number of rooms inspected has averaged 4,271 with a low of 3,740 and a high of 4,676 (88%-110%).
  - Inspections in 2012 resulted in a 98% completion rate compared to the 5-year running average of 4,271 rooms. The approximate 10% spread from average was due to some years inspecting offices and bathrooms and other years not inspecting offices and bathrooms.

EHS Response:

The Laboratory inspection program finished its 25 year in 2012 with 4,179 rooms inspected. A five year average for rooms inspected is 4,271 rooms. The breakdown is as follows:

- CWRU:3,845
- UH:168
- Cleveland Clinic:97
- Metro:31
- VA:31
- NASA:7

CHP/ECP: (This audit was not completed. Answers by EHS.)

- What is the administrative mechanism for informing PIs that they need to submit a Chemical Hygiene Plan (CHP) and/or an Exposure Control Plan (ECP)?
    - New PIs are trained one-on-one. If a new PI comes that EHS is unaware of, they are informed when found during the laboratory inspection process. For existing PIs, reminders are sent annually regarding updates.
- Review CHP/ ECP forms. Are forms current?
    - The CHP/ECP system is current but will be overhauled completely in 2013 as an online system.
- What measures are there to ensure that some PIs are not being missed?
    - EHS can only track the PIs they are informed of. If a PI comes to CWRU and sets up a laboratory without notifying EHS, EHS will find the laboratory during the inspection process unless the laboratory is set up in a facility other than a CWRU building. In this case, EHS does not have a mechanism in place to find PIs outside of CWRU buildings that have not notified EHS they exist.
- What is the mechanism for identifying PIs that need a CHP and/or an ECP?
    - New PIs are trained one-on-one. If a new PI comes that EHS is unaware of they are informed when found during the laboratory inspection process. For existing PIs, reminders are sent annually regarding updates.
- 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?
    - EHS can only track the PIs they are informed of. If a PI comes to CWRU and sets up a laboratory without notifying EHS, EHS will find the laboratory during the inspection process unless the laboratory is set up in a facility other than a CWRU building. In this case, EHS does not have a mechanism in place to find PIs outside of CWRU buildings that have not notified EHS they exist.
- Is the Standard Operating Procedure current?
    - Yes
- Is the researcher's signature on the CHP and ECP?
    - Yes
- Ensure that the date is current
    - Files not pulled
- Review laboratory inspections, was the CHP and ECP checked for currency?
    - Files not pulled
- Were infractions corrected?
    - Yes
- Review 10 plans to see if safety is adequate
    - Files not pulled
- What is the mechanism used to track those that have submitted the CHP or ECP?
    - Database
- How many researchers (PIs) have laboratories?
    - 407

- How many delinquent CHPs/ ECPs?
    - There are 407 CHP and 407 ECP (the documents are one)

    - 63 (15%) CHP need updating
    - 40(10%) CHP are more than 3 years out of date

    - 79 (19%) ECP need updating
        - 26 (6%) ECP are from actual users of BBP
        - 53 (13%) ECP are from users that don't use BBP but didn't update their plans stating no use.
    - 38 (9%) are more than 3 years out of date
        - 26 (6%) are actual users of BBP
    - 12(3%) ECP are from users that don't use BBP but didn't update their plans stating no use.

EHS Response:

The same PIs that are out of date for CHPs tend to be the same ones out of date for ECPs. An effort to contact each PI that is out of date for more than three years needs to be made. It is likely that a portion of the investigators out of date may have left or no longer have laboratories. EHS is to launch an online system for the PIs to upload real-time documents that include CHP/ECP documents. During this process, updates from the outstanding PIs will be requested.

Research Protocols: (This audit was not completed. Answers by EHS.)

- Is the Standard Operating Procedure current?
    - Yes
- Verify valid IACUC protocol with signatures in folder
    - EHS does not store paper IACUC records
- Verify current training of researcher and personnel
    - Current
- Has the protocol been signed by EHS?
    - Iris has electronic signatures
- What type of enforcement is utilized?
    - Protocol is not allowed to be active until all issues are resolved.
- What problems are there currently?
    - Assigning personnel top PIs
- Review protocols to see if safety is met
    - Yes

EHS Response:

EHS has worked for two years to establish a streamlined system to provide for the safe use of chemical, biological, and radiological materials with animals. This was accomplished in 2012-2013. This process greatly reduced the burden to both the EHS department during the review process and the researcher as they submit a protocol.

Clearances:

The database has 12 years of records. It is recommended that the database be made into a read-only system so that the data cannot be changed

- Is the Standard Operating Procedure current?
  - Yes
- Number of clearances addressed this year
  - 425 in 2012
  - 207 in 2013
- Was completion timely?
  - Yes
- Were clearances filed correctly?
  - Yes

Classification of clearances

- Is there closure in each clearance?
  - Yes, one is outstanding waiting for disposal
- Are clearances reviewed on a 3 month basis to identify if clearance is still open?
  - Yes
- Are clearances reviewed on a 3 month basis to identify if clearance is closed but paperwork has not been closed out?
  - Yes

EHS Response:

The program is working well. Records are to be locked once written.

Indoor Air Quality and Industrial Hygiene:

- Is the Standard Operating Procedure current?
  - Formaldehyde -2009 Outdated
  - Isoflurane-2009 Outdated
  - Indoor Environmental Quality-needed
- Number of industrial hygiene exposures addressed this year
  - 6 assessments
- Equipment calibration date current?
  - Yes
- Number of individual assessments made within the year
  - Formaldehyde, 3 assessments (11) TWA/(10) STEL
  - Isoflurane, 3 assessments (2) TWA, (3) Screenings
- Number of outside contracts that were issued for air assessments.
  - None
- Number of environmental sampling exposures addressed this year
  - None
- Was sampling done for each exposure?
  - No, not always warranted.
  - 15 bioaerosol and 8 mold swabs taken
- Were the results within compliance?
  - Compliance levels for mold are not established. Sampling for formaldehyde and isoflurane was mixed and required corrective action in some cases.
- Were assessments sent to each employee informing them of the results?
  - Final reports are sent to CWRU Project Managers and facilities contacts for distribution. For personnel sampling,results were also sent to the person sampled.

- Number of asbestos exposures addressed this year
  - There were no asbestos exposures this year.
- Was sampling done for each exposure?
  - N/A
- Were the results within compliance?
  - N/A
- Were assessments sent to each employee informing them of the results?
  - N/A
- Number of bioaerosol exposures addressed this year.
  - 15
- Was sampling done for each exposure?
  - Bioaerosol sampling is by definition a sample
- Were the results within compliance?
  - There are no established exposures to mold.
- Were assessments sent to each employee informing them of the results?
  - A final report is sent in each case to the persons involved.
- Number of lead exposures addressed this year
  - None
- Was sampling done for each exposure?
  - N/A
- Were the results within compliance?
  - N/A
- Were assessments sent to each employee informing them of the results?
  - N/A
- Number of indoor air quality concerns addressed this year?
  - 6
- Was the Indoor Air Quality questionnaire completed for each indoor air evaluation?
  - No, not always needed. None this year.
- Was sampling done for each concern?
  - No, not always warranted.
  - 15 bioaerosol and 8 mold swabs taken
- Were the results within compliance?
  - There are no established exposures to mold
- Was an assessment sent to each employee informing them of the results?
  - A final report is sent in each case to the persons involved.

EHS Response:

An SOP for IH needs to be put together along with a manual. Asbestos, lead, and mold already have SOPs in place, but a general SOP for addressing occupational exposures is needed.

Bloodborne Pathogens Program:

- Is the Standard Operating Procedure current?
  - Yes
- Review current online BBP training & test. Is online BBP training & test current?
  - Yes
- Review current in-class BBP training & test. Is in-class BBP training & test current?
  - Yes
- Verify the number of PIs receiving BBP?
  - The CHP is combined with the ECP. There are 407 PIs with safety plans

- Who follows up on delinquent Hepatitis B vaccinations?
  - Health Services
- Number of personnel trained for BBP?
  - 2,147
- How many personnel are delinquent for annual BBP retraining?
  - 957
  - 90 are more than three years out.
  - 200 are required but have never taken it.
- How many PI's are delinquent for annual BBP retraining?
  - 37 PIs are overdue (35 if you exclude those within a month).
  - 7 are over more than 3 years. All required have taken it at least once.

EHS Response:

The traditional BBP program has been expanded to include the use of pathogens regardless of if they fall into the category of BBP or not. This change was made to better capture the safety hazards of the biosafety program. An effort is being made to better define the actual users of this program. It is suspected that the number of delinquent users is in large part due to misclassifications of workers.

Hazardous Waste Program: (This audit was not completed. Answers by EHS.)

- Is the Standard Operating Procedure current?
  - It needs to be reviewed but no changes expected.
- Inspect the laboratory and both facilities.
  - Done weekly.
- Aisles clear, bench clear?
  - Yes
- Are waste containers overflowing or is waste lying around?
  - No
- Are the waste areas, office, laboratory, and bathroom respectably clean (swept, mopped)?
  - Yes
- Is waste disposed in a timely manner (with 90 days)?
  - Yes
- Are drum records maintained?
  - Yes
- Are the weekly barrel checks logged?
  - Yes
- Verify that all equipment is current in calibration.
  - Yes
- Verify that equipment that is not currently in use has an "Out of Service" label.
  - None, currently out of service.

EHS Response:

The hazardous waste program is working well. Changes were made to the funding method of the program in 2012-2013 that have resulted in significant savings. No inspection by EPA occurred this year.

The biohazardous waste program has seen changes due to a relaxation in shipping regulations in Ohio. This resulted in a significant cost savings of approximately $50,000.00 per year. Inspections by EPA have not resulted in any violations to date.

SAFETY SERVICES OFFICE (SSOF)

Staffing

The SSOF operates with the following staffing:

- Director (1)
- Asst. Director EHS(1)
- Asst. Director/Asst. RSO/Quality Assurance Specialist (0.5)
- Fume Hood Test Specialist (1)
- Biosafety Officer (1)
- Industrial Hygienist (1)
- Hazardous Waste Specialist (1)
- Facilities Safety Specialist (1)
- Facility & Construction Safety Specialist (1)
- Fire safety Specialist (1)
- Department Assistant (1)
- Accountant (0.25)
- Student (1)
- Ergonomic/Chemical Specialist (1)

Staff Changes

- James Dahle, Fire & Life Safety Specialist departed in 2012 and was replaced by Roy Evans in March 2013.
- Shirley Mele, EHS Department Administrator departed in June 2012. Her position was not replaced.
- Lisa Hausmann was added to the staff as an accountant in July 2012.
- Heidi Page was added in July 2012 as a Biosafety Officer.
- Brandon Kirk was hired as a second Asbestos and Lead Project Specialist in December 2012.

Safety Services continues to improve the department's expertise and provide for more flexible response to emergencies and other issues. The SSOF staff is qualified to support and maintain the Safety Services Program.

Subcommittees

EHS is involved with the review process of the Universities safety committees.

- Institutional Review Board for Human Studies
- Institutional Biological Safety Committee (Recombinant DNA)
- Institute of Animal Care & Use Committee (IACUC) (Pathogen Safety in Animals)
- Carcinogen Use Committee (Carcinogen Safety in Animals)
- Select Agent Use Committee (Etiological/ Animal/ Plants/ Humans)

These subcommittees review chemical, biological, and exogenous substance administration protocols for safety content, as well as ensure that specific laboratory safety-related guidelines are met. At present, the information for the exogenous protocols is included with the Pathogen Use Supplement C protocol.During the course of the year, the information contained in the IACUC chemical and pathogen safety forms Supplement B and Supplement C were integrated into the online application.

As of 2012-2013, all complete IACUC and IBC protocols are reviewed by EHS in addition to the specific protocols required by the Chemical Carcinogen, Exogenous Substance, Biological Safety, and Radiation Safety Committees. Many researchers are not aware of all hazards associated with the materials they are working with and consequently may fail to list some of the regulated materials they use. Hence, all protocols need to be reviewed in order to find all regulated materials. A total of 187 protocols involving the use of hazardous substances were reviewed.

Committee Audits

	Year 2013					Year 2012				
	Q1 2013	Q2 2013	Q3 2013	Q4 2013		Q1 2012	Q2 2012	Q3 2012	Q4 2012	
Radiation Safety Committee Audits										
Laboratory Safety Committee Audits	0	0	16	0	16	0	0	0	0	0
IACUC AUDITS	44	35	38	39	156	49	39	65	55	208
IBC AUDITS	6	9	8	8	31	15	15	11	16	57

EHS Email

The EHS Email (does@case.edu) has become a frequently-used safety resource. Since its inception, the number of inquiries and safety concerns reported from CWRU personnel averages 15 emails per day. This email communication has resulted in improved follow-up of issues reported.

Concerns of unethical behavior can be reported by employees to the Integrity Hotline anonymously. Employees may call 866-483-9367or go to https://www.caseintegrityhotline.com.They are encouraged to provide the date, time, location, and any other pertinent information concerning the incident.

EHS Website

The EHS home website (https://www.case.edu/ehs/) provides integrated web-based access to department services. Information on training and retraining classes, as well as EHS safety manuals are available on-line. The EHS web site is updated regularly. The website is slated for a complete overhaul in 2013-2014.

EHS Newsletter

The EHS Laboratory Safety newsletter is designed to keep the campus community informed of laboratory safety issues and concerns. It covers the latest government regulations and addendums, issues found during laboratory inspections, as well as answers to questions frequently asked by laboratory personnel. Safety Services related articles published in the newsletter included:

June/July 2013 (pdf)

Headlines: The Future of EHS; The OSHA Chemical Hygiene Plan; Reducing Aerosols; The Importance of Caution Signs; Radiation Generating Equipment (RGE)

March/April 2013 (pdf)

Headlines: New Laboratory Specific Safety Plans; OSHA's 10 Most Cited Standards; Biosafety Bulletin: Transgenic Insects; Properly Identifying Chemical Bottles; Basic Radiation Safety Tips

December 2012/January 2013 (pdf)

Headlines: New Globally Harmonized System; Safe Use of the Chemical Fume Hood; Surveying Radioactive Packages; Introduction to Data Security; Winter/Holiday Safety

September/October 2012 (pdf)

Headlines: Broken CFL Bulb Guidelines; Six Waste Container Violations; Duties of Laser Supervisor; Electrical Safety in the Lab

June/July 2012 (pdf)

Headlines: Acrylamide Waste Disposal, Dosimetry, Compressed Gas Cylinder Safety, Choosing The Right Ergonomic Office Chair

The newsletter is available to all campus faculty, staff, and students on-line and is distributed as a hardcopy to new employees at orientation. The newsletter is included on the EHS website in digital format. The digital format helps EHS to comply with the ongoing campus green initiative and helps EHS to save money.

Orientation Program

The orientation program developed with Human Resources ensures that new university employees have a general awareness of services provided by EHS. This program establishes job exposure-related safety training classes that employees are required to attend. The goal of this program is to emphasize the importance of safety on campus and to encourage new faculty and staff to advocate safe working practices. Weekly staff orientation sessions are conducted for new employees. There were four new employee orientation sessions that were canceled for fiscal year 2012/2013. As part of this program, the CWRU faculty members were contacted on an individual basis and were provided with information concerning safety.

ORIENTATION	2013	2012	2011	2010
New Employees	521	389	504	474
New Faculty	73	94	72	70

Month	New Employees	Employee Orientation	Faculty Orientation
Jul-12	9	57	11
Aug-12	12	53	17
Sep-12	17	59	10
Oct-12	12	43	8
Nov-12	5	38	1
Dec-12	23	35	3
Jan-13	27	60	7
Feb-13	9	31	0
Mar-13	9	26	1
Apr-13	8	36	1
May-13	10	28	0
Jun-13	18	55	14
TOTAL	159	521	73

Training

A major emphasis has been placed on expanding and refining SSOF training programs. Over the past year, the SSOF made significant progress in contacting individuals requiring new worker training and annual retraining. Training is web or lecture-based at the EHS training center and various campus locations as requested by the group being trained. An effort was completed in 2012-2013 to move away from PowerPoint-based presentations. As a result, Blackboard has been used for all EHS safety retraining. Each slide in the presentation must be viewed in order (participants can no longer skip ahead). This ensures that all training requirements are covered. However, once a slide has been viewed, it can be selected again at any time. Some of the slides may be interactive, giving the participant an opportunity to delve further in understanding a specific topic. Blackboard use has resulted in the elimination of manual handling of tests and sign-in sheets.

The concluding slide of each presentation provides participants to a comprehensive test. The test is set up with the provided Blackboard plug in. Each OSHA program covers a number of required topics. The topic-related questions are entered into a pool of questions. The test is programmed to randomly generate questions and answers from each topic, ensuring that no two tests are the same. The Blackboard test opens up in a new window, giving the participant the opportunity to review slides as they answer questions.

The grades from each exam are automatically recorded in the Blackboard Grade Center and then electronically transferred to the EHS database. Reminders are automatically emailed to participants annually, to remind them to take the retraining. The EHS database also transfers new employee information to the Blackboard Grade Center.

The following Safety Services training courses are available online:

- OSHA Laboratory Standard
- OSHA Bloodborne Pathogen Standard
- OSHA Hazard Communication Standard
- Filtering Face Piece Respirator Standard
- Radiation Safety
- Laser Safety
- BSL3
- Hazardous Materials Shipping
- Ancillary Radiation
- UV Safety

The Hazard Communication training, which includes required university employee-specific Right-to-Know training, addresses specific safety concerns of the target audiences. The largest groups that were provided HAZCOM training included housekeeping, dental, nursing, grounds, ARC (Animal Resource Center), facilities, police and security, and shipping/mailroom. Groups receiving this training may only occasionally enter research areas, but nonetheless may encounter hazardous situations or hazardous materials exposures if not properly alerted.

Combination Safety Training

This training is a compilation of Hazard Communication, Lab Standard, Biohazards with Bloodborne Pathogens, And Ancillary Radiation.Also included in this training are Generated Waste Streams and Emergency and Security Awareness. This training addresses specific safety concerns of the target audiences. The largest groups provided training include housekeeping, medical, nursing, grounds, ARC, facilities, custodial, IT, police and security, and shipping/mailroom. Groups receiving

this training may only occasionally enter research areas, but nonetheless may encounter hazardous situations or hazardous materials exposures if not properly alerted.

Regulated Waste Training

Custodial crews, both employed by Case and contracted by Case, are required to take this annual training, which is conducted by the EHS department's waste expert.

Chemical Safety Awareness Training

Several general awareness classes for target groups such as the Animal Resource Center and housekeeping were conducted. These groups may enter specialized laboratories on a daily basis and thus require training specifically tailored to their work.

Laboratory Safety Training

Laboratory Safety Training is given to all personnel who work in laboratories. Several specialized Laboratory Safety classes for specific target groups included medical and dental students, Macromolecular Science and Chemical Engineering personnel, and the National Youth Sports Program (NYSP), Summer Program in Undergraduate Research (SPUR), Summer Undergraduate Research Program (SURP), Upward Bound, and Center for Layered Polymeric Systems (CLIPS), and Equinox Summer Programs.

The university's temporary worker service, Kelly Services, trains temporary employees using SSOF training documents in Laboratory Safety and Bloodborne Pathogens as part of this program.

Bloodborne Pathogen Training (BBP)

Materials containing and/or likely to contain Bloodborne Pathogens (Human Immunodeficiency Virus (HIV), Hepatitis B, and Other Potentially Infectious Materials (OPIM)) are widely used in the University laboratories. BBP training includes compliance awareness and implementation of required vaccination and health monitoring programs.

Biological Safety Level 3 (BSL-3) Training

Extensive training is required for individuals who enter the BSL-3 facility to use these agents.

DOT/IATA Shipping Training

Personnel who prepare materials for shipment regulated by the Department of Transportation's Pipeline and Hazardous Safety Administration (PHMSA) or the International Air Transport Association (IATA) are trained every two years as mandated by these agencies using training materials prepared by EHS. These shipments are principally biological and include IATA-defined Infectious Substances.

Number trained July 1, 2012 - June 30, 2013: 93

This program is expected to grow as new initiatives are put into place to meet the requirements for international shipping. Part of this will involve the use of Visual Compliance software to check that the receiving persons, companies, and countries are not on a watch list or prohibited from receiving the exported items to be shipped.

Respirator Training

Special training sessions for Facilities Services, Animal Resource Center (ARC), and BSL-3 Facility employees were conducted. This training was augmented, as required by OSHA, with medical

evaluations and respirator fit testing. Contractors were required to be trained by their employers before entering the BSL-3 and ABSL-3 facilities.

Vehicle Safety Training

Vehicle Safety Training is presented on an as needed basis. EHS conducted 27 Drivers Safety Training classes for CWRU employees and the summer help staff, training a total of 146 people.

Facilities Safety Training

Training for Facilities Service personnel is conducted on a scheduled basis. A total of 32 classes were presented, including make-up classes, containing 317 Plant and Facility Employees. Topics included

- Slips, Trips, and Falls/ Ladder Safety,
- Personal Protective Equipment,
- Confined Space Entry,
- Radiation Safety,
- Lockout/ Tag out,
- Workplace Cleanliness,
- Hot Work Permits,
- Powered Industrial Pallet Jacks,
- Powered Industrial Lift Truck,
- Hearing Conservation Training & Testing, and
- Asbestos, Lead, and Mold.

These sessions are scheduled to accommodate all Plant Services shifts. Three training sessions were developed and offered for plant personnel every month.

A new training was developed to cover new facilities employees. This course contains the basics required to start work and come up to speed without having to attend a full-year cycle before all courses are given. This combined course will greatly enhance the facilities safety program.

Contractor Training

To ensure that university community members and laboratory personnel are not exposed to hazardous conditions on the campus during construction and repair activities, a variety of training programs support construction work on the campus. There were a total of 29 formal classes for 176 people.Specific training includes:

Contractor Safety Awareness Training Outline

- Firearms or weapons
- Contractor parking
- Trash removal types
- Emergency response contact phone numbers
- Contractor Safety Representative
- Contractor Safety Policy Manual Information (major OSHA-required programs)
- (Contractors are responsible to provide written programs and training for)
    - Respiratory Program
    - Lock/Tag Program
    - Confined Space Entry Program
    - Hot Work Permits
    - Hazard Communications Program
    - PPE Program

    - Fire Extinguisher Training
    - Trenching, Shoring and Scaffolding
    - Reach lifts and JLG Equipment
- Working Safely in Case Laboratories
- Hazard Communications Program
    - Case chemical MSDS sheets available at EHS Office upon request
    - Contractors must have M.S.D.S sheets available on site for chemicals used on the site
- Confined Space Entry Program
- Hot Work Permit Program
- Fire Protection Systems shut down or modification
- Lockout Tagout Program (Zero Energy Assurance)
- Personal Protective Equipment Program
- Asbestos, Lead, Mold Abatement Program

An additional program was started to help contractors find and work with consultants so that they can meet their OSHA and EPA obligations. Many contractors do not have access to consultants that can help them assemble working OSHA programs such as respiratory protection, asbestos, lead, or other required programs that are legally required to work on campus. EHS, in cooperation with facilities, works to put contractors and consultants together.This increases the available pool of contractors for CWRU to choose from and helps the companies to be ready to work in other environments compliantly.

Facilities and Equipment

The university administration and the LSC ensure that all facilities, equipment, and personnel are available and adequate for the safe operation, storage, and disposal of hazardous material. The SSOF is also responsible for reviewing regulated safety infrastructure and inspection of all facilities and equipment where chemical and biological materials are used. Facilities that are available at the university for activities involving use of hazardous materials include

AW Smith	Bingham	BRB
Bishop	Bolwell	DeGrace
Glennan	Hanna Pavilion	HG Wood
Kent Hale Smith	Med East	Millis
Olin	Pathology	Rockefeller
Service Building	Wearn	White
Wickenden	UCRC II	VA Hospital
MetroHealth	NASA	CCF- Walker
Wood Research Tower (RT)	West Quad (CCSB)	RBC
WolsteinResearch Building (WRB)	UCRC I (Bio-Enterprise)	

Laboratories

The University Safety Service programs monitored approximately 3,500 labs in 29 laboratory buildings on campus. These laboratories are located in four hospitals, the CWRU Quad and the Medical, Nursing, and Dental School facilities, as well as other offsite locations.

CWRU's laboratories are equipped for research programs requiring use of hazardous material and specialized equipment. Protective engineering devices in laboratories typically include chemical hoods and Biosafety cabinets, eye wash stations, and safety showers (where needed). Air handling systems are generally designed to provide 8-15 changes of air per hour and to preclude

recirculation of air in research laboratories. Laboratories are generally constructed to at least Level II containment specifications. Laboratories are required to stock needed decontamination supplies and personal protective equipment (PPE) such as gloves, laboratory coats, eye protection, and job-specific respiratory protective equipment.

Safety Services Office

Safety Services' facilities and equipment are located in the Service Building (1st Floor), Medical School (DOA990), Millis Science Center (G35), and the Wolstein Building (1103).

Program Office:

Service Building (1st Floor)-Program offices & Conference Room:

Up-to-date hardware is crucial to ensure efficient and quick access to records in the SSOF. A Smart Board system augments the in-house training program, and allows our trainers to directly demonstrate the use of online database and training materials. It further provides direct access to library services and campus maps during staff meetings and emergency incident exercises or responses. This room also houses a Campus Emergency Operations Center (CEOC).

The Carbonite backup service is currently used for two EHS Servers (EHS, onsite server). The web server (Aurora) is backed up, and the files are copied locally on magnetic storage and periodically backed up onto optical storage discs.

The Department of Environmental Health & Safety has completed transitioning to the use of Employee ID numbers in lieu of Social Security Numbers in its training program since 2008.

Chemical Laboratory:

Service Building (1st Floor):

The SSOF is located in the Service Building on the 1st Floor at 2220 Circle Drive. The Safety Services division of EHS operates a laboratory equipped with industrial hygiene equipment, chemical-hood sampling equipment and cylinders, mercury vacuum equipment, respirator fit-test equipment, and spill and emergency response supplies. Equipment is also available for quantification of contaminants in air samples, EPA audits, and identification of unknown chemicals.

Hazardous Waste Facilities:

Facilities are located in the 1st floor parking area of the CWRU School of Medicine, 1st floor of the Wolstein Research Building, and the ground floor of the Millis building. All facilities contain a processing area and a storage area.

Medical School Waste Facility:(DOA990)

This facility has a separate office and process/storage room for chemical material and disposal activities. This room has a filtered air exhaust system. It also has a chemical and walk-in hood, air monitoring equipment, and emergency response equipment.

Millis Waste Facility:

This waste facility is located on the ground floor in Millis G35. It is directly across the hall from the Fisher Scientific Chemical Stock Room. The waste facility has an office, a processing area, and a storage area. The waste storage area has shelving and flammable storage cabinets. The processing area has a walk in hood, chemical hood, and emergency response equipment. The office also has an emergency phone.

Wolstein Waste Facility

This facility has an office and process/ storage area for hazardous material and disposal activities. This area is maintained at negative pressure relative to the adjacent hallway. The waste facility contains spill supplies and a computer. Available equipment allows access to web-based databases in the event of a chemical or biological spill. The area also contains a chemical hood, walk-in hood, and meters for environmental monitoring.

Animal Resource Centers (Arc)

Animal care facilities are located in Med East (Robbins), Wearn, Wickendenand Wolstein Research buildings. Conventional animal care facilities are available in each of the Animal Resource Centers and are used by researchers to conduct animal studies with radioactive, chemical, and biological materials. A variety of animals (mice, rats, hamsters, rabbits, ferrets, and large animals such as sheep, dogs, and pigs) are housed in one facility. The Wearn and Wolstein Facilities predominantly house mice. Contaminated items are stored in the ARC freezer until disposal. The university maintains ABSL-3 laboratories for safe handling of infectious agents in both laboratory and animal research applications.

Instrument Calibrations

Properly-calibrated instruments are necessary for Industrial Hygiene (IH) and hood certifications. Annual factory calibrations of eight industrial hygiene, respirator, ventilation, noise, and lighting instruments are maintained. Table 5 of the Appendix lists instruments maintained for the Safety Service Program.Forty-eight in-house air monitor calibrations were performed during July 2012 to June 2013.

SAFETY SERVICES PROGRAMS

General Commitments and Services

The SSOF is meeting its commitments to conduct programs in compliance with local, state, and federal regulatory programs. Regulatory compliance areas managed include OSHA, NIOSH, EPA, CDC, APHIS, FDA, DOT, IATA, NFPA, ASHREA, NESHAPS, DHS, DOD, NIH and other sister state and local regulations.

Safety Service Office (SSOF) and Principal Investigators (PIs)

Laboratory safety is a shared responsibility between the Safety Services office and Principal Investigators. The SSOF is responsible for implementing safety programs in accordance with Federal, State, and Local regulations and sound risk management principles. Principal Investigators (PI) are responsible for monitoring safety during experiments in accordance with these established programs. Laboratory inspections carried out by EHS aid in laboratory safety program compliance and implement University regulatory programs in individual laboratories.

Inspections

Laboratory inspections are conducted to address chemical, biological, and physical concerns and to measure the progress and depth of compliance in the university laboratories. Concerns and violations are summarized on the inspection report and mailed to the researcher. Researchers are asked to address and correct their safety issues by a specified date. Some issues represent repeated items from the previous year. Repeat violations are elevated for additional scrutiny.

CWRU has more than 400 PIs authorized to use chemical and biological materials in more than 3,500laboratories and 4,500 rooms. Inspections include physical inspections, verification of

training records, verification of correction of previous violations, and follow-up. Audits are more frequent if there are particular concerns in a laboratory.

CWRU interacts directly with the safety groups monitoring safety in associated institutions that are under independent management but may provide research locations occupied by university personnel. Such research laboratories are located at CWRU University Hospitals, the Cleveland Clinic Foundation, Metro Hospitals, NASA, Bioenterprise, Coroner's Building, and the Cleveland VA Hospital. Where regulatory interfaces are impacted, letters of agreement between the institutions supports these activities.

Inspections of outlying sites are carried out at University Hospitals (UH), Metro Health, Cleveland Clinic Foundation (CCF), NASA, Bioenterprise, Coroner's Building,and Veterans Administration (VA) Hospitals through cooperation of the safety offices at these institutions. Squire Valleevue Farm and Valley Ridge Farm and university-owned property are also inspected or audited. The Inspection Program for Chemical Safety compliance also investigates and resolves biological safety compliance and hazards.

Responses to the majority of inspections are received within 30 days of the inspection. Outstanding inspections are sent to the department chairperson for follow up. Programmatically, repeated issues that are not addressed by the investigator or chairperson can be referred to the deans or provost for further action, but these measures are rarely required.Inspection statistics for 2012/2013 are presented in Table 6 of the Appendix.

Safety problems found during the 2012 inspections were followed-up and audited to increase compliance. In 2013, inspections have demonstrated that this procedure achieved better compliance and resulted in fewer repeat violations.

SPECIFIC SAFETY PROGRAMS

Osha Laboratory Performance Standard

The OSHA Laboratory Performance Standard requires compliance with a number of specific programs and procedures.

Material Safety Data Sheet (MSDS) Program

MSDS are available online through Chemwatch at the EHS Website. The university provides this access to Material Safety Data Sheets (MSDS) for chemicals used in laboratories at local computer terminals in each laboratory. This database currently gives access to MSDS for more than3 million chemicals and mixtures of chemicals and comprehensively covers the greater than 60,000 chemicals in use at various times at the university. In a few basic chemistry laboratories, the laboratories develop their own safety information for unlisted compounds synthesized during the course of research project execution.

Chemical Hygiene Plans/ Exposure Control Plans

All laboratories working with chemicals and/or Bloodborne pathogens are required to generate, educate, and make available to their personnel the contents of their Chemical Hygiene (CHP) and Exposure Control Plans (ECP). Example forms and instructions are currently on-line at the EHS website.

PLANS	12/13	11/12	10/11	09/10	08/09	07/08	06/07	05/06	04/05	03/04	02/03
CHP	407	394	403	283	289	230	194	159	42	21	24
ECP	407	386	395	328	280	227	49	33	35	19	23
TOTAL	814	780	798	611	569	457	243	192	77	40	47

Pregnant Worker Program

Any worker who is pregnant or thinks she may be pregnant may complete a Declaration of Pregnancy Form at the EHS. Services include job specific evaluation, which includes monitoring of hoods, calibration of equipment, inspections of workspace, and critical examination of MSDS information for chemicals used by pregnant workers.Seven workers completed the Declaration of Pregnancy Form this fiscal year and their laboratory protocol was reviewed and adjusted when necessary.

Purchases

Purchases of chemicals, biologicals, and compressed gas cylinders are approvals through EHS. There were 568 requisition approvals during 2012/2013.

INDUSTRIAL HYGIENE

Regulated Chemicals

Through occupational hazard assessments, the more frequently-used regulated chemicals are reviewed each year. Additionally, there is a yearly review of users. The results of this survey dictate the kind of monitoring that should be implemented. Initiation of the assessment technique for regulated chemicals consists of a questionnaire attached to a quiz for new training programs. All new employees must attend initial Regulated Chemical Training, and any employee using a regulated chemical must take the annual online retrain. The Regulated Chemical training has now been incorporated into the Laboratory Safety Training.

Agent-specific sampling plans are utilized for the medical, dental, biology, and nursing anatomy laboratories. Formaldehyde vapor samples are periodically carried out for anatomy laboratories. The samples collected provide analyses of Short Term Exposure Limits (STEL) and 8-hour time Weighted Average Permissible Exposure Limits (TWA-PEL). Anatomy laboratories used virtual examination of the body over the past year which reduced exposures. Formaldehyde monitoring was performed in Robbins Building Gross Anatomy rooms: EG20, EG24, E329, and E330. Measured exposure levels continue to remain below the OSHA permissible exposure limit (PEL) and short term exposure limit (STEL).

NIOSH has issued lower exposure levels than OSHA has adapted. Further, formaldehyde has been reclassified from a suspect carcinogen to a known carcinogen. Thus, even though the anatomy laboratories are in compliance with OSHA standards as presently required by law, EHS has stressed and offered respiratory protection more strongly than in past years.

Indoor Air Quality (IAQ) Monitoring

The IAQ monitoring protocol ensures that concerns are addressed in a timely manner using the appropriate techniques. Air monitoring is carried out when necessary and an assessment is made through sampling and analysis by outside consultants or EHS. Outside consultants provided compliance monitoring in the following areas:

- Asbestos and Lead-Based Paint Hazard Management
- Environmental Laboratory Analysis
- Indoor Air Quality Management
- Environmental Compliance Services
- Industrial Hygiene, Health and Safety Services
- Assessment and Remediation of Microbiological Contamination

Six IAQ complaints were investigated over the past year. Follow up included assessment through questionnaires, performance monitoring, contracting for in-depth monitoring, analysis of consultant results, and presentation of summary reports. Follow up is executed when the analyses are complete. A report is written assessing the results and given to any complainants and their immediate supervisors.

ENVIRONMENTAL MONITORING

Required environmental sampling protocol ensures collection of samples from various media in a timely manner (e.g., soil, surface water, ground water, and containers). All environmental sampling is addressed on a case-by-case basis.

Anesthetic Gas Monitoring Program

Concerns about anesthetic gas exposures led to development and implementation of an anesthetic gas-monitoring program. The anesthetic gas and vapors that leak into work areas during medical procedures are considered waste anesthetic gases. People who work in hospitals, operating rooms, dental offices and veterinary clinics can be exposed unnecessarily to harmful levels of waste anesthetic gases. The waste anesthetic gases and vapors of concern are nitrous oxide and halogenated agents (vapors) such as halothane, isoflurane, methoxyflurane, trichloroethylene, and chloroform. Some potential effects of exposure to waste anesthetic gases are nausea, dizziness, headaches, fatigue, and irritability, as well as sterility, miscarriages, birth defects, cancer, and liver and kidney disease.

In locations where anesthetic gases are used and employees are at risk for exposure to waste anesthetic gases, exposure may be assessed and/or controlled by some or all of the following:

- Effective anesthetic gas scavenging systems that remove excess anesthetic gas at the point of origin.
- Effective general or dilution ventilation
- Good work practices on the part of the health-care workers, include:
    - the proper use of controls
    - proper maintenance of equipment to prevent leaks
- Periodic personnel exposure and environmental monitoring is used to determine the effectiveness of the overall waste anesthetic gas control program.

The table below shows which specific gas monitoring's were carried out.

ANESTHETIC GASES/VAPORS	12/13	11/12	10/11
ISOFLURANE	3	3	10

The table also shows that isoflurane is the anesthetic gas in predominate use. Researchers use anesthetic gas in the ARC and in their laboratories. Three anesthetic gas setups in the laboratories were inspected. The researchers that use anesthetics gases are now identified through their IACUC protocols.

Asbestos Monitoring

The human respiratory system has basic mechanisms to filter inhaled air. However, even with natural defenses at work, some particulate material does pass through and reach the lung wall. Once attached to the lung wall, most particles are attacked and destroyed by large cells called macrophages. Because asbestos is a mineral fiber, the macrophages are unable to remove it from

the lung. The macrophages deposit a coating on the asbestos fiber, and scar tissue begins to form around it.

Asbestosis, lung cancer, and mesothelioma are three diseases associated with asbestos exposure. Asbestosis is characterized by fibrotic scarring of the lung. It's a restrictive lung disease that reduces lung capacity. Asbestosis is prevalent among workers who have been exposed to large doses of asbestos over a long period of time.

Studies indicate that employees exposed to industrial concentrations of asbestos have an increased risk of lung cancer. This risk is compounded for smokers who work with asbestos. Mesothelioma is a cancer of the chest cavity lining. It's the rarest of the three asbestos-related diseases.

Asbestos fibers are very light or aerodynamic and, when disturbed, float in the air for longer periods of time. They cannot be seen in air. OSHA has established an eight-hour time-weighted average (TWA) permissible exposure limit (PEL) for employees to 0.1 fibers per cubic centimeter of air. Employees cannot be exposed to concentrations of asbestos exceeding 1.0 f/cc averaged over a 30 minute sampling period.

Employers with employees likely to exceed these exposure levels need to implement engineering or work practice controls to reduce possible exposures below the established limits. If these controls are not feasible or can't by themselves reduce the exposures to acceptable levels, then respiratory protection, protective clothing and other personal protective equipment (PPE) must be implemented. Asbestos regulations have been promulgated by a number of agencies and are extensive and complex.

Appendix A in OSHA's Asbestos Standard identifies the mandatory protocol for conducting asbestos air monitoring. A continuous flow pump capable of delivering a flow rate of between 0.5 and 2.5 liters per minute is required. The sampling medium must be a mixed cellulose ester filter membrane, designated by the manufacturer as suitable for asbestos counting.

Once the samples are collected, they must be analyzed by methods that include physically counting of the asbestos particles by an analytical laboratory.

Asbestos monitoring is addressed on a per case basis. EHS and/or consultants sampled and analyzed multiple asbestos projects throughout the campus and CWRU Farms. An average of 114 requests was made for support of construction and renovation projects. Laboratories were a major part of the renovations this year. For all projects positive for asbestos, a request was submitted to Facilities, Construction, and Housing or arrangements were then made by EHS to have the area remediated by an approved asbestos contractor.

Bioaerosol Monitoring

The Semi-Annual Bioaerosol Monitoring Project was suspended since historical data revealed that this program could be curtailed as a cost-saving measure. Monitoring continues to be conducted on a case-by-case basis. Three mold assessments were carried out this year. Areas in which samples tested positive for mold growth were abated.

Lead Monitoring

The EPA, as well as the OSHA Lead in Construction Standard, requires all remodelers working in pre-1978 residences to follow the lead-safe work practices. In April 2010, the EPA announced several new actions to prevent lead paint poisoning. Almost a million children have elevated blood lead levels as a result of exposure to lead hazards, which can lead to lower intelligence, learning disabilities, and behavioral issues. In addition, adults exposed to lead hazards can suffer from high blood pressure, headaches, and memory loss. Children under six years old are most at risk. The EPA announced these three Lead Standard-related actions:

- A final rule to apply lead-safe work practices to all pre-1978 homes, effectively closing an exemption that was created in 2008.
- A notice of proposed rulemaking to require dust-wipe testing after most renovations and provide the results of the testing to the owners and occupants of the building. For some of these renovations, the proposal would require that lead dust levels after the renovation be below the regulatory hazard standards.
- An advance notice of proposed rulemaking to announce EPA's intention to apply lead-safe work practices to renovations on public and commercial buildings where lead-based paint hazards may be created by renovations on the interior of these public and commercial buildings.

Lead paint sampling monitoring is addressed on a per case basis. For all projects with positive bulk samples for lead-based paint above regulatory limits, a request is submitted to CWRU Construction Project Managers or arrangements are made by EHS to have the area remediated by an approved contractor. There was an average of 100 requests for sampling made for commercial buildings and one request made for a CWRU-owned residence.

Respirator Program

The OSHA Respiratory Protection Program is designed to protect workers from airborne hazards in the absence of feasible engineering controls. Currently, experimental requirements for respiratory protection in CWRU laboratories is limited largely due to biological work involving N95 respirators. A few laboratories only require chemical protection. The largest portion of the respiratory protection program is aimed at less controlled areas such as those encountered by emergency response workers and Plant Services Workers. Workers and students sometimes wear additional respiratory protection devices on a voluntary basis. Such voluntary use occurs in anatomy classes and in animal resource facilities by personnel who attend to animals in the ABSL-3 facility.

The Respirator Protection Plan includes:

- Physical Evaluations
- Respirator Training
- Fit-Testing
- Annual Questionnaire

An inventory of respiratory protection equipment was carried out that included cartridges, filters, face pieces, wipes, and valves. All response personnel have a face piece that is used at least once per year. Medical school personnel are responsible for their own cartridge replacements.

There are currently approximately 123 people in the Respirator Safety Program. Medical evaluations were completed for 215employees. Respirator Safety Trainingwas attended by 182 employees, and 123 were fit-tested for a respirator. Those workers that did not report for physicals

are not able to wear respirators and are actively encouraged to complete their certification. Workers who utilize respiratory protection who do not receive a fit test are users of powered air purifying respirators (PAPR). Most of Plant Services falls into the PAPR user category because of the vigorous physical demands of their occupational use. The custodial workers will only receive a fit test if there is an outbreak of a disease like pandemic influenza at the university. The statistics of this program are shown in Table 7 of the Appendix.

As concerns about pandemic flu have decreased, we have commensurately decreased the number of people who need a respirator.

HOOD CERTIFICATION PROGRAM

Chemical Fume Hoods

The objective of this program is to ensure that the laboratory chemical fume hoods used at CWRU are functioning in a manner capable of providing protection for faculty, staff, and students who use them. This includes performance testing, reporting and responding to equipment failure, scheduled maintenance, appropriate steps necessary to safeguard workers who perform repairs, and the responsibility for implementation of this policy. The following duties EHS assumes to meet these objectives are listed below.

- Ensure that hoods are evaluated at least annually
- Inspect monitor, sashes, lights, service fixtures, interior, baffles, and cabinets in conjunction with annual face velocity measurements and local smoke test.
- Provide information to users on guidelines and operating procedures for safe use of hoods and monitor operation.
- Label hoods with certification stickers, sash arrows, and a work practices guide.
- Coordinate with facilities on required maintenance items and issue clearance before repairs and recertify after repairs.
- Perform ASHRAE test on all new hoods and on installed hoods when relocated or after HVAC work is performed.
- Notify facilities when fume hood monitors require additional service.
- Provide HVAC contractors with CWRU fume hood policy requirements for new and installed hoods.

Velometers and smoke tubes with data download capabilities are used for the annual face velocity tests. Fifty-seven work order requests were initiated with facilities for chemical hoods that were performing below par and needed repair. High velocity is the biggest issues concerning the chemical hoods.

Fume hood testing information is recorded in the database maintained at the EHS Office. The database includes Principal Investigator (PI), department, building, room number, hood ID # and hood type, velocity (fpm), monitor type, ASHRAE data and tester initials. The fume hood certification is characterized as follows:

- **Certified**: A hood is considered certified when the average face velocity at a minimum working sash height of 15" is between 80 - 120 fpm.
- **Not Certified**: If the face velocity at 15" working sash height is below 80 fpm or above 150 fpm, the hood is considered not certified. A DO NOT USE sign is placed on the sash and the PI is advised not to use the hood.

- Face velocity tests were conducted on 628 chemical hoods, while ASHRAE 110 tests were done on only 2 chemical hoods over the past year. Certification of chemical hoods by Safety Services that were located in off-campus facilities was transferred to University Hospitals (155) MetroHealth Hospital (26) and Veterans Administration Hospital (19) facilities and a process was set up to obtain copies of chemical hood certifications from each Facility Safety Officer.

Currently, ASHRAE testing is done for only new or repaired hoods. Chemical hoods located in off-campus facilities are maintained by the respective building owners and with assistance by EHS when needed or requested.
The statistics for the hood certifications are shown in Table 8 of the Appendix.

Biosafety Cabinets and Laminar Flow Hoods

There are approximately 350 biological safety cabinets and laminar flow hoods on campus. biosafety cabinets (BSC) and laminar flow hoods were certified through a contracted company, ENV Services. An online database on the EHS website allows the researcher to sign up for re-certification or repair of their laminar flow hoods and Biosafety cabinets.

BIOHOODS	12/13	11/12	10/11	09/10	08/09	07/08	06/07	05/06
RECERTIFY	NA	159	341	326	253	181	234	274
REPAIR	NA	28	3	6	88	51	25	31
TOTAL	258	187	344	332	341	232	259	305

CLEARANCE / RELOCATION PROGRAM

The EHS coordinates safety clearance of equipment and laboratory spaces in need of repair, renovation, and relocation. EHS staff ensures safe transition of materials and equipment to new locations and also the proper decommissioning of existing locations ensuring the disinfection and decontamination process for equipment and biosafety cabinets, chemical and biological waste disposal, and communication with professional movers and researchers.

The implementation of the Clearance Program centralizes the process of equipment and maintenance surveys. The Laboratory Relocation and Termination Procedures are used for moves, departures from the university, and safety clearances. There were 627 clearance forms issued, which covered clearance of 847 pieces of equipment. This equipment was either moved or discarded during the 2012/2013 fiscal years. There were 27 Primary Investigators (PIs) representing more than 30 research laboratories that relocated for different purposes such as decommissioning, renovation, relocation, or termination.The results are shown inTable 9 of the Appendix.

EHS specialists accrue many man-hours assisting researchers in cleaning out their laboratories. Tasks include moving, decontaminating, recycling, and discarding equipment and materials. These interactions with investigators continue to foster cooperative interaction with other university departments and build lasting relationships.

DOT / IATA SHIPPING PROGRAM

The SSOF facilitates and expedites the shipping of Hazardous Packages for Departments. The DOT/IATA (International Air Transport Association) Shipping Program was established to provide employees with instruction in the shipping of hazardous materials according to DOT, ICAO, and

IATA requirements. The Department of Transportation (DOT) and the FAA have precise regulations with respect to packing, labeling and transport of hazardous materials. Therefore, employees who handle regulated materials are required to receive training. ChemTrek was maintained as the emergency responder for shipments originating at the university.

Training Guidelines for Exempt Human Specimen & Dry Ice were developed and implemented in May 2008. There have been 17 special training sessions for Exempt Human Specimen shipment and 40 for dry ice shipment using the training materials. There were a total of 86 packages of dangerous goods sent from the university by FedEx alone.

INCIDENT / INQUIRY PROGRAM

The Incident/Inquiry Program was established to ensure that all incidents and inquiries were handled in a timely manner and appropriately documented. This record included all incidents involving emergency response, indoor air quality, and other types of non-standard assignments (Table 11 of the Appendix). Injury investigation and reporting was also reestablished. Formal interviews following incidents are conducted along with follow up. Finally, preventative measures are documented and the record is sent to the Risk Management Department. The complete spectrum of incidents is listed in Table 12 of the Appendix.

EMERGENCY RESPONSE PROGRAM

Following the 9/11 tragedy in 2001, the federal government put into place a National Security Alert System that codes the level of security required on a daily basis. When the DHS threat level is raised from yellow to orange, the EHS staff increases its on-call schedule to 24-hour status. The EHS Conference Room has been designated as the Emergency Operations Center (EOC) should the need arise. Several secondary locations were added in 2013.

Collaboration with CWRU Protective Services, Cleveland Fire and Hazmat, as well as Summit County Hazmat, in live-scenario trainings, has improved communication and allowed outside response partners to become familiar with the university campus.

The EHS coordinated its Fire & Life Safety Program with the Risk Management Department to prospectively meet FM Global Insurance recommendations concerning the safety of the university. Follow up of specific safety concerns were again completed and which documented better compliance with each year.

EMERGENCY RESPONSE PLAN

The EHS Emergency Response Plan was reviewed and revised to integrate with the Campus Incident/Emergency Management Plan. This EHS plan was distributed to university staff, Cleveland Fire Department, Cleveland Police Department, and surrounding hospitals. With the heightened post-9/11 security levels, and in response to events that have taken place at the university, the need for full-scale emergency response compatibility is mandatory. A committee headed by the University Emergency Management Director has been assembled to plan exercises leading to an emergency scenario involving the university personnel and its city and regional partners in police and fire departments, and emergency services. Working with Protective Services and the University Police Department, EHS has begun to assemble an expanded collaborative network that includes Cleveland Fire, Cleveland Police, University Heights Police, University Hospitals, and the County Emergency Medical Association (EMA). The EHS has also established representation on the Lake County Emergency Preparedness Committee, the Regional Medical Response System (RMRS) Committee, and the University Hospitals Emergency Preparedness Sub-Committee of the Environment of Care Committee.

RESPONSE EQUIPMENT

All emergency response vehicles and response equipment are checked and maintained regularly. Many of the items are old and need replacement. Table 13 of the Appendix illustrates equipment that supports response readiness at CWRU and supplies kept on hand for these purposes.

Other forms of response equipment have been incorporated into the inventory such as tack cloth for powder clean up and mercury thermometer containment tubes. Personal Protective Equipment (PPE: goggles, gloves, N95 respirators, and chemical respirators) has also been evaluated for adequacy and the types of materials kept on hand were augmented to increase response capabilities.

FIRE & LIFE SAFETY

We have now expanded our resources to include Fire & Life Safety. We have added a Fire Safety link to the EHS website with documents: a log for fire issues on the campus for 2012 and 2013 as well as the Fire Safety Reports for 2010, 2011, and 2012. The annual Fire Safety report documents fire safety programs and statistics for two calendar years.

There were five fire-related incidents documented for this fiscal year. There were 25 full building fire safety inspections performed during this time frame as well. Red tag permit requests authorizing fire protection impairments totaled 28, and 803 total hot work permits were issued, with 451 issued by the Fire and Life Safety Specialist. A total of 196 fire drills were conducted for Residence Halls and Greek houses.

Building specific emergency action plans are in the process of being written. These plans give building occupants a detailed plan that is used in times of emergency, i.e. fire.

- BRB Emergency Action Plan Completed and tested 9/13/12.
- Alumni Center (North Side) Emergency Action Plan Completed and tested 2/21/13
- Gund Hall (Law School) Emergency Action Plan is in final stages. Training needs to be conducted as well as testing.
- Dental School's Emergency Action Plan has been approved by Dental School staff, floor coordinators are being chosen.
- Nursing School's Emergency Action Plan has been written and is under review by Susan Frey.
- Veal Center's Emergency Action Plan has been written and is under review by Brian Carpenter.
- Dively's Emergency Action Plan has been written and is under review by Laura Watt.
- Med East's (Robbins/Sears Tower) Emergency Action Plan has been written and is under review by Jill Stanley.
- Kelvin Smith Library's Emergency Action Plan is in final stages of being written.

Training

- Fire Safety presentation for Resident Summer Assistants (22 attendees) for Chris Beyer, May 15, 2013.

- Fire alarm panel training was conducted for new employees of the CWRU Police/Security team (5 officers). This training shows the officers how the panel works, how to bypass detectors, how to re-enable detectors, and how to read the panel in times of alarm.

2013 Fire Alarms:

- 162 Fire Alarms. 5 of the alarms were actual fires.

2013 Fires in Residence Halls:

- Triangle 1, front lobby security desk. Cause was accidental (Electrical, overheated transformer) 2/24/2013.
- House 3A, 4th Floor. Cause was accidental (Hat placed on top of a plugged in lamp) 4/10/2013.

2013 Fires in Non-Residence Halls:

- Pathology Building. Cause was accidental (unattended cooking), 1/29/2013.
- KHS 5th floor. Cause was accidental (flash fire from chemical reaction), 3/12/13.
- CCSB Outdoor dumpster. Cause was undetermined, 3/15/13

2013 Outdoor Fires:

- Lot 52. Mulch fire (near parking meters), 4/23/2013
- WRB. Mulch Fire on 4/24/2013
- Lot-53. Smoking receptacle on 4/27/13

2012 Fire alarms:

- 290 Fire Alarms. 7 of the alarms were actual fires

2012 Fires in Residence Halls:

- Sherman House, 4th Floor Men's Bathroom. Cause was electrical. 9/4/2012
- Theta Chi, Kitchen. Cause was cooking in the oven. 12/4/2012

2012 Fires in Non-Residence Halls:

- Strosacker, 2nd floor janitor's closet. Cause was undetermined. 7/18/2012
- Med School, WB9. Cause was hot work igniting flammable gas. 9/21/12
- WRB, basement. Cause was electrical (water leaking into electrical outlet). 10/30/2012

2012 Outdoor Fires:

- Between Fribley and Tippit. Smoking receptacle. 9/19/2012
- Softball Field. Transformer fire. 10/29/2012

BIOLOGICAL SAFETY

A full time Biosafety Officer was added to the EHS group in July of 2012. Some of the accomplishments for the year include:

- An inventory program has been initiated in order to compile an accurate inventory of biological materials on campus from the Risk Group 2 and Risk Group 3 categories. This inventory allows the Biosafety officer the ability to target audits and inspections.
- An inspection of the existing BSL-3 and ABSL-3 facilities was accomplished. A number of major upgrades for the BRB 10th floor BSL-3 were identified. The Medical School Facilities office is working to address the facility needs long term.

- Changes in regulation removed CWRU from the Select Agents program. This allowed the reorganization of the ABSL-3 and the downgrade of the Path 411 facility from a BSL-3 to a BSL-2.
- The Bloodborne Pathogens training was completely restructured to better reflect the needs of the university. As such, the Bloodborne Pathogens program's reach has been extended to include all pathogens, vectors, and regulatory concerns. In addition, the training has been adapted to broaden the target audience to include non-laboratory personnel that may come into contact with biologically active substances.
- A program is in the planning stages to setup a mock laboratory that will be used to teach proper biological control. This will include proper sterile technique.
- A streamlining of the IACUC process for submitting protocols using biological materials was completed. This process dramatically simplifies the process and reduces paperwork burdens.

BSL-3 Facilities

Currently there is one BSL-3 facility for potentially dangerous agents including HIV and Mycobacterium Tuberculosis. There were no researchers added over the last year that are using a select agent in a regulated quantity. There was a BSL-3 facility dedicated to prion research that was downgraded to a BLS-2 facility when prions were removed from the select agents list.

ABSL-3 Facilities

As a result of the deregulation of prions as a select agent, the use classification for prions has been lowered to better reflect the actual hazard involved. Prions are now regulated as a BSL-2 hazard. This reclassification and the end of the Select Agents program offered the ability to re-evaluate the usage of the ABSL-3 facility. As a result the number of rooms actually used for ABSL-3 work has been reduced to 2. The remaining rooms now house ABSL-2 use research.

Select Agent Program

This program was terminated in December of 2012 when prions were removed from the select agents list. A questionnaire is still sent out to track usage that might reactivate the program

PHYSICAL SAFETY

The EHS Facilities group was expanded to include a new Specialist I. The growing burden of environmental regulation in construction and remodeling projects required the addition of a second person to assist the EHS Industrial Hygienist.

The facilities group is comprised of a Facilities Safety Specialist responsible for all OSHA compliance with the University Facilities group, a Fire Safety Specialist, an Industrial Hygienist, and a Construction Safety Specialist

Notable efforts for 2012-2013 include:

An RFP was sent out to contractors and consultants in order to define a preferred vendor list for lead and asbestos work on campus. This list consists of consultants for sampling, oversight work and abatement companies to perform removal activities. Additionally, a concise specification document was prepared and included in the RFP. This document defines in detail the allowable activities in the scope of performing consulting and abatement services for the campus.

A program was put into place to cover Class III and Class IV asbestos work with CWRU employees. Training is underway and will complete in 2013-2014.

A detailed accounting of the personal protective equipment and safety equipment in each zone of the facilities group was conducted. A stocking and audit system was put into place to guarantee that safety equipment is inspected and restocked as required.

All of the asbestos records available on campus for the last 25 years are in the process of being entered into a searchable database. This database will allow the easy retrieval of archival materials related to the locations and quantities of asbestos on campus.

The audit program for mechanical rooms has is underway. This program is designed to inspect areas less traveled on campus and to identify and correct deficiencies as they are found.

An inspection of all cranes on campus was conducted. Repairs and/or design changes were made to a number of active cranes.

All of the OSHA required trainings for CWRU Facilities personnel were updated and automated. These programs will be placed on the website to allow 24/7 access to training materials.

An initial training class for incoming facilities personnel was started and expected to be complete mid-2013. This program will give the incoming worker a solid foundation with which to work. The present updating system uses rotating courses through the year given each month. This new course brings the new worker immediately into compliance.

A crossover effort was made to train laboratory workers working on solar projects involving large solar arrays. The nature of this work is more in line with the needs of a facility worker than a laboratory worker. Hence, a special program was established to meet this need.

Physical Safety Manual

The Physical Safety Manual is available online. Distribution of the manual is carried out through direct contact with investigators during inspections, publication of the EHS website, and by promotion in the EHS Newsletter. Laboratories that do not have an emphasis on chemical use can find many applicable safety recommendations in the Physical Safety Manual; however, all laboratories should be concerned with physical safety. (This manual was removed from the website in July 2013 for a complete overhaul.)

Facility Inspections

Scheduled building walkthroughs are conducted by Facilities each week. Under this program, each building, excluding residence halls, is inspected twice a year. The EHS focuses on possible safety/building code violations as well as life safety (means of egress) and fire protection/prevention issues. Ninety buildings were inspected this year by EHS. Inspections were carried out on an on-call basis before execution of any maintenance procedures that could result in hazardous exposures.

EHS, in cooperation with Property Management also inspects university-owned rental properties annually. The EHS further inspects underground storage tanks (UST) that may be found on properties owned by the university. One UST is housed at the Wolstein Research Building. City inspectors inspect this UST biyearly. These inspections address potential code violations as well as fire/life safety hazards and general liability issues. Recommendations for correction/improvements are made as necessary and response is timely.

Remedial Services

The Safety Specialist incorporates on-site problem solving in all areas of physical safety. The EHS received many calls for help in solving on-site problems such as means of egress issues, ergonomics, noise problems, and lighting problems. These issues are addressed as needed.

Hearing Conservation Program

The Hearing Conservation Audiometric Testing and Training Program are ongoing. The services of the Cleveland Clinic and a Licensed Audiometric Specialist continue to be enlisted for this program. This annual program includes approximately 133 CWRU employees.

In an attempt to identify and resolve possible noise hazards on campus, sound level monitoring is addressed on a per case basis. No sound level monitoring assessments were conducted this fiscal year 2012-2013.

Lighting Program

The Safety department, on an as-needed basis, conducts primary lighting measurements to evaluate lighting in work environments for adequacy. Measurements are compared to the OSHA/ANSI Standards. Recommendations are made to improve lighting quantity and quality. No lighting assessments were conducted this fiscal year 2012-2013.

PLANT SAFETY

The EHS Plant Safety Specialist met monthly with the Zone Safety Committee to address unusual problems and individual problems and concerns. Several pieces of safety equipment are distributed to plant personnel as needed.

The Plant Safety Specialist is always available to plant personnel during all hours of the day or night. Means of communication include pagers, cellular phones, and radios.

Plant Safety Manual

A Plant Safety Manual has been compiled, published, and distributed by EHS. This manual includes safety considerations, pertinent situations and topics regularly faced by plant maintenance workers.

Facilities OSHA Programs

Job Safety Analysis allows the plant-skilled tradesmen to be more efficient and safety oriented. EHS is continually developing Standard Operating Procedures for safe operation in each relevant plant safety area.

Exhaust Fan Maintenance

There were 28routine maintenanceshutdowns of the fan exhaust: Medical School (12), BRB (8), KHS (4),and RT (4). All exhaust fanareas were monitored to ensure safe air quality for plant personnel before maintenance and filter replacements. This operation occurs after work hours on a quarterly basis.

Confined Space Program

"Confined Space" means a space that:

- is large enough and so configured that an employee can bodily enter and perform assigned work; and
- has limited or restricted means for entry or exit (for example, tanks, vessels, silos, storage bins, hoppers, vaults, and pits are spaces that may have limited means of entry.); and
- is not designed for continuous employee occupancy.

OSHA uses the term "confined space" to describe such spaces. In addition, there are many instances where employees who work in confined spaces face increased risk of exposure to serious hazards. In some cases, confinement itself poses entrapment hazards. In other cases, confined space work keeps employees closer to hazards, such as asphyxiating atmospheres or the moving parts of machinery. OSHA uses the term "permit-required confined space" (permit space) to describe those spaces that both meet the definition of "confined space" and pose health or safety hazards.

The Confined Space program was reviewed and revised this year including permitting, signage, and training. Twenty-one permits for entry were issued this year for CWRU employees and outside contractors working on CWRU property.

Hot Work Permits

OSHA requires hot work permits for soldering, welding, and any type of heating operation. The EHS administers this program for plant personnel and the contractors. The permit is attained from the SSOF, after an inspection of the site, to check for adequacy, and a fire watch is established on the site. The permit is required to be posted near the site. Hot work permits are issued daily.

The Hot Work and Hot Work Permitting Programs were reviewed and revised this year. The program now includes site and equipment inspection as well as training. Eight hundred threepermits were issued to CWRU employees and outside contractors. EHS reviews hot work permits, campus construction by contractors, and CWRU maintenance projects by facilities. This statistic is held by the Fire and Life Safety Specialist and is found under the heading "Fire and Life Safety" above.

CONSTRUCTION SAFETY

An EHS representative oversaw the Hazardous Materials Waste Collection Program of Construction Debris Recycling for Fluorescent Bulbs and Ballasts, weekly Construction Safety Walkthrough Inspections on projects throughout campus, and participated in the construction managers' weekly project meetings on the projects.

Contractor Oversight

The Plant Safety Specialist conducted weekly construction safety walkthrough inspections on projects throughout the campus for outside contractors and university employee projects. Contractors utilized by the university for large projects include the movers, painters, carpenters, plumbers, packers, apprentices, helpers, drivers, electricians, pipe fitters, and roofers. University plant personnel respond to small projects and maintenance issues. The interface between plant, construction administration, technical assurance, and outside contractors on safety related issues has aided in the efficient and safe conclusion of projects.

Contractor Safety Awareness training includes all types of contactors and personnel that carry out construction on university property. There were 29 classes for 176 different outside contractors conducted.

EPA AND WASTE DISPOSAL PROGRAM

Environmental Releases

The Northeast Ohio Regional Sewer District (NEORSD) requires semi-annual reports as part of best management practices (BMP) for minimization of mercury discharge from dental offices to the Cleveland sewer system to a regulatory level of 25 parts per trillion. University sewer releases were in compliance with both federal and state regulations. The report for January through December 2012 was filed on February 2013.

The chemical waste disposal volume remains the same. A regular audit of all manifests is routinely carried out to ensure all manifest records are complete before the 42-day time limit impact by EPA regulations. Approximately 2,500 Hazardous Waste Forms from 2012-2013 were scanned into the database and organized into folders on the server. The number of bottles listed on the forms varies from one bottle to several bottles per pickup. The scanned forms were then verified against the Hazardous Waste Log Book for discrepancies.

Treated Infectious Waste

Treated Infectious waste at CWRU is autoclaved before landfill disposal. Autoclave Certification was first completed for disposal of biohazardous waste in November of 2003. The Infectious Waste License will be renewed for three years in December 2014. Renewal is in progress. Elements of this disposal program include ongoing validation testing and quality assurance testing of the autoclave. These tests use test packs to assess sterilization following autoclaving under standard conditions. The samples are then incubated for 24 hours, 48 hours, and one week. Growth in any of the samples would indicate failure of the decontamination process and reassessment of the autoclaving procedures Records of autoclave certification are kept both in hard copy and an electronic database on the EHS Server.

Quality assurance testing is carried out once a month to ensure the autoclave unit is functioning properly. An average of 674 loads was treated per month equaling 8,490cubic feet of infectious waste.Infectious waste treated in the SaniPak Autoclave equaled 1,780 pounds and was transported by CWRU Custodial to the American Landfill in Ohio. The volume was lower due to problems with the truck and the SaniPak machine. Healthcare Waste Solutions (HWS) incinerates the remaining waste.

Infectious State Medical Waste

Healthcare Waste Solutions (HWS), the waste disposer, incinerated all regulated medical waste until July 2011. As of Aug 2011, Stericycle became the waste disposer. This waste included dead animals that were infected with infectious material, syringes, needles, and potentially infectious materials. The total number of Regulated Medical waste boxes that were incinerated totaled 9,094boxes containing a total 184,220 pounds of waste for the fiscal year.

Non-Infectious Animal Carcasses

Non-infectious animal carcasses are being incinerated through Stericycle (formerly BFI) as of February 2010. This has decreased the amount of infectious waste going for incineration. These boxes are checked weekly to ensure that the poundage per box does not exceed fifty pounds and to ensure that there are no radioactive animals found. There have been an average of 1,245 boxes disposed containing a total 44,195 pound of carcasses for the fiscal year.

Recycling Program

Facilities Services is now handling the collection and disposal of e-waste.

WASTE FACILITIES

CWRU Waste Facilities are used to segregate and prepare waste for disposal. There are a great many waste streams on the campus. Most materials are sent out for disposal by incineration. Items that cannot be incinerated are treated to meet federal disposal standards before burial in a subtitle 'C' Hazardous waste landfill. Burial of hazardous wastes is discouraged as a method of disposal due to the continued liability of buried Hazardous wastes. As part of the waste minimization program, researchers are encouraged and instructed in how to reduce the volume of waste generated in the laboratory.

Waste Disposal

The hazardous waste program was changed in July 2012 so that the schools no longer pay into the program for waste disposal unless there is a special project or activities involving construction. A total of $ 394,442.71 was spent with $195,681.00 spent on actual waste disposal and $198,761.00 spent on personnel, equipment, facilities, and other support items.

Hazardous waste sites are used as central collection points for what the EPA defines as a Large Quantity Generator (LQG) site. CWRU presently has 17 sites. The university also operates two 90-day waste accumulation areas that are inspected on a weekly basis. The accumulation areas are located at DOA990, Millis G35, and WRB 1103. Any of the conditionally exempt small quantity generator (CESQG) sites can be designated as an LQG if more than one kilogram of an acutely hazardous waste is produced and collected from a site. In one calendar month, WRB is the most likely CESQG to become an LQG by this standard.

The hazardous waste disposer was Chemical Analytics for Hazardous Waste, PCB material, batteries, non-PCB ballasts, and mercury. Disposal site waste distribution and recycling are shown in Table 14 & 15 of the Appendix.

REGULATORY INTERACTIONS

EPA/ RCRA Inspection

There were no violations noted during the Comprehensive Quarterly Inspections of the Autoclave Unit conducted by the Environmental Protections Agency/Resource Conservation & Recovery Act (EPA/RCRA) that took place by Cleveland Health Department during 2011/2012.

OSHA Complaints

No Occupational Safety & Health (OSHA) complaints were received in 2012/2013.

APPENDIX

TABLE 1 - Training and conferences attended in 2012-2013 included:

- RCRA Hazardous Waste Operations – Refresher
- Fire Safety in the Laboratory – Webinar
- San-I-Pak Operations Training
- CPR/AED Training
- Safety Fundamentals for ASP Examination Ohio BWC Course
- DOT Certification for Infectious Materials Training
- CSHEMA Regulatory Webinar
- Bloodborne Pathogen Ohio BWC Course

TABLE 2 - All staff members received:

- IT Security Training Online
- Radiation Safety Technician Training
- CPR/AED Training
- 8-hour RCRA Hazardous Materials Manager Refresher Certification Online
- The Hazardous Waste Operations and Emergency Response Standard (HAZWOPER) Certification

TABLE 3 - EHS Webpage Updates:

- New Biohood Company
- Website Format
- Updates
- Annual Fire Safety Report
- WISER
- Memorial Wall

TABLE 4 - Historical Training Trends

TRAINING	12/13	11/12	10/11	09/10	08/09	07/08	06/07	05/06	04/05	03/04	02/03
Hazard Communication	423	1699	2191	601	791	481	197	118	276	272	52
Laboratory Safety	3115	2856	3880	2602	2581	2032	2364	1884	1754	753	940
Regulated Chemical	*	967	2962	1375	1163	868	1720	0	0	0	0
Formaldehyde	237										
Bloodborne Pathogen	2222	2745	3573	2093	2036	1396	1400	1330	1001	859	910
Respirator	207	180	184	483	481	177	44	103	73	118	70
Vehicle Safety	146	162	164	149	118	94	156	98	128	135	0
Fire Safety	22										
Fire Extinguisher	0	87	50	0	0	0	75	75	72	60	0
Plant	317	866	710	600	600	600	70	240	280	282	0
BSL3	10	77	86	78	78	30	29	38	39	49	0
DOT/IATA Shipping	94	121	75	391	118	169	55	168	26	15	4
Contractor	176	190	137	356	330	317	328	422	118	190	80
Special Classes	-	322	327	910	902	890	395	396	207	195	90
Other	-	532	537	2002	1181	0	0	0	0	0	0
TOTAL		10,805	14,876	11,640	10,379	7054	6833	4872	3974	2928	2146

*Included with Laboratory Standard

TABLE 5 -Calibrated Instruments

INSTRUMENT	MODEL	SERIAL #	FREQUENCY	NEXT DUE
Bios Defender Low Flow	ML-500-10	113779	Annually	8/29/2013
Mini-Buck Calibrator	M-30	M-5648B	Annually	10/14/2013
Mercury Vapor Analyzer (Jerome)	431-X	1835	Annually	1/3/2014
Mercury Vapor Analyzer (Jerome)	J405-0007	40500498	Annually	10/18/2013
CMS-Analyzer Unit	640-5050	ARKH-0164	Annually	Out of Service
Accuro (Hand Pump)		ARSE-FO23	No Calibration	No Calibration
Accuro (Automatic Pump)	2000		No Calibration	Out of Service
IAQ CALCCO, CO2, RH, Temp	7545	T75451148003	Annually	4/9/2014
Airchek Sampler	224-PCXR7	523142	As Needed	No Calibration
Airchek Sampler	224-PCXR7	523121	As Needed	No Calibration
Airchek 2000	210-2002	00529	As Needed	No Calibration
Airchek 2000	210-2002	00820	As Needed	No Calibration
Airchek 2000	210-2002	00870	As Needed	No Calibration
Airchek 2000	210-2002	00503	As Needed	No Calibration
Airchek 2000	210-2002	00868	As Needed	No Calibration
Pocket Pump	210-1002	07413	As Needed	No Calibration
Miran Sapphire (ASHRAE)	205B	205B-67068-357	Annually	Out for calibration
Miran Sapphire (ASHRAE)	205B	205B-79375-398	Annually	Out for calibration
Shortridge Instrument(Velocity Meter)	ADM-870C	M04132	Annually	Out of Service
Extech (Light Meter)	407026	Q102498	Annually	Out of Service
Tramex Survey Encounter (Moisture Meter)		SE 10061608	No Calibration	No Calibration
DelmhurstAircheck 2000 Charger	BD-2100	52921	As Needed	No Calibration
UXR Boroscope			No Calibration	No Calibration
VelociCalc Plus	8384A	57020273	Annually	Out of Service
VelociCalc Plus	9535	0720005	Annually	3/13/2014
VelociCalc Plus	9545	0807001	Annually	Out for calibration
VelociCalc Plus	9545	0807006	Annually	3/13/2014
FitTester QuantitativeRespirator Leak Rate Analyzer	3000	0189	Annually	8/29/2013
MultiRae Personal Multigas Monitor	PGM50-5P	095-512273	Monthly	In House-Monthly
MultiRae Personal Multigas Monitor	PGM50-5P	095-518178	Monthly	In House-Monthly
MultiRae Personal Multigas Monitor	PGM50-5P	095-518221	Monthly	In House-Monthly
MultiRae Personal Multigas Monitor	PGM50-5P	095-518218	Monthly	In House-Monthly
MultiRae Personal Multigas Monitor	PGM50-5P	095-518200	Monthly	In House-Monthly
Pulse Check Pump Module	710466	G1-5713-F99	Annually	Out of Service
Pulse Check Pump Module	710466	G1-5712-F99	Annually	Out of Service
Pulse Check Pump Module	710466	G8-15922-L01	Annually	Out of Service
Pulse Check Pump Module	710466	G1-5709-F99	Annually	Out of Service
Pulse Check Pump Module	710466	G1-5710-F99	Annually	Out of Service
Quest Sound Level Meter	2900	CDD010048	Annually	Out of Service
Quest Sound Calibrator	QC-10	QID020090	Annually	Out of Service
Quest Sound Calibrator	QC-10	QIE 070033	Annually	Out of Service
Quest Octave Band Filter	OB-100	HWD020018	Annually	Out of Service
Quest Noise Pro DL Dosimeter	NoisePro DL	NLE 080021	Annually	Out of Service
Quest Noise Pro DL Dosimeter	NoisePro DL	NLE 080022	Annually	Out of Service

TABLE 6 - Inspection Statistics

In this table, "Rooms Inspected" includes laboratories, closets, mechanical room, offices, classrooms, dark rooms, cold rooms, tissue culture facilities, and animal rooms. All areas are inspected to ensure proper storage and maintenance as well as to document changes in use of a room.

BUILDING NAME	12/13	11/12	10/11	09/10	08/09	07/08	ROOMS INSPECTED IN 2006/07
ART STUDIO	1	0	0	0	0	32	32
AW SMITH	96	152	113	128	128	126	125
113	120	114	131	124	124	122	143
BISHOP	20	0	20	0	0	20	20
BOLWELL	16	0	16	0	0	18	19
BIOMEDICAL RESEARCH BLDG.	461	415	244	469	495	614	876
CLEVELAND CLINIC FOUNDATION	1	0	0	3	3	5	0
CEDAR AVENUE SERVICE CENTER	0	0	0	0	0	3	34
CLAPP	0	66	0	33	33	0	30
CLARK	0	0	0	0	0	0	0
DEGRACE (BIOLOGY)	0	80	0	41	41	42	42
DENTAL	96	218	228	228	228	233	221
GLENNAN	136	217	188	204	219	193	137
HANNA PAVILION	0	0	0	0	0	45	45
HEALTH SERVICES	0	0	0	0	0	41	39
KENT HALE SMITH	207	224	141	182	182	199	193
LERNER UH	20	0	20	0	0	0	0
LOWMAN	0	0	0	0	0	0	1
MACDONALD	33	0	31	30	24	44	42
MATHER GYM	0	0	0	0	0	0	0
MATHER MEMORIAL	0	0	0	0	0	0	0
METROHEALTH	33	0	38	85	93	88	77
MILLIS	211	130	209	204	204	240	190
MORLEY	0	0	0	0	0	0	39
NASA	17	0	13	0	0	0	0
NURSING	113	143	215	0	139	144	131
OLIN	66	112	103	89	89	118	118
PATHOLOGY	133	111	126	179	141	148	143
RAD WASTE FACILITY	0	0	0	0	0	0	2
RBC	48	0	48	34	48	47	68
RESEARCH TOWER	184	96	0	94	108	147	90
ROBBINS (MED EAST)	299	219	218	96	66	273	237
ROCKEFELLER	121	14	87	93	93	89	91
SEARS BLDG.	2	0	0	2	2	0	0
SEARS TOWER	0	0	0	0	0	74	103
SERVICE BLDG.	0	0	0	0	2	4	6
SQUIRE VALLEYVIEW FARM	0	0	5	0	0	1	3
STROSACKER	13	120	19	19	19	2	3
VA HOSPITAL	19	1	169	24	24	31	17
WEARN	91	100	0	72	55	118	44
WEST QUAD (MT. SINAI) (CCMSB)	28	0	32	29	29	24	34
WHITE	120	0	0	124	124	126	126
WICKENDEN	139	4	141	151	151	146	141
WOLSTEIN RESERCH BLDG.	553	587	528	609	583	872	615
WOOD	662	455	285	286	295	273	273
UCRC II	0	0	0	8	9	27	36
UNIVERSITY WEST	60	0	61	100	100	89	90
TOTAL	4118	3578	2805	3740	3851	4818	4676

TABLE 7 - Respirator Statistics

RESPIRATOR USE	USERS 12/13	USERS 11/12	USERS 10/11	USERS 09/10	USERS 08/09	USERS 07/08
PHYSICAL	215	123	305	325	481	388
TRAIN	182	113	184	349	440	354
FIT TEST	123	146	175	199	277	205

RESPIRATOR TYPE	USERS 12/13	USERS 11/12	USERS 10/11	USERS 09/10	USERS 08/09	USERS 07/08
PAPR	3	3	3	0	11	3
HALF FACE	0	0	1	1	1	2
FULL FACE	8	5	10	12	32	35
N95	114	138	158	184	158	51
N/A	0	0	3	2	75	114
TOTAL	125	146	175	199	277	205

DEPARTMENT	RESPIRATOR USERS 12/13	RESPIRATOR USERS 11/12	RESPIRATOR USERS 10/11	RESPIRATOR USERS 09/10	RESPIRATOR USERS 08/09	RESPIRATOR USERS 07/08
TERMINATED FROM PROGRAM	0	0	0	0	46	59
ARC	40	33	44	49	45	25
RESEARCH	31	51	82	84	47	33
CUSTODIAL	0	0	49	80	136	107
FARM	0	0	3	4	1	1
HEALTH SVCS.	0	0	1	4	18	0
SECURITY	0	0	40	38	82	68
PLANT	43	39	62	61	75	64
EHS	11	23	24	29	31	31
TOTAL	125	146	305	349	481	388

TABLE 8- Hood Certification Statistics

ASHRAE TEST	12/13	11/12	10/11	09/10	08/09	07/08	06/07	05/06	04/05	03/04	02/03	01/02	00/01
PASS	1	2	5	54	6	6	13	6	90	20	65	58	149
RESTRICTED	0	0	2	2	0	0	0	7	17	3	17	21	54
FAILED	1	0	0	0	1	1	0	0	0	4	16	15	17
TOTAL	2	2	7	65	7	7	13	13	107	27	98	95	221

VELOCITY TEST	12/13	11/12	10/11	09/10	08/09	07/08	06/07	05/06	04/05	03/04	02/03	01/02
SATISFACTORY	351	309	197	231	298	288	527	156	296	121	431	0
RESTRICTED	275	233	155	208	142	110	184	35	106	92	140	0
INOPERATIVE	2	11	8	22	96	16	33	6	55	39	58	1
TOTAL	628	553	360	461	536	414	744	197	457	252	629	1

TABLE 9- Clearance/Relocation Trends

CLEARANCES	12/13	11/12	10/11	09/10	08/09	07/08	06/07	05/06	04/05	03/04	02/03	01/02
RELOCATION	421	132	221	382	337	289	177	244	245	934	808	50
REPAIRS	29	32	26	37	0	24	10	61	68	53	44	18
DISPOSAL	319	248	486	233	310	223	190	210	316	230	311	69
DEMOLITION	0	0	0	0	3	67	16	162	8	1	12	1
EQUIPMENT FABRICATION (OLIN)	34											
RENOVATION	0	56	55	57	27	1	20	18	15	29	4	1
RELOCATION TO STORAGE	0	6	0	0	0	35	10	1	1	0	40	0
TERMINATION	0	0	0	0	0	0	17	7	30	3	0	0
CLEAN	8	8	6	0	0	0	0	7	3	0	1	0
RETURN TO VENDOR	2	1	3	6	10	2	2	1	0	0	0	0
DECOMMISSION	34	31	22	10	18	10	16	4	0	1	0	0
TOTAL	847	514	819	725	705	651	458	715	698	1256	1190	147

TABLE 10 - DOT/IATA Shipping Trends

DOT/IATA SHIPPING	12/13	11/12	10/11	09/10	08/09	07/08	06/07	05/06
Aviation	0	1	1	0	3	0	0	5
Biological	3	6	11	64	5	48	47	40
Corrosive	0	22	4	0	0	0	1	0
DOT/ IATA	5	1	15	65	7	66	61	92
Dry Ice	32	22	37	128	54	25	46	51
Exempt	43	5	3	78	45	7	0	0
Infectious	7	3	4	56	3	1	2	10
TOTAL	90	121	75	391	118	155	158	209

TABLE 11 - Injury Trends

INJURY TYPES	12/13	11/12	10/11	09/10	08/09	07/08	06/07	05/06
NEEDLESTICK	3	31	28	26	22	18	11	25
SPLASH	6	10	8	11	12	8	11	11
BURN	2	5	11	4	4	0	0	0
CONCUSSION/ CONTUSION	6	26	16	31	27	21	9	12
LACERATION	40	36	35	30	30	21	16	1
STRAIN/ SPRAIN	28	18	4	8	8	3	17	2
SLIP/ FALL	30	38	35	17	28	24	11	3
INHALATION/EXPOSURE	14	14	3	4	4	6	3	0
BITE/STING	8	15	14	12	16	3	3	0
TOTAL	167	193	154	143	155	104	81	54

DEPARTMENT OF INJURY	12/13	11/12	10/11	09/10	08/09	07/08	06/07	05/06
DENTAL	36	36	28	11	26	21	13	25
NURSING	0	0	0	2	1	5	0	0
RESEARCH	37	38	42	20	20	32	8	12
CUSTODIAL	20	27	11	8	8	17	14	1
ARC	5	9	6	5	3	3	3	4
STAFF	18	23	14	12	12	8	3	6
PLANT	11	9	5	10	10	8	5	0
SECURITY	2	4	2	10	6	0	0	0
STUDENT	86	47	46	65	69	10	35	7
TOTAL	165	193	154	143	155	104	81	54

TABLE 12 - Incident Trends

INCIDENTS	12/13	11/12	10/11	09/10	08/09	07/08	06/07	05/06	04/05
EXPLOSION/FIRE	6	0	0	1	0	0	0	0	0
FOOD IN LABORATORY	1	0	1	2	0	0	0	0	0
SUSPICIOUS SUBSTANCE	2	3	2	3	0	0	0	0	0
UNSAFE CONDITIONS	2	2	0	1	0	0	0	0	0
ODOR	70	60	69	60	80	96	54	49	107
SPILLS/LEAKS	5	11	24	25	9	17	14	38	22
ALARMS	7	2	1	2	1	5	2	3	4
WASTE DISPOSAL	14	15	19	25	12	37	12	7	12
GAS ALARM	3	1	17	22	0	0	19	24	25
OTHER	4	5	17	12	22	16	12	13	49
EQUIPMENT ALARM	2	3	14	26	15	11	21	15	0
HOOD REPAIR	3	4	3	1	2	3	0	8	0
FLOOD	4	4	5	8	6	5	9	0	0
LEAK	2	1	1	0	9	2	4	0	0
MERCURY	2	8	2	10	0	11	6	0	0
TOTAL	127	131	199	230	190	223	245	271	306

TABLE 13 - Emergency Response Equipment
An action plan for maintaining proper readiness was developed using equipment as follows:

Kappler ER Decon shower (1)
MSA 5 minute escape pack (1)
Spill Containment kits, orange (7)
(4) Mercury absorbent and kit (3 lbs)
Spill filter strips (40-50)
Respirator Cartridges (20-30 pair)
Chemical classifiers
Hydrophyllic Spill Kits (12)
SCBA (2)
Mercury Vacuum (1)
Amphomag cartridge refill (1 container)
Biosystems air monitor hand test pumps (2)
Biosystems calibration kit (1)
Pelton communication headsets (2)
Kappler containment pool (1)
North 5 minute escape pack (1)
Spill Containment kits, white
Absorbents, Various (100 lbs.)
Drager kit and analyzer (2)
Waste water classifiers
Hydrophobic Spill Kits (8)
Mobile Decontamination Tent (1)
Drum leak kit (1)
Spill-X Guns (5)
Biosystems portable air monitors (2)
Biosystems air monitor electric pump (1)
Kappler pressure test kit (1)

Special equipment on-hand includes:

Gloves (Boxes)
Nitrile gloves (8)
Silvershield glove liners (20)
Viton gloves (1)
Silver shield gloves (1)
Butyl rubber gloves (1)
PVA gloves (1)

Suits (Boxes)
Tyvek suits, white (8)
Saranex suits (1)
Kappler training suits, blue (3)
Tyvek QC suits (3)
Kappler vapor suit "A" (2)
Polycoat overalls (35)

Foot Protection (Pair)
Tyvekpolycoated booties (8)
Tingley ER orange boots (2)
Hazmat boots (3)
Rainfair ER yellow boots (2)

Eye Protection (Each)
Face shields (2)
Safety glasses (5)
Flexi-Filters P100 (21)

Respirator (Each)

Full face respirator 3000 series (1)
N95 Respirator (80-100)

TABLE 14 -DISPOSAL SITE WASTE DISTRIBUTION

WASTE TYPE	MILLIS G35	ART STUDIO	DOA 990	CASC	WOLSTEIN	FARM	CORONER'S OFFICE	WEST QUAD
BOTTLES COLLECTED	3603	0	3446	-	878	0	24	12
REQUESTS PER SITE	304	1	345	0	108	0	1	1
CONTAINERS, FLAMMABLE	78	0	55	6	8	0	1	0
CONTAINERS, METHANOL/TISSUE	0	0	19	0		0	0	0
CONTAINERS, CORROSIVE	12	0	11	0	1	0	0	0
CONTAINERS, TOXIC	12	0	12	1	3	0	0	0
CONTAINERS, FORMALIN	0	0		0	1	0	0	0
CONTAINERS, PHOTO WASTE	0	2	3	0	0	0	0	0
CONTAINERS, MERCURY	3	0	7	0	1	0	0	0
CONTAINERS, MERCURY, LAMP	1	0	2	0	0	0	0	0
CONTAINERS, OXIDIZER	4	0	2	3	1	0	0	2
CONTAINERS, SAMPLES FOR TESTING	4	0	4	0	1	0	0	0
CONTAINERS, WATER REACTIVE	4	0	1	0	0	0	0	0
CONTAINERS, ORGANOMETALLIC	2	0	0	0	0	0	0	0
CONTAINERS, CAUSTIC LIQUID ALKALAI	6	0	6	2	0	0	0	0
CONTAINERS, SULFIDES	2	0	1	0	0	0	0	0
CONTAINERS, GAS CYLINDERS	1	0	2	4	0	0	0	0
CONTAINERS, ASBESTOS	1	0	0	0	0	0	0	0
CONTAINERS, NON-HAZARDOUS LIQUID	1	0	2	22	7	1	0	0
CONTAINERS, NON-HAZARDOUS SOLID	17	0	9	2	4	0	0	0

TABLE 15- RECYCLING

WASTE TYPE	CASC (# of units)	DOA (# of units)	Millis Science Center	WOLSTEIN (# of units)
BALLASTS (PCB) lbs	8041.6 lbs	0	0	0
BALLASTS (NON-PCB) (lbs)	1870 lbs	0	85 lbs	0
BATTERIES, NON-SPILLABLE (lbs)	234 lbs	25 lbs	45 lbs	0
BATTERIES, ALKALINE (lbs)	240 lbs	165 lbs	79 lbs	10 lbs
BATTERIES, NI-CD (lbs)	47 lbs	2 lbs	33 lbs	11 lbs
BATTERIES, LITHIUM (lbs)	0	4 lbs	12 lbs	3 lbs
BATTERIES, Mercury (lbs)	0	0	2	3 lbs
LAMPS, FLOURESCENT & UV(#)	0	31	6	3
LAMPS, MERCURY VAPOR(#)	0	62	3	4
LAMPS, Used X-RAY(#)	0	0	17	0