

**CASE WESTERN RESERVE UNIVERSITY  
DEPARTMENT OF ENVIRONMENTAL  
HEALTH & SAFETY (EHS)  
SAFETY SERVICE OPERATIONS  
ANNUAL REPORT 2010-2011**

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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, 2010 through June 30, 2011.

## **SUMMARY**

### **DEPARTMENTAL STRENGTHS**

The Safety Services Office (SSOF) operations 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. The 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.

### **ACCOMPLISHMENTS FOR 2010-2011**

Notable new accomplishments included:

- Hired new Executive Director
- Rebranded and renamed department to Environmental Health and Safety effective 7/1/2010, defined total new image along with new logo for new rebranding.
- Implemented a more effective committee structure to move initiatives forward with stakeholder input would facilitate better program development for EHS.
- Goal: The Safety Services Office will continue its efforts to work with responding agencies like fire, police, and health departments off campus to ensure coordination of our safety efforts. Enhancement of National Incident Management Training for our Employees will support this effort. The University has enjoyed good relationships in its safety efforts with Case University Hospitals. The Case Western Reserve University Safety programs will continue their stewardship of these programs to ensure that safety efforts with our neighboring and collaborating institutions continue to thrive.
- Implemented new campus-wide electronic waste (E-waste) Program, which includes a zero cost solution and 10,000 pounds of material removed per year.

## GOALS FOR 2011-2012

The SSOF will approach the following goals in 2011-2012.

- Implement CSHEMA benchmarking by 2012-2013 to determine how EHS measures up relative to other peer institutions on standard EHS benchmarks.
- Define strategic partner needs more clearly and look for ways to improve service.
  - Integration of Occupational Health programs across campus with EHS.
- Formalize working relationship with Facilities to improve project flow and efficiency. Implement EHS project checklist and provide input on safety features for possible University design standards.
- Complete reorganization of department by function while retaining cross training initiatives.
- Complete strategic plan for department and implement Professional Development Plans (PDP) for staff in alignment with department goals.
- Complete integration of OnSite
- Work with Human Resources to better share information and define training needs of new employees.
- EHS is limited by space for conducting training activities, holding staff meetings and other University-wide safety committee meetings where everyone can equally participate and be heard. Add Fire Safety Program to EHS
- Implement new Asbestos and Lead Project specifications and program changes
- Implement new Training Programs

## 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

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	12/4/2012	Infectious Waste
A20041118-0009	USDA High Consequence Agent Program and CDC Select Agent Program	2/17/2013	Animals/ Plants and Humans/ Bovine Spongiform Enchemlopathy (Prospective)
1801-0969-R00007	Ohio Department of Commerce	6/30/2012	Underground Storage Tanks

- ◆ EPA & OEPA RCRA Hazardous Waste Management - 8 sites

REGISTRATION #	LOCATION	EFFECTIVE DATE
OHD987033669	DOA 990	12/9/2006
OHD000812230	Millis G35	12/9/2006
OHR000112482	Art Studio (Greenhouse)	12/9/2006
OHG00061689	Bioenterprise (UCRC I)	12/9/2006
OHR000120147	Wolstein (WRB)	12/9/2006
OHD077757425	West Quad (Mt. Sinai)	12/9/2006
OHR000129148	Squire Valleevue & Valley Ridge Farms	12/9/2006
OHD004174660	Cedar Avenue Service Center (CASC)	12/9/2006

## 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)	Millis
Morley	Olin
Bingham	White
AW Smith	Rockefeller
Glennan	Pathology
Wickenden	Med East (Robbins)
Nursing	Dentistry
CCSB	
Wolstein Research Building (WRB)	Biomedical Research Building (BRB)

The following premises are registered as generators of hazardous waste:

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

## **SAFETY SERVICES PROGRAM: RESPONSIBLE PARTIES**

### **MANAGEMENT**

Safety Services provides support for the safe use of chemical, biological agents, physical, and construction concerns. The Department reviews procedures, responds to incidents involving chemicals and biological materials, and assesses the 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 Case Western Reserve University 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, Medical Waste), DOT, ODH, FDA, CDC, & USDA].

### **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 following audit recommendations.
- Reviewing laboratory activities that may be of concern to the public.

### **SUBCOMMITTEES**

The Chairpersons of the five subcommittees are ex-officio members of the LSC:

- 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 to ensure that specific guidelines are met. At present, the information for the exogenous protocols is included with the Pathogen Use Supplement C protocol.

PROTOCOLS	10/11	09/10	08/09	07/08	06/07	05/06
Chemical Carcinogen Use in Animals – Supplement B	35	25	26	24	23	32
Pathogen Use in Animals – Supplement C	18	31	45	19	29	49
Exogenous Substance (including Biohazardous Materials and Volatile Anesthetics) Administration - Attachment H	0	3	25	0	0	0
<b>TOTAL</b>	<b>53</b>	<b>59</b>	<b>96</b>	<b>43</b>	<b>52</b>	<b>81</b>

## LSC MEMBERSHIP

The 2010-2011 LSC membership is listed below. The President of the University appoints the voting members to 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: 10/1/2010 New Term Expires: 5/1/2012 Chairperson: 10/1/2010 New Term Expires: 5/1/2012	Thomas Gray, PhD. Asst. Professor Dept. of Chemistry Millis 418C Term Expires: 10/1/2011 New Term Expires: 5/1/2014	David Samols, PhD. Professor & Chairman of CASE Biosafety Committee Dept. of Biochemistry Research Tower 400-8 Term Expires: 10/1/2010 New Term Expires: 5/1/2014
Fady Faddoul, PhD Associate Professor AEGD Dental School 1 <sup>st</sup> Floor Term Expires: 10/1/2010	William Durfee, DVM Asst. Professor & Director Dept. of Veterinary Research Services Animal Resource Center Wood G48 Term Expires: 10/1/2010 New Term Expires: 5/1/2014	Gregory Tochtrop, PhD Assistant Professor Chemistry Millis 418C Term Expires: 10/1/2010 New Term Expires: 5/1/2014
W. David Sedwick, PhD. Professor, Dept. of Medicine & Director of EHS Radiation Safety Service Building, 1 <sup>st</sup> Floor Room 118 New Term Expires: 5/1/2014	Christina Hirsch, PhD Associate Professor Dept. of Infectious Disease Robbins 202 Term Expires: 10/1/2010 New Term Expires: 5/1/2014	Andrea Romani, PhD. Asst. Professor Dept. of Physiology/ Biophysics Med East 528 Term Expires: 10/1/2011 New Term Expires: 5/1/2014
Lance Vernon Senior Instructor Dept. of Biological Sciences Dental School 3540 Term Expires: 5/1/2014	Irene Lee, PhD Associate Professor Dept. of Chemistry Millis G24A Term Expires: 5/1/2014	

### EX-OFFICIO MEMBERS

Chuck Hart, PhD Executive Director EHS Service Bldg. 1 <sup>st</sup> Floor	Carol Grove Director of UH Safety Dept. Service Building 6 <sup>th</sup> Floor  Left CASE 6/30/2011	Kenneth Klika, PhD Asst. Dean & Director of Facilities Management & CASE School of Arts & Sciences Crawford 718
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Marc Rubin, MS Assistant Director & Chemical Safety Officer of EHS Safety Services Service Building 1 <sup>st</sup> Floor	Laurie Dudik, PhD, JD Manager of Facilities & Technical Support RC Electronic Design Center Bingham 112	Kimberly Volarcik Director of Research Administration Sears Library
Felice Porter Asst. Director/Asst. Radiation Safety Officer EHS Quality Assurance Specialist Service Building 1 <sup>st</sup> Floor	Heidi Page Asst. Director Research Administration Sears Bldg. 661	Jill Stanley Assoc. Dean Space & Facilities Planning Sears Tower 2503
Melissa Braskie Director of UH Safety Dept. Service Building 6 <sup>th</sup> Floor Start – 6/30/2011		

### SUPPORT STAFF

Tom Merk Asst. Director EHS Service Building 1 <sup>st</sup> Floor	Jason May Department Asst. - EHS Service Building, 1 <sup>st</sup> Floor
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During the 2010/2011 fiscal year covered by this report, the Committee terms were allowed to expire. Under the direction of our new Executive Director, Chuck Hart, the Laboratory Safety Committee was revived with new membership and met on one occasion. Major topics considered by the LSC included:

- ◆ Introduction of Chuck Hart as new Executive Director of EHS
- ◆ Introduction of Zach Schweikart, Industrial Hygienist, & James Dahle, Fire/Safety Specialist for EHS
- ◆ Committee members and EHS staff introductions
- ◆ Fire Safety integration into EHS
- ◆ LSC comments regarding additions to the Fire Safety program
- ◆ Role of LSC
- ◆ Open discussion
- ◆ Audit process
- ◆ LSC agenda for 9/21/2011
- ◆ Laboratory safety issues



## **SAFETY SERVICES OFFICE (SSOF)**

### **STAFFING**

The SSOF operates with the following staffing:

Director (1)	Asst. Director/Asst. RSO/Quality Assurance Specialist (0.5)
Department Assistant (1)	Specialist Positions (3)
Department Administrator (0.5)	2 <sup>nd</sup> Shift Specialist (1)
Student (1)	Facility & Construction Safety Specialist (1)
Executive Director (0.5)	Industrial Hygienist (1)

The new Executive Director position was filled by Chuck Hart in December 2010. The new Industrial Hygienist position was filled in June 2011. We no longer have the 2<sup>nd</sup> Shift specialist position. It was eliminated due to budget issues.

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.

### **EHS EMAIL**

The EHS Email ([does@case.edu](mailto:does@case.edu)) has become a frequently used safety resource. Since its inception, the number of inquiries and safety concerns reported from Case Western Reserve University personnel averages 11 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. They may call 866-483-9367 or go to <https://www.caseintegrityhotline.com>. They are encouraged to provide the date, time, location, and any other pertinent information concerning the incident.

### **EHS WEB SITE**

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. Table 3 of the Appendix illustrates updates made to the Website in 2010-2011 and Table 4 of the Appendix enumerates services provided on-line by EHS.

### **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:

- Revisiting UCLA: What We Can Learn from Their Mistakes Summer Safety Reminder: Proper Attire in the Laboratory
- Fume Hood Safety
- A Quick Refresher Tutorial Proper Chemical Labeling
- The Essentials 12 Safety Tips for Using an Autoclave
- Fall Preparations—Is Your Lab Ready for the Fall Semester?
- A Summer Safety Reminder—Proper Attire in the Labs
- Signs, Labels, and Markings: A Few Basic Reminders
- September is Safety Month at CWRU
- Hood Repair Status Reminder
- Eye Injury Prevention: Knowing the Basics
- Holiday Decorations: Play It Safe
- Thinking Ahead—Planning Each Lift
- Laboratory Management
- Access and Security—A PI's Responsibilities
- e-Waste—Electronic Equipment Disposal
- Back Injuries: A Quick Reminder List
- Acetylene Regulator and Cylinder Safety
- Why Wear a Laboratory Coat?
- Controlling Laboratory Ergonomic Risk
- Fume Hood Safety Tutorial
- First Aid Reminders for Biological Hazards
- Safety with Chemicals: A Short Precautionary Checklist
- Meet our new Executive Director!
- When does 'messy' become 'unsafe'?
- Recycling Lab Plastics
- Lab Doors
- Where is EHS?

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.

## **EMPLOYEE COMPLIANCE COMMITTEE**

The Employee Compliance Committee (ECC) is comprised of representatives from departments responsible for hiring laboratory personnel (Human Resources, Kelly Temporary Services, Nursing, Dental, Engineering, Arts/Sciences, Health Services, and Medical School), The Committee was formed to improve tracking of University employees to ensure that training and safety programs were comprehensively implemented for all members of the University community. The ECC is being reviewed by the new Executive Director and did not meet this year although Table 5 of the Appendix illustrates compliance Issues addressed by this Committee in the past.

## **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. As part of this program, the Case faculty members were contacted on an individual basis and were provided with information concerning safety.

ORIENTATION	10/11	09/10	08/09	07/08	06/07	05/06	04/05	03/04	02/03
New Employees	504	474	483	557	380	561	750	715	565
New Faculty	72	70	46	99	85	63	56	32	20

MONTH	NEW EMPLOYEES
7/2010	47
8/2010	43
9/2010	32
10/2010	27
11/2010	52
12/2010	48
1/2011	48
2/2011	44
3/2011	33
4/2011	28
5/2011	53
6/2011	49
TOTAL	504

## TRAINING

A major emphasis has been placed on expanding and refining SSOF training programs. Over the past year, the SSOF has made significant progress in contacting individuals requiring new worker training and annual retraining. This training is Web or lecture-based using PowerPoint, video and demonstrations at the EHS training center and various campus locations as requested by the group being trained. Both initial and retraining classes are offered on a weekly basis for most programs. Historical Training trends are illustrated in Table 6 of the Appendix.

There were several documents, manuals, and modules that were created and updated this year including:

- Machine Guarding
- Check training online
- Summer Student Training
- New MSDS Program
- Biological Safety Manual

## SPECIFIC TRAINING PROGRAMS

### HAZARD COMMUNICATION TRAINING (HAZCOM)

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 provided HAZCOM training included Housekeeping, Dental, Nursing, Grounds, ARC, Facilities, Security, and Shipping/Mailroom. Groups receiving this training may only occasionally

enter research areas, but none-the-less may encounter hazardous situations or hazardous materials exposures if not properly alerted.

#### CHEMICAL SAFETY AWARENESS TRAINING

Several general awareness classes for target groups such as the Animal Resource Center (ARC) 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, 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 (BSL3) TRAINING

Extensive training is required for Select Agents used on the University's campus. A training course was created for individuals who enter the BSL3 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.

## RESPIRATOR TRAINING

Special training sessions for Facilities Services, Animal Resource Center (ARC), and BSL3 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 BSL3 and ABSL3 facilities.

## VEHICLE SAFETY TRAINING

Vehicle Safety Training is presented on an as needed basis. EHS conducted 28 Drivers Safety Training classes for Case employees and the summer help staff, training a total of 90 people.

## FACILITIES SAFETY TRAINING

Training for Facilities Service personnel is conducted on a scheduled basis. Topics include:

- 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

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

## 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. Specific training includes confined space, hot work, tow motor, and ladder safety.

## 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	RBC
Rockefeller	Service Building	Wearn
White	Wickenden	UCRC II
VA Hospital	MetroHealth	NASA
CCF- Walker	Wood Research Tower (RT)	West Quad (CCSB)
Wolstein Research Building (WRB)		UCRC I (Bio-Enterprise)

## LABORATORIES

The University Safety Service programs monitored approximately 2800 laboratories in 38 laboratory buildings on campus. These laboratories are located in four hospitals, the Case Western Reserve University Quad and the Medical, Nursing, and Dental School facilities, as well as offsite locations.

Case Western Reserve University'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 Service's facilities and equipment are located in the Service Building (1<sup>st</sup> Floor), Medical School (DOA990), Millis Science Center (G35) and the Wolstein Building (1103).

## PROGRAM OFFICE:

### Service Building (1<sup>st</sup> 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 on-line database and training materials. It also provides direct access to library services and campus maps during staff meetings, and emergency incident exercises or responses. This room also houses the campus Emergency Operations Center (EOP).

All EHS personal computers (PCs) are being backed up onto a terabyte array. The Carbonite backup service is currently used for two EHS Servers (EHS, onsite-server). The web server (Aurora) itself is backed up, and additionally the files are copied locally on magnetic storage and periodically backed up onto optical storage discs.

The following maintenance was accomplished this fiscal year:

#### Hardware Maintenance

- Repaired about 25 workstation hardware problems
- Purchased and set up 3 new computers (2 workstations, 1 netbook)
- Set up 5 existing computers for new users
- Repaired failed server
- Repaired approximately 15 other hardware issues (workstations, phones, printers)
- Fixed approximately 30 IT issues in the office

#### Software Maintenance

- Repaired about 200 workstation software problems
- Automated online bloodborne pathogen training
- Major data validation program, correcting about 3000 entries in the database
- Began medical surveillance module in OnSite
- Website updates
- Corrected approximately 2000 entries for Lab Safety training
- Prototyped new training system in JavaScript/Articulate
- Fixed approximately 170 IT issues in the office
- Published first newsletter

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

#### Chemical Laboratory:

##### Service Building (1<sup>st</sup> Floor):

The SSOF is located in the Service Building on the 1<sup>st</sup> 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 1<sup>st</sup> floor parking area of the CASE School of Medicine, 1<sup>st</sup> 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, and 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 also maintains ABSL-3 laboratories for Select Agent research and ABSL-3 facilities 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 15 industrial hygiene, respirator, ventilation, noise, and lighting instruments are maintained. Table 7 of the Appendix lists instruments maintained for the Safety Service Program.

Twenty (20) in-house air monitor calibrations were performed during July 2010 to June 2011. With the loss of the night shift position, calibrations are performed during normal working hours.



## **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 DOT and IATA for transport of goods, all EPA RCRA programs for environmental chemical releases and waste disposal, and all OSHA programs for employee safety.

### **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.

CASE has more than 413 PIs authorized to use chemical and biological materials in 2805 laboratories, rooms, and facilities. 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.

Case Western Reserve University 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 Case University Hospitals, The Cleveland Clinic Foundation, Metro Hospitals, 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), and Veterans Administration (VA) Hospitals through cooperation of the safety offices at these institutions. Squire Valleevue Farm and Valley Ridge Farm, 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 2010/2011 are presented in Table 8 of the Appendix.

Safety problems found during the 2010 inspections were followed-up and audited to increase compliance. In 2011, 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 on-line 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 upwards to 3,000,000 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	10/11	09/10	08/09	07/08	06/07	05/06	04/05	03/04	02/03	01/02
CHP	403	283	289	230	194	159	42	21	24	7
ECP	395	328	280	227	49	33	35	19	23	4
TOTAL	798	611	569	457	243	192	77	40	47	11

### **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 MSDS information for chemicals used by pregnant workers. Three workers completed the Declaration of Pregnancy Form this fiscal year and their laboratory protocol was reviewed and adjusted when necessary.

### **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 provided analysis of Short Term Exposure Limits (STEL) and Time Weighted Average Permissible Exposure Limits (TWA-PEL). Anatomy laboratories used virtual examination of the body over the past year. Formaldehyde monitoring was performed in Robbins Building Gross Anatomy rooms: E20, E329, and E330. Measured exposure levels continue to remain below the OSHA permissible exposure limit (PEL) and short term exposure limit (STEL).

## **INDUSTRIAL HYGIENE**

### 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

Nine 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 is 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. Due to budgetary constraints, this program was not utilized this year.

### 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, enflurane, 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, including the proper use of controls
- Proper maintenance of equipment to prevent leaks
- Periodic personnel exposure and environmental monitoring to determine the effectiveness of the overall waste anesthetic gas control program. The Table below shows locations in which specific gas monitoring was carried out.

ANESTHETIC GASES/ VAPORS	10/11	09/10	08/09	07/08	06/07
AIR	0	0	0	0	1
CARBON DIOXIDE	0	0	0	0	1
DIETHYL ETHER	0	0	0	0	1
ENFLURANE	0	0	0	0	1
ETHER	0	7	7	7	2
ETHYL CARBAMATE (URETHANE)	0	6	6	6	0
HALOTHANE	0	9	9	9	3
ISOFLURANE	10	168	168	168	44
METHOXYFLURANE	0	3	3	3	0
NITROUS OXIDE	0	5	5	5	4
TOTAL	10	198	198	198	57

The Table above shows that Isoflurane is the anesthetic gas in predominate use. Researchers use anesthetic gas in the ARC and in their laboratories. Ten (10) anesthetic gas setups in the laboratories were inspected. The researchers that use anesthetics gases are now identified through their IACUC protocol. Due to budgetary constraints and reduced personnel, this program was under-utilized this year.

### ASBESTOS MONITORING

The human respiratory system has basic mechanisms to filter the air we breathe. However, even with our 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. It cannot be seen in air. In terms of how much asbestos is too much, OSHA has established an eight-hour time-weighted average (TWA) permissible exposure limit (PEL) for employees of 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 exceeding these exposure levels need to implement engineering or work practice controls to reduce the 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-the asbestos particles physically counted-by an analytical laboratory. The protocol the laboratory must follow is also detailed in Appendix A.

Asbestos monitoring is addressed on a per case basis. EHS and/or consultants sampled and analyzed multiple asbestos projects throughout the campus and CASE Farms. An average of 150 requests was made for 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, & Housing or arrangements were made by EHS to have the area remediated by an approved asbestos contractor.

### BIOAEROSOL MONITORING

The Semi-Annual Bio aerosol Monitoring Project was suspended since historical data revealed that this program could be curtailed as a cost savings measure. Due to budgetary constraints, this program was not utilized this year.

Monitoring continues to be conducted on a case-by-case basis. There was 1 mold assessment done for one building. All samples that tested positive for mold growth were abated.

Historical bio aerosol sampling results were analyzed to study changes in the patterns of bacterial and fungal growth in different seasons of the year. These sampling strategies and consultation with the construction teams about abatement and mold remediation have resolved ongoing mold growth problems. For all projects impeded by mold growth problems, a request was submitted to Customer Service or arrangements were made by EHS to have the area remediated by an approved contractor. There were 50 projects that were assessed for mold. All samples that tested positive for mold growth were abated. The increase in mold assessments is due to the record rainfall and subsequent floods in several campus buildings.

## 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 behavior 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. EPA announced these three 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 air sample 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 CASE Construction Project Managers or arrangements are made by EHS to have the area remediated by an approved contractor. There was an average of 150 requests for sampling made for CASE-owned residences.

## **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 CASE laboratories, is limited largely 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 respiratory program was further expanded as part of pandemic influenza planning for the University to include Police, Security, BSL3, and Custodial.

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.

Medical evaluations were completed for 305 employees. Respirator Safety Training was attended by 184 employees. Among the 184 trained employees, only 175 were fit-tested for a respirator. Those workers that do 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 9 of the Appendix.

## **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 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 HVAC work 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. Seventy-five (75) work order requests were initiated with Facilities for chemical hoods that were performing below par and needed repair. Monitor repair is still one of the biggest issues concerning the chemical hoods. The Vortex II hoods on the 4<sup>th</sup> floor of Millis needed all the sash bearing replaced due to chemical deterioration. Monitoring of all Vortex hoods for this failure is being maintained.

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 360 chemical hoods, while ASHRAE 110 tests were done on only 7 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.

In January of 2011 a new schedule was implemented to meet the program objectives and the midyear tally includes 284 fume hoods certified, 4 new hoods ASHRAE tested and 43 repairs requested.

Additional 2011 program innovations are being evaluated which include providing vanometers to researchers whose fume hoods are without monitors, local calibration of installed hood monitors, guidelines posted on fume hoods for each monitor type and ASHRAE testing for only new or repaired hoods. Chemical hoods located in off campus facilities are maintained by the respective building owners and assisted by EHS when needed or requested.

Continuation of the Energy Platform between EHS and Facilities has been successful in that more faculty, staff and students are attentive to the Shut the Sash program. This program is especially supported by both our Chemistry and Macromolecular Science and Engineering buildings as evidenced during annual testing with the hood sash being closed when not attended.

The statistics for the hood certifications are shown in Table 10 of the Appendix.

**BIO SAFETY CABINETS AND LAMINAR FLOW HOODS**

There are approximately 450 biological safety cabinets and laminar flow hoods on campus. Biosafety cabinets (BSC) and Laminar Flow hoods were certified through a contracted company, Laboratory Certification Services (LCS). The laminar flow and Biosafety cabinets are recertified at a cost of \$95/laminar flow hood and \$125/hood/biosafety cabinet. PIs are notified annually to re-certify their hoods. 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	10/11	09/10	08/09	07/08	06/07	05/06	04/05
RECERTIFY	341	326	253	181	234	274	142
REPAIR	3	6	88	51	25	31	16
TOTAL	344	332	341	232	259	305	158

**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 the existing location 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 CASE, and Safety Clearances. There were 819 Clearance forms issued, which covered clearance of approximately 2000 pieces of equipment. This equipment was either moved or discarded during the 2010/2011 fiscal years. There were 54 Primary Investigators (PIs) representing more than 108 research laboratories that relocated for different purposes such as decommissioning, renovation, relocation or termination. The results are shown in Table 11 of the Appendix.

EHS specialists accrue many man-hours assisting researchers in cleaning out their laboratories including: moving, decontaminating, recycling, and discarding equipment and materials. These acts 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 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. See Table 12 of the Appendix for the DOT/ IATA Shipping Trends. 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 3 special training sessions for Exempt Human Specimen shipment and 37 for Dry Ice shipment using the training materials. There were a total of 75 packages of dangerous goods sent from CASE 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 14 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 15 of the Appendix.

With the loss of the night shift position, the number of evening incident responses has continued to decrease.

## **EMERGENCY RESPONSE PROGRAM**

Following the 911 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 level is raised from red 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.

Collaboration with Case 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 Hospitals. With the heightened post 911 security levels and in response to events that have taken place at CASE, the need for full-scale emergency response compatibility is mandatory. A committee has been assembled to plan exercises leading to an emergency scenario involving CASE personnel and its City and regional partners in Police and Fire Departments, and Emergency Services. Working with Protective Services and the CASE 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 16 of the Appendix illustrates equipment that supports response readiness at Case Western Reserve University 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.

## **BIOLOGICAL SAFETY**

### BSL-3 FACILITIES

Currently there are two Biological Safety Level-3 (BSL-3) facilities for prion research (one for molecular and biochemical research, and one for animal research); a specifically equipped BSL-2 facility for prion research, as well as one BSL-3 facility for other 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.

### SELECT AGENT PROGRAM

In the aftermath of September 11, 2001, the Patriot Act and other regulations were enacted to protect against bio-terrorism. Two federal agencies are under its auspices, the Center for Disease Control (CDC) and the US Department of Agriculture (USDA). The Departments of Health and Human Services (HHS) and the USDA have promulgated rules in the Federal Register governing facilities that possess, use, or transfer select biological agents or toxins that became effective on February 7, 2003.

A specific Biosafety Committee was formed as an oversight committee. The Responsible Official (RO) is the Vice President of Campus Planning and Operations at the University. The Assistant Responsible Official (ARO) is the Biological Safety Officer for EHS. The Biological Safety Officer (EHS Director of Safety Services) also sits on the following committees: Select Agent Committee, ABSL3 Committee, Institutional Biosafety Committee (IBC), the University Compliance Committee, and 2 BSL-3 Advisory Committees. The Biological Safety Officer also sits on the IACUC and IBC Subcommittees.

One select agent on campus is currently registered with the government agencies. Seventy-two (72) individuals, involved in this program, underwent background checks and fingerprinting carried out by the Federal government and is authorized to enter the facilities. The increased number of persons involved in the program is due to an inclusion of those users that use the facility yet are not directly using the select agent. There are three levels of security controlling select agent access in the BSL3 select agent facilities.

- Card swipe entry security at the entrance of the laboratory
- A second card swipe system for the isolation laboratory
- A third locked location for storage of BSE materials within the laboratory

An internal audit of the files is conducted once a year. The importance of the information requires that the RO and ARO be audited in this fashion to add a level of comfort for those ultimately responsible.

Each researcher generates an electronic sample log. The manuals for the program require annual audit, as do the SOP's and forms for the program. These documents have been reviewed and updated.

## SELECT AGENT COMMITTEE

The Select Agent Committee is comprised of Select Agent Users, the CASE Biological Safety Officer, the RO and the ARO from EHS, the EHS Executive Director, the Director of Animal Facilities, and the ARC Veterinarian. This Committee is charged with the responsibility for maintaining regulatory compliance with regard to use, handling, and disposal of Select Agents within the University and associated facilities. This committee reviews applications, develops procedures, and guides researchers in use and disposal of Select Agents.

## **PHYSICAL SAFETY**

### 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.

### 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.

### **ERGONOMIC EVALUATIONS**

Ergonomic assessments are conducted in response to employee's requests. Forty-two (42) individual office assessments were completed in 2010-2011. Questionnaires were completed and suggestions were made on how individuals can improve areas through implementation of

good ergonomic work practices and information was provided to help them understand these practices. Most suggestions were accepted and implemented with minor impact on Departmental budgets. Other ergonomic equipment such as pens, wireless computer mice, eyeglasses, and stress balls were distributed during assessments and at one safety fair.

#### 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 119 CASE 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 year, but are scheduled for 2012.

#### 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 year.

#### 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.

#### 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 fourteen (14) shutdowns of the fan exhaust in Medical School, BRB, RT, Millis and WRB. All exhaust fans 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. Sixty-four (64) permits for entry were issued this year for CASE employees and outside contractors working on CASE 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. The permit is issued for a certain time period, which is normally no more than one week.

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. One hundred twenty (120) permits, both long-term and short-term, were issued to CASE employees and outside contractors. EHS reviews only Contractor Hot Work permits since the amount of campus construction decreased and the Facilities Department oversees CASE maintenance projects requiring hot work permits.

## **CONSTRUCTION SAFETY**

An EHS representative oversaw the Hazardous Materials Waste Collection Program of Construction Debris Recycling for Fluorescent Bulbs and Ballasts, conducted weekly Construction Safety Walkthrough Inspections on projects throughout campus, and participated

in the Construction Managers Weekly Project Meetings on the projects listed in Table 17 of the Appendix.

### CONTRACTOR OVERSIGHT

The Plant Safety Specialist conducted weekly Construction Safety walkthrough inspections on projects throughout the campus for outside contractors and CASE 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. CASE 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 contractors and personnel that carry out construction on CASE property. There were 45 classes for 60 different outside contractors conducted and this program informed one hundred thirty-seven (137) outside contractors.

### **EPA AND WASTE DISPOSAL PROGRAM**

#### ENVIRONMENTAL RELEASES

The Northeast Ohio Regional Sewer District (NEORS) 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. CASE's sewer releases were in compliance with both federal and state regulations. In the past fiscal year, the report for January through December 2010 was filed on February 2011.

Overall, waste collection at CASE continued to increase during the 2010-2011 fiscal year. The ability of the Chemical Analytics contractor to perform de-activation of Peroxides, Picric acid, and Perchloric acid reduces the intrinsic cost of disposing of this material and represents a significant cost savings. Most importantly, reduction in hazard through on-site performance of waste handling complies with OSHA requirements.

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 2431 Hazardous Waste Forms from 2010-2011 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 CASE is treated by autoclaving before landfill disposal. Autoclave Certification was first completed for disposal of biohazardous waste in November of 2003. 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 1044 loads was treated per month equaling 12,630 cubic feet of infectious waste. Infectious waste treated in the SaniPak Autoclave equaled a total average poundage of 6,000 and was transported by CASE Custodial to the American Landfill in Ohio. Healthcare Waste Solutions (HWS) incinerates the remaining waste.

### INFECTIOUS STATE MEDICAL WASTE

Healthcare Waste Solutions (HWS), the waste disposer, incinerated all Regulated Medical Waste through incineration or autoclaving. 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 5,679 containing a total 137,437 pounds of waste for the fiscal year.

### NON-INFECTIOUS ANIMAL CARCASSES

Non-infectious animal carcasses are being autoclaved and buried 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 583 boxes disposed containing a total 20,451 pound of carcasses for the fiscal year.

### RECYCLING PROGRAM

The Recycling Program for chemical solvents was terminated in October 2001; however, recycling of a number of materials continues to be carried out successfully for materials collected from the main campus Complex. Currently the following types of waste are recycled:

- Lead
- Paint
- Batteries
- Computer monitors (weigh up to 30 pounds and contains 8 pounds of lead)
- Computers
- Equipment (Electronic)
- Fluorescent Bulbs

An average of twenty (20) Bills of Lading was collected for recycled material. Facilities is now handling the collection and disposal of ewaste. EHS is the oversight for this program and guides the process with regards to regulatory matters.

### WASTE FACILITIES

CASE Waste Facilities are used to segregate and prepare waste for disposal. The different waste streams include aqueous waste and dry solid waste. Reducing the volume of waste to be

disposed remains a continuing aim of the waste program promoted by the SSO. 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

Hazardous waste rooms are used as central collection points for what the EPA defines as a site. CASE presently has 8 sites. CASE also operates 90-day waste accumulation areas that are inspected on a weekly basis. The accumulation areas are located at DOA990, Millis G35, and WRB 1103.

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 18 & 19 of the Appendix.

**MANAGEMENT CENTER WASTE DISTRIBUTION**

MANAGEMENT CENTER	ARTS/ SCIENCE	ENGINEERING	DENTAL SCHOOL	MEDICAL SCHOOL
WASTE COST	\$69,944	\$51,209	\$4,447	\$378,435

WASTE COST	10/11	09/10	08/09	07/08	06/07	05/06	04/05	03/04	02/03
ARTS/ SCIENCE	69,944	47,644	112,782	105,197	54,950	47,250	41,746	51,961	112,064
ENGINEERING	51,209	58,312	34,019	56,876	41,808	28,485	64,292	37,952	71,723
DENTAL SCHOOL	4,447	4,633	0	5,473	4,452	4,735	4,238	2,335	5,475
MEDICAL SCHOOL	378,435	446,712	166,055	129,625	431,601	547,094	471,374	413,696	138,999

## REGULATORY INTERACTIONS

### EPA/ RCRA INSPECTION

There were no violations noted during the Comprehensive Quarterly Inspections of the Autoclave Unit conducted by the Environmental Protection Agency/Resource Conservation & Recovery Act (EPA/RCRA) that took place by Cleveland Health Department during 2010/2011.

### OSHA COMPLAINTS

No Occupational Safety & Health (OSHA) complaints were received in 2010/2011.

## AUDITS

The Laboratory Safety Committee was reorganized this year and did not conduct audits of Safety Services' activities this year.

AUDITS	10/11	09/10	08/09	07/08	06/07	05/06	04/05	03/04	02/03
Chemical Hygiene and Exposure Control Plans			X		X		X		X
Hoods			X		X		X		X
Bloodborne Pathogens			X		X		X		
Industrial Hygiene & Indoor Air Quality			X		X		X		X
Training		X	X		X		X		X
Respirator			X		X		X	X	
Clearances		X		X		X		X	
Regulated Chemicals		X		X		X		X	
Waste				X		X		X	
Incidents		X		X		X		X	
Website		X		X		X		X	
Inspections		X		X		X		X	
Protocols			X			X		X	
Hazardous Material Shipment & DOT Training			X	X	X		X		
Facilities				X		X		X	
Licensing			X			X			
Select Agent			X	X		X			
TOTAL	0	6	10	9	7	10	7	9	4

## EHS INTERNAL AUDITS

In addition to audits conducted by the Laboratory Safety Committee, the Department's Quality Assurance Specialist reviews all programs and records on a periodic basis, and assists with resolving compliance issues in the Safety Services Office. Internal audits are conducted to support program effectiveness and efficient operation. These audits have resulted in several program enhancements.

## INTERNAL AUDITS

Chemical Hygiene Plans	Exposure Control Plans
Training	Chemical Hoods
Biological Safety Cabinets	Bloodborne Pathogens
Hazard Communication Plan	Industrial Hygiene
Indoor Air Quality	Respirators
Clearances	Regulated Chemicals
Hazardous Waste	Incidents
Website Accuracy	Inspection Reports
Research Protocols	Infectious Material Shipment
DOT Shipments	Laboratory/ Waste Facility
Select Agents	License/ Registration
Liaison Program	Physical Safety Programs
Plant Safety Programs	SOP Reviews

This year, in response to internal audit findings, Safety Services continues to improve its procedures and programs.

## MINORS, VOLUNTEERS, VISITORS AUDIT

### Comments

- Guidelines were completed and distributed in 9/2008.
- In 2009, 71 volunteer forms were received.
- In 2010, 87 volunteer forms were received.
- In 2011, 123 volunteer forms were received.
- All records are current and program run well.

## 2010/2011 INSPECTIONS AUDIT

### Comments

- 2009 Inspection report return was 95% completed.
- 2010 Inspection report return was 96% completed.
- 2011 Inspection report return was 55% completed.
- Inspectors contacted delinquent researchers.
- Repeat violations decreased from average 4 to 3
- Due to decrease in staff, off campus inspections were not done.

## CHEMICAL HYGIENE & EXPOSURE CONTROL PLANS

### Comments

- 103 of 403 Exposure Control Plans are past due
- 101 of 403 Chemical Hygiene Plans are past due
- Chemical Hygiene & Exposure Control Plans were requested for all new researchers once notified through Human Resources and annual inspections.
- Training of researcher and personnel was verified once plan received.
- Most plans were updated annually.
- All protocols were checked to ensure both plans and training were current.

## BIOHOODS

### Comments

- 107 of 446 biohoods that were not tested this year.
- Researchers are notified of past due biohoods through inspection and email reminders.
- Researchers submit forms for biohood certification and repair.

### SSOF Response

No response required.

Prepared by Felice Thornton-Porter on 10/30/2011.

## APPENDIX

**TABLE 1 - Training and conferences attended in 2010-2011 included:**

- OSHA Respirator Fit Testing Training – Ohio BWC
- Biosafety Cabinet Technology & Introduction to Certification Training
- HVAC Systems and Laboratory Design Course
- ASHRAE 110 Testing Workshop
- DOT Certification Course
- Certified Industrial Hygiene Management Course – CIHM
- NIH – Information Security Training
- CSHEMA – Campus Safety Health & Environmental Management Association
- ABSA – American Biological Safety Association
- Laboratory Safety by Design
- RCRA Training

**TABLE 2 - All staff members received:**

- OSHA 30 hr. Training
- OSHA Hazardous Waste Operations
- OSHA Hazardous Materials Transportation
- FEMA Courses – 100b, 200b, 700a, & 800b
- 8-hour RCRA Hazardous Materials Manager Refresher Certification
- The Hazardous Waste Operations and Emergency Response Standard (HAZWOPER) Certification
- DOT/iata

**TABLE 3 - EHS Web Page Updates:**

- Baxter Safety Alert
- Triad Alcohol Swabs Recall
- New MSDS Program
- Machine Guarding
- Check Training Online
- UV Training
- Summer Student Training

**TABLE 4 - EHS has provided researchers with the following Online services:**

- Newsletters
- Check Training Online
- Safety Training Updates

TABLE 5 - Compliance Issues Addressed by Employee Compliance Committee (ECC)

YEAR	COMPLIANCE ISSUES
2011	No meetings scheduled due to EHS review and reorganization.
2010	Eating/ Drinking/ Smoking/ Personal Protective Equipment Issues Emergency Scenario for Senior Administration held 1/7/2010 Demonstration of new features on DOES Website Minors/ Volunteers/ Visitors Guidelines Temporary Employment Human Resources Supervisory Briefing of Employment Legal Updates Review of DOES Annual Reports Laboratory Safety Inspections – Phase I Human Resources Briefings of Documenting Performance/ Behavior Problems HP Assist Laboratory Safety Inspections – Phase II Biohood Audit Cylinders DOES name change to EHS Executive Director Resignation
2009	Distribution of both Radiation Safety & Safety Services Annual Reports DOES conducts Ergonomic Assessments CASE employees at the VA Hospital Kelly Services employees at the VA Hospital Rabies vaccine shortage DOES/UH Safety Roundtable – 1/28/2009 OSHA final rule for Personal Protective Equipment (PPE) – 12/12/2008 DOES Strategic Plan Research of Policy on Reproductive Protection Employee Relations will assist Bureau of Workers Compensation claims Kelly Services will send Kelly employee injury log to DOES for tracking Animal Resource Center inspection on 2/24-26/2009 by AAALAK Accreditation went well
2008	New DOES Safety Inspection Enforcement Policy New DOES Policy on Minors, Volunteers, & Visitors 2008 DOES Laboratory Inspection Schedule Phase 2 – Satellite CASE Facilities Kelly Services reviewing new training modules for Kelly employees Irradiators personnel must now be fingerprinted CLIPS Program has six students for the Summer List of CASE employees working at NASA New Job Exposure Checklist New Faculty Checklist 2008 DOES Laboratory Inspection Schedule Phase 3 – Medical Complex DOES Peer Review on 9/29-30/2008 went well Research Administration Department Reconstruction

TABLE 6 - Historical Training Trends

TRAINING	10/11	09/10	08/09	07/08	06/07	05/06	04/05	03/04	02/03
Hazard Communication	2191	601	791	481	197	118	276	272	52
Laboratory Safety	3880	2602	2581	2032	2364	1884	1754	753	940
Regulated Chemical	2962	1375	1163	868	1720	0	0	0	0
Bloodborne Pathogen	3573	2093	2036	1396	1400	1330	1001	859	910
Respirator	184	483	481	177	44	103	73	118	70
Vehicle Safety	164	149	118	94	156	98	128	135	0
Fire Extinguisher	50	0	0	0	75	75	72	60	0
Plant	710	600	600	600	70	240	280	282	0
BSL3	86	78	78	30	29	38	39	49	0
DOT/IATA Shipping	75	391	118	169	55	168	26	15	4
Contractor	137	356	330	317	328	422	118	190	80
Special Classes	327	910	902	890	395	396	207	195	90
Other	537	2002	1181	0	0	0	0	0	0
TOTAL	14876	11640	10379	7054	6833	4872	3974	2928	2146



TABLE 7 - Calibrated Instruments

INSTRUMENT	MODEL	SERIAL #	FREQUENCY	NEXT DUE
Bios Defender Low Flow	510	122903	Annually	8/23/2011
High flow Impactor Pump	10-709	1298-2617	Annually	Out of Service
Mini-Buck Calibrator	M-30	M-5648B	Annually	9/20/2012
Mercury Vapor Analyzer (Jerome)	431-X	1835	Annually	4/21/2011
Mercury Vapor Analyzer (Jerome)	J405-0007	40500498	Annually	10/2012
PhD Ultra Atmosphere Monitor (Combustible Gas Meters)	02-30102N	10406	As Needed	Out of Service
PhD Ultra Atmosphere Monitor (CGM)	02-30102N	10389	As Needed	Out of Service
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
HCHO 7000 Series	7162	811647	Every 2 years	Out of Service
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	6/23/2012
Miran Sapphire (ASHRAE)	205B	205B-79375-398	Annually	8/2/2012
Shorridge 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
UXR Boroscope			No Calibration	No Calibration
VelociCalc Plus	8360	40110	Annually	Out of Service
VelociCalc Plus	8360	603016	Annually	Out of Service
VelociCalc Plus	8384A	57020273	Annually	Out of Service
VelociCalc Plus	9535	0720005	Annually	1/2012
VelociCalc Plus	9545	0807001	Annually	4/13/2012
VelociCalc Plus	9545	0807006	Annually	4/13/2012
FitTester Quantitative Respirator Leak Rate Analyzer	3000	0189	Annually	8/8/2012
MultiRae Personal Multigas Monitor	PGM50-5P	095-512273	Monthly	10/20/2011
MultiRae Personal Multigas Monitor	PGM50-5P	095-518178	Monthly	10/20/2011
MultiRae Personal Multigas Monitor	PGM50-5P	095-518221	Monthly	10/20/2011
MultiRae Personal Multigas Monitor	PGM50-5P	095-518218	Monthly	10/20/2011
MultiRae Personal Multigas Monitor	PGM50-5P	095-518200	Monthly	10/20/2011
Rotameter	MMA-25		Quarterly	Out of Service
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		NLE 080021	Annually	Out of Service
Quest Noise Pro DL Dosimeter		NLE 080022	Annually	Out of Service

**TABLE 8 - Inspection Statistics**

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

TABLE 9 - Respirator Statistics

RESPIRATOR USE	USERS 10/11	USERS 09/10	USERS 08/09	USERS 07/08
PHYSICAL	305	325	481	388
TRAIN	184	349	440	354
FIT TEST	175	199	277	205

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

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

TABLE 10- Hood Certification Statistics

ASHRAE TEST	10/11	09/10	08/09	07/08	06/07	05/06	04/05	03/04	02/03	01/02	00/01
PASS	5	54	6	6	13	6	90	20	65	58	149
RESTRICTED	2	2	0	0	0	7	17	3	17	21	54
FAILED	0	0	1	1	0	0	0	4	16	15	17
N/A	0	9	0	0	0	0	0	0	0	0	1
TOTAL	7	65	7	7	13	13	107	27	98	95	221

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

TABLE 11- Clearance/ Relocation Trends

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

TABLE 12 - DOT/ IATA Shipping Trends

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

TABLE 13 - Security Check Trends

SECURITY CHECK VIOLATIONS	10/11	09/10	08/09	07/08	06/07	05/06
BRB	8	19	7	12	13	18
MED EAST	0	5	1	2	4	2
WOOD	3	9	6	13	7	18
RESEARCH TOWER	3	6	0	4	5	12
HOSPITAL BUILDINGS	0	2	1	0	0	6
WOLSTEIN	10	30	8	5	23	12
MILLIS	0	0	1	0	3	4
AW SMITH/ ROCKEFELLER	0	0	0	1	1	2
KHS	0	0	0	0	0	0
TOTAL	24	71	24	37	56	74

TABLE 14 - Injury Trends

INJURY TYPES	10/11	09/10	08/09	07/08	06/07	05/06
NEEDLESTICK	28	22	18	16	2	23
BLOOD SPLATTER	4	1	2	0	0	1
CHEMICAL SPILL	4	10	10	8	11	10
BURN	11	4	4	0	0	0
CONCUSSION/ CONTUSION	13	4	4	0	0	0
LACERATION	35	30	30	21	16	1
PUNCTURE	0	4	4	2	9	2
STRAIN/ SPRAIN	4	8	8	3	17	2
SLIP/ FALL	35	17	28	24	11	3
OTHER	3	27	23	21	9	12
INHALATION	3	4	4	6	3	0
ANIMAL BITE	14	12	16	3	3	0
TOTAL	154	143	155	104	81	54

DEPARTMENT OF INJURY	10/11	09/10	08/09	07/08	06/07	05/06
DENTAL	28	11	26	21	13	25
NURSING	0	2	1	5	0	0
MEDICINE	34	8	8	28	8	11
CUSTODIAL	11	8	8	17	14	1
ARC	6	5	3	3	3	4
ARTS/SCIENCE	14	12	12	8	3	6
ENGINEERING	8	12	12	4	0	1
PLANT	5	10	10	8	5	0
SECURITY	2	10	6	0	0	0
OTHER	46	65	69	10	35	7
TOTAL	154	143	155	104	81	54

TABLE 15 - Incident Trends

INCIDENTS	10/11	09/10	08/09	07/08	06/07	05/06	04/05
INDOOR AIR QUALITY	9	7	8	6	3	0	2
BIOHAZARD	5	10	0	0	0	0	0
CLOGGED DRAIN	0	1	0	0	0	0	0
EXPLOSION	0	1	0	0	0	0	0
FALL HAZARD	0	1	0	0	0	0	0
FOOD IN LABORATORY	1	2	0	0	0	0	0
ALLERGEN	0	1	0	0	0	0	0
PLUMBING	0	3	0	0	0	0	0
SECURITY BREACH	0	2	0	0	0	0	0
SUSPICIOUS SUBSTANCE	2	3	0	0	0	0	0
UNSAFE CONDITIONS	0	1	0	0	0	0	0
DEAD MOUSE	0	0	0	1	0	0	0
ODOR	69	60	80	96	54	49	107
ASBESTOS	1	2	0	0	0	38	15
MOLD/ FUNGUS	1	9	3	9	3	19	18
WATER SAMPLING	0	0	0	0	0	0	14
NOISE	2	4	0	0	1	2	1
SPILLS	24	25	9	17	14	38	22
FIRE	1	2	1	5	2	3	4
INJURY	1	0	5	1	81	54	10
WASTE DISPOSAL	14	15	12	37	12	7	12
LEAD	0	0	0	0	1	0	2
FORMALDEHYDE	0	0	0	0	0	0	3
GAS	17	22	0	0	19	24	25
OTHER	17	12	22	16	12	13	49
ALARM	14	26	15	11	21	15	0
ANESTHETIC	0	0	14	1	0	0	0
HOOD	3	1	2	3	0	8	0
EXPOSURE	0	0	18	2	2	0	0
FLOOD	5	8	6	5	9	0	0
LEAK	1	0	9	2	4	0	0
MERCURY	2	10	0	11	6	0	0
REPAIR	0	0	0	0	1	0	0
DAMAGED CYLINDER	1	0	0	0	0	0	0
BLOOD IN ELEVATOR	1	0	0	0	0	0	0
INTRUSION ALARM	8	0	0	0	0	0	0
TOTAL	199	230	190	223	245	271	306

INCIDENT/ INQUIRY	10/11	09/10	08/09	07/08	06/ 07	05/ 06	04/ 05	03/ 04	02/ 03	01/ 02	00/ 01	99/ 00
TOTAL	199	230	190	223	245	271	306	297	204	210	152	201

**TABLE 16 - Emergency Response Equipment**

AN ACTION PLAN FOR MAINTAINING PROPER READINESS WAS DEVELOPED USING EQUIPMENT AS FOLLOWS:

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

**SPECIAL EQUIPMENT ON-HAND INCLUDES:**

**Gloves (Boxes)**

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

**Suits (Boxes)**

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

**Foot Protection (Pair)**

Tyvek polycoated booties (8)	Hazmat boots (3)
Tingley ER orange boots (2)	Rainfair ER yellow boots (2)

**Eye Protection (Each)**

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

**Respirator (Each)**

Full face respirator 3000 series (1)	N95 Respirator (80-100)
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TABLE 17 - Construction Projects Inspection for 2010/2011

- Service Building 3<sup>rd</sup> Floor Renovation
- BioEnterprise 3<sup>rd</sup> & 4<sup>th</sup> Floor Renovation
- BioEnterprise Boiler Installation
- BioEnterprise Parking Garage Renovation/Repair
- Triangle Office Complex Environmental Assessment
- Triangle Office Complex Demolition
- Triangle Apartments Huntington Bank Build-out
- Triangle Parking Garage Renovation
- Tomlinson Building Renovation Phase II
- Raymond Roof Project
- Clark Tower Roof Project
- Leutner Cafeteria Renovation Project
- Valley Ridge Farm House #9 Lead Abatement Project – Pruden/McGee
- Valleevue Farm Bond House Lead Paint Assessment – Pruden/McGee
- Adelbert Flood/Mold/Renovation Project – Garden Level
- Adelbert Foundation Water Proofing Project
- Adelbert Quad Step/Rear Access Project
- White Laboratory 601-611 ACM Abatement/Renovation
- White 5<sup>th</sup> Floor ACM Abatement Project – Offices
- White ACM Abatement & Build-out of Suite 522 – Holter Project
- White 4<sup>th</sup> Floor Renovation Project
- Millis Flood/Mold Renovation Laboratory 316/318
- Wind Turbine Project – CWRU Veale Quad
- Veale Gym ACM Abatement
- Veale Gym Floor Replacement Project
- Veale Building – Cardio Room Renovation
- Gund Law School – Water & Mold Abatement in Room 105
- Gund Law School – Water & Mold Abatement in Room 255
- Scholars House – Phi Sigma Rowe Laundry Room Mold Issue
- Triangle Office Complex Environmental Assessment Preparation for Demolition
- AW Smith Roof & Parapit Project
- AW Smith Laboratory Renovation in Rooms 322 & 324
- Thwing GLTB Project
- Cottage Renovation for Bon Appetit
- Triangle Buildings #1 Huntington Bank Relocation/Renovation
- The Temple Project – Marc Rubin, EHS
- CCSB Project – Christie/Daniel Davis
- Solar Panel Project – Adelbert Gym – Matthews Project
- ARC Ceiling Failure in Robbins B12J – Christie Project
- ZBT House Environmental Project & Assessment
- KHS New Laboratory Build-out Basement
- KHS 3<sup>rd</sup> Floor Laboratory Renovation
- White Building 6<sup>th</sup> Floor Renovation & Environmental Assessment – Holter
- White Building 5<sup>th</sup> Floor Renovation & Environmental Assessment – Holter
- Millis Flood Cleanup Project of Room 211, 1<sup>st</sup> & 2<sup>nd</sup> Floors
- AW Smith Lead Abatement Assessment for Window Replacement – Bondra Project
- Med East/Robbins 2<sup>nd</sup> Floor Renovation – Davis
- Quad Chilled Water Line Replacement Quad Area – Arlia/MCCO
- Tomlinson Cafeteria – Lead Abatement Assessment in Storage Rooms – Vic Orbin
- Waste Building – Dark Laboratory Project Rooms 503, 505, 507, & 523 – Holter Project
- Kelvin Smith Library Coffee Shop Project – Nick Christie Project Manager
- Wood Building 4<sup>th</sup> Floor East Mechanical Room ACM Abatement – Arlia Project
- Millis Chilled Water Project – Basement Mechanical Room – Arlia Project
- Crawford Basement – Chilled Water Project & ACM Abatement in Mechanical Room – Arlia Project
- Cutter Dorm Floor Tile Abatement – Jereb Project
- Pathology Project ACM Abatement & Construction in Plastic Surgery Suites – Christie Project
- North Residential Village House #6 Floor Sprinkler Flood/Cleanup

TABLE 18 - DISPOSAL SITE WASTE DISTRIBUTION

WASTE TYPE	MILLIS G35	ART STUDIO	DOA 990	CASC	WOLSTEIN	FARM
CONTAINERS, <1 GAL (#)	2084	0	2511	188	614	0
CONTAINERS, UNKNOWN (#)	102	0	17	0	11	0
CONTAINERS (DIRECT INCINERATION) (#)	198	0	55	0	28	0
CYLINDERS (#)	22	0	3	6	0	0
DRUM, EMPTY (55 GAL)	0	0	1	1	0	0
DRUM, EMBALMING FLUID (55 GAL)	0	0	3	0	0	0
DRUM, OIL (55 GAL)	0	0	0	2	0	0
DRUM, FORMALIN (55 GAL)	0	0	15	0	0	0
DRUM, PHOTO WASTE (55 GAL)	0	2	6	0	0	0
DRUM, METHANOL/ TISSUE (55 GAL)	0	0	28	0	0	0
DRUM, ANTIFREEZE (55 GAL)	0	0	0	1	0	0
DRUM, LEAD PAINT/DEBRIS (55 GAL)	0	0	0	0	0	4
DRUM, WASTEWATER WITH LIQUID (55 GAL)	0	0	0	0	0	1
DRUM, NON-HAZARDOUS LIQUID (55 GAL)	0	0	0	1	0	0
DRUM, NON-HAZARDOUS SOLID (55 GAL)	0	0	0	2	0	0
PAIS (5 GAL)	0	0	10	0	0	0
PAIS (2-5 GAL)	173	0	58	30	6	0
VIALS (#)	54	0	422	0	6	0
VIALS (UNKNOWN) (#)	3	0	0	0	0	0
VIAL (DIRECT INCINERATE) (#)	0	0	2	0	0	0

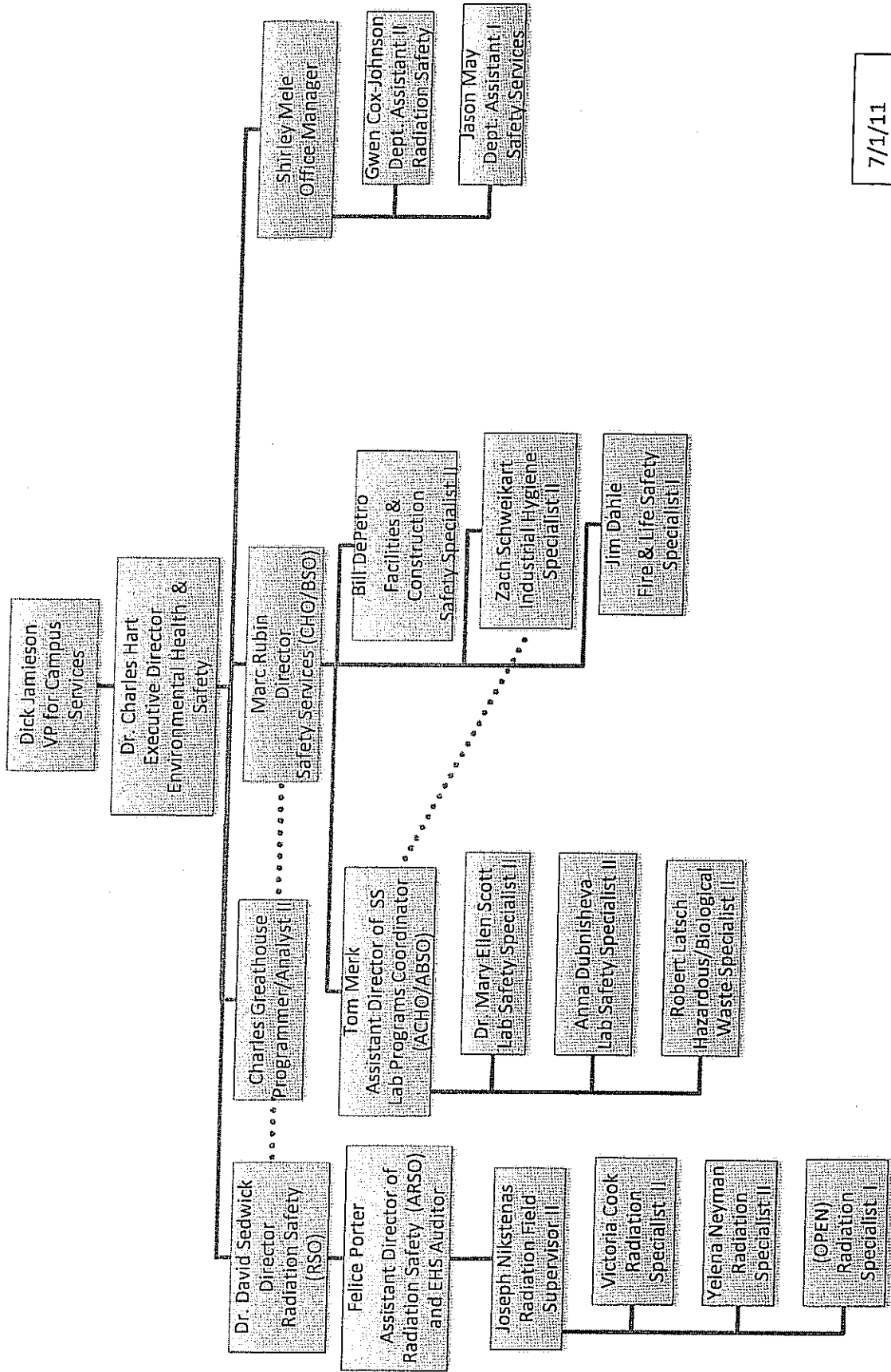
TABLE 19- RECYCLING

WASTE TYPE	CASC (# of units)	DOA (# of units)	WOLSTEIN (# of units)
BALLASTS (PCB)	2517	401	0
BALLASTS (NON-PCB) (#)	2574	0	0
BATTERIES, ACID/LEAD (#)	15	130	25
BATTERIES, NON-SPILLABLE (#)	49	0	0
BATTERIES, ALKALINE (#)	178	43	0
BATTERIES, NI-CD (#)	65	0	0
BATTERIES, LITHIUM (#)	22	0	0
ELECTRONICS	6	0	0
BULBS, FLOURESCENT (#)	0	142	0





# Environmental Health & Safety Organizational Chart



7/1/11