

OFFICE OF THE VICE PRESIDENT FOR RESEARCH
ENVIRONMENTAL HEALTH AND SAFETY

PROGRAMS & SERVICES REPORT

A YEAR IN REVIEW



DEAR COLLEAGUES:

Environmental Health and Safety (EHS) supports the University’s mission of research, education, patient care and service through the promotion of safety, regulatory compliance and environmental stewardship. So what exactly does this mean, and what exactly does EHS do?

Depending upon your perspective, you might think of EHS as the folks who periodically visit your research laboratory to remove regulated wastes; or as those who advise regarding the safe, compliant conduct of experiments involving hazardous materials, procedures involving hazardous equipment, or work being performed in hazardous and regulated environments. Or, you may think of EHS as the group that conducts state-mandated fire drills in your residence hall, or performs air quality testing and ergonomic assessments in your office. If you work in the medical setting, you may think of EHS as the folks who manage the dosimetry badges that track your exposure to radiation. In reality, EHS provides all these services, and much more.

The purpose of this report is to help the University community better understand the broad and complex role of EHS, our major program areas and services, the scale in which we operate, and the diverse range of resources we offer in support of the University’s mission.

The programs and achievements you will read about in this report result from the combination of a highly talented and dedicated EHS staff, partnerships that have been fostered among faculty, staff, and students across grounds; and the strong, committed support of senior University leadership. On behalf of the entire EHS team, we hope you find this report informative and insightful, and we encourage you to reach out to us with any feedback, ideas or suggestions.



Tom Leonard
Director, Environmental Health & Safety
Office of the Vice President for Research

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EHS BY THE NUMBERS

A few examples of our service metrics from the 2017 calendar year.



SAFETY AND COMPLIANCE THROUGH PARTNERSHIP

Partnering with EHS Biosafety, the Institutional Biosafety Committee reviewed and approved over **411** research protocols, including **27** new investigators.

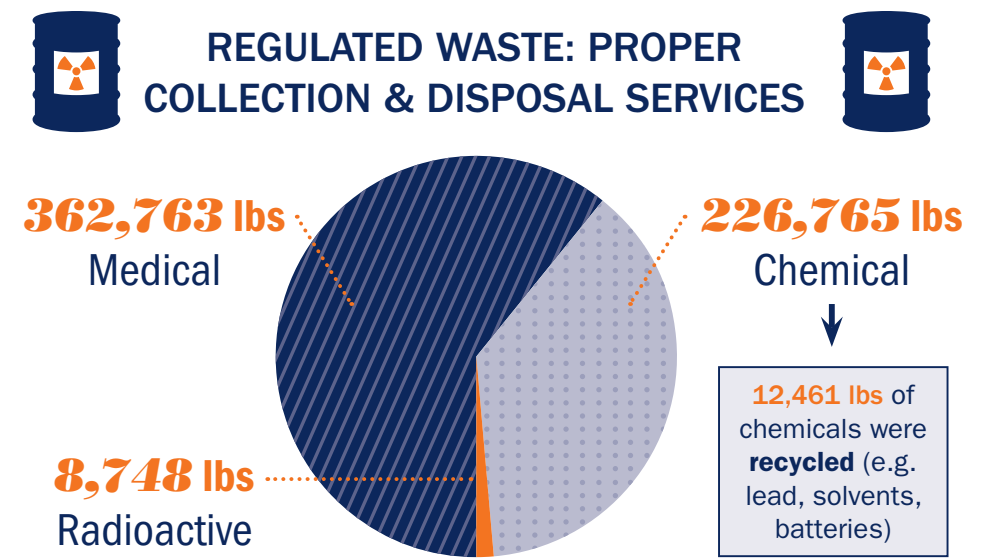
106 YEARS

Combined experience of our Radiation Safety Team



157 YEARS

Combined Fire Services experience of our Fire Safety Team

IN 2017:

- 53** user applications,
- 85** new dosimeter applications
- 30** pregnancy declaration forms were reviewed and processed.

Laser Safety in Research Labs

- 96** Laser registrations
- 98** Researchers trained
- 28** Consultations with PIs of new and existing Laser Labs

ENVIRONMENTAL HEALTH AND SAFETY

PROGRAM AREAS

- **BIOSAFETY**
- **RADIATION SAFETY**
- **HAZARDOUS MATERIALS**
- **CHEMICAL & LABORATORY SAFETY**
- **OCCUPATIONAL HEALTH**
- **FIRE SAFETY & PREVENTION**
- **ASBESTOS & LEAD SAFETY**
- **INFORMATION TECHNOLOGY**
- **ADMINISTRATIVE & OPERATIONAL SUPPORT**

BIOSAFETY

The primary mission of the EHS Biosafety Program is to provide assistance to the University community in assuring that research involving biological agents is conducted in a safe and responsible manner, and that these activities are in compliance with external regulations and applicable University policies. Work with microorganisms including Select Agents, Recombinant or Synthetic Nucleic Acid Molecules as defined by NIH Guidelines, materials derived from human and non-human primates, and biological toxins all fall under the purview of Biosafety.

FEDERAL AND STATE AGENCIES WITH BIOSAFETY OVERSIGHT

- Centers for Disease Control and Prevention/CDC
- Animal Plant Health Inspection Service/APHIS
- International Air Transport Association/IATA
- Department of Transportation/DOT
- Federal Aviation Administration/FAA
- Virginia Department of Health/VDH
- Virginia Department of Environmental Quality/VDEQ

Three biosafety program team members manage and implement the various program areas. Additionally, two EHS staff members from other program areas serve as biosafety cabinet certifiers to help support the in-house biosafety cabinet certification program. The Institutional Biosafety Committee (IBC) Coordinator reports to the Director of EHS and is essential to coordination between the committee and the biosafety team. The Director of EHS serves as the UVA Responsible Official for Select Agents and is a member of the Institutional Biosafety Committee.

- **Erica Pearce** – Biosafety Officer, MS, CBSP and Alternate Responsible Official for Select Agents. Class I/II Waste Management Facility Operator with the Virginia Department of Occupation and Regulation.
- **Jennifer Branum** – Senior Associate Biosafety Officer, CBSP RBP, [SM]NRM, MT and Alternate Responsible Official for Select Agents
- **Vernell Hensley** – Biosafety Specialist
- **Paul Skoglund** – PhD, IBC Coordinator
- **Dwight Smith** – Hazardous Materials Technician and Biosafety Cabinet Certifier (NSF49 Certified)
- **Jennifer Cottingham** – Senior Industrial Hygiene Technician and Biosafety Cabinet Certifier
- **Tom Leonard** – Director of EHS, PhD, CBSP, CSP, Responsible Official for Select Agents

PROFESSIONAL SAFETY ASSOCIATION MEMBERSHIPS AND UNIVERSITY COMMITTEES

- American Biological Safety Association (ABSA International)
- Chesapeake Bay Chapter of ABSA
- Institutional Biosafety Committee
- Institutional Animal Care and Use Committee
- AAALAC Occupational Health Subcommittee



UVA Medical Center

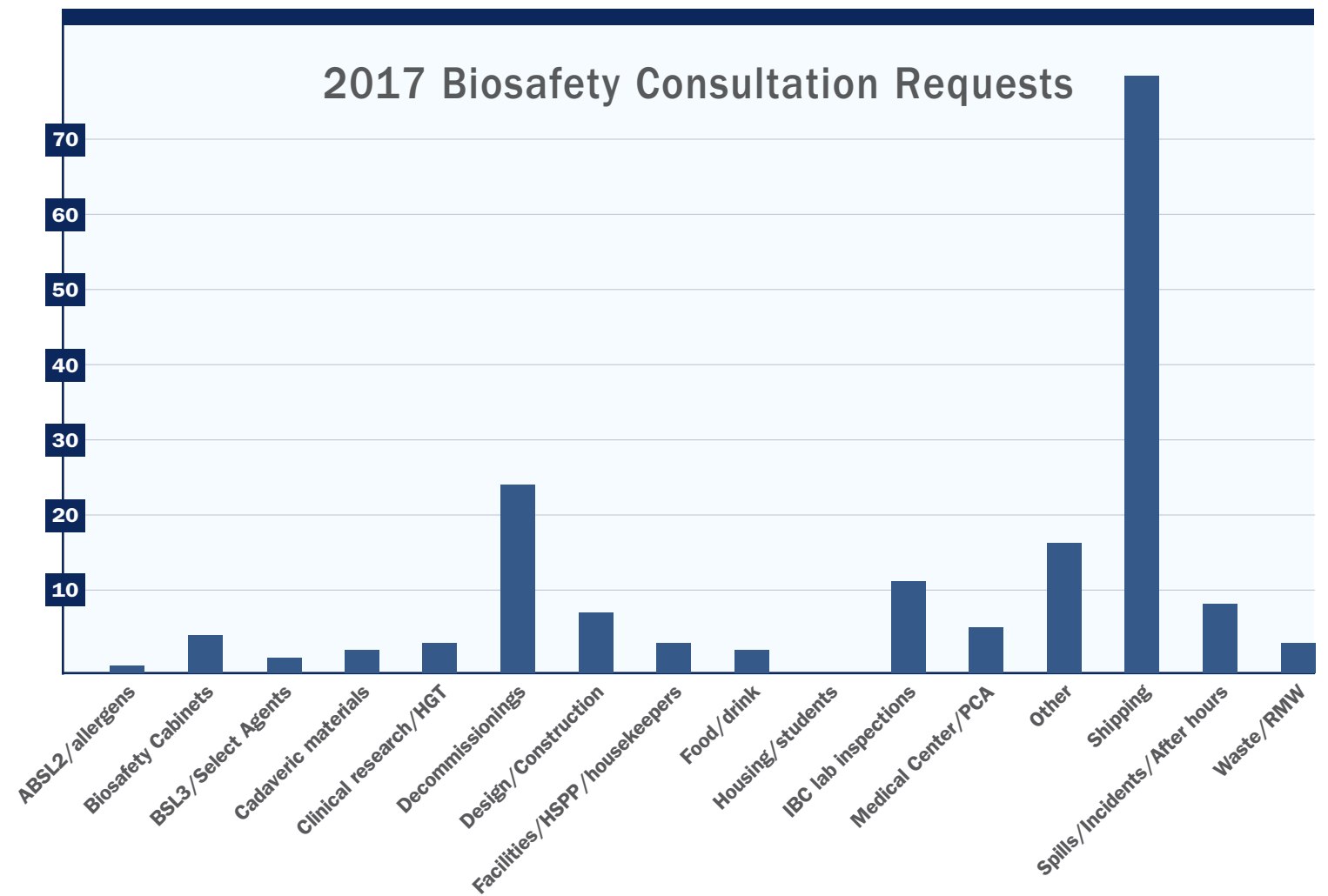
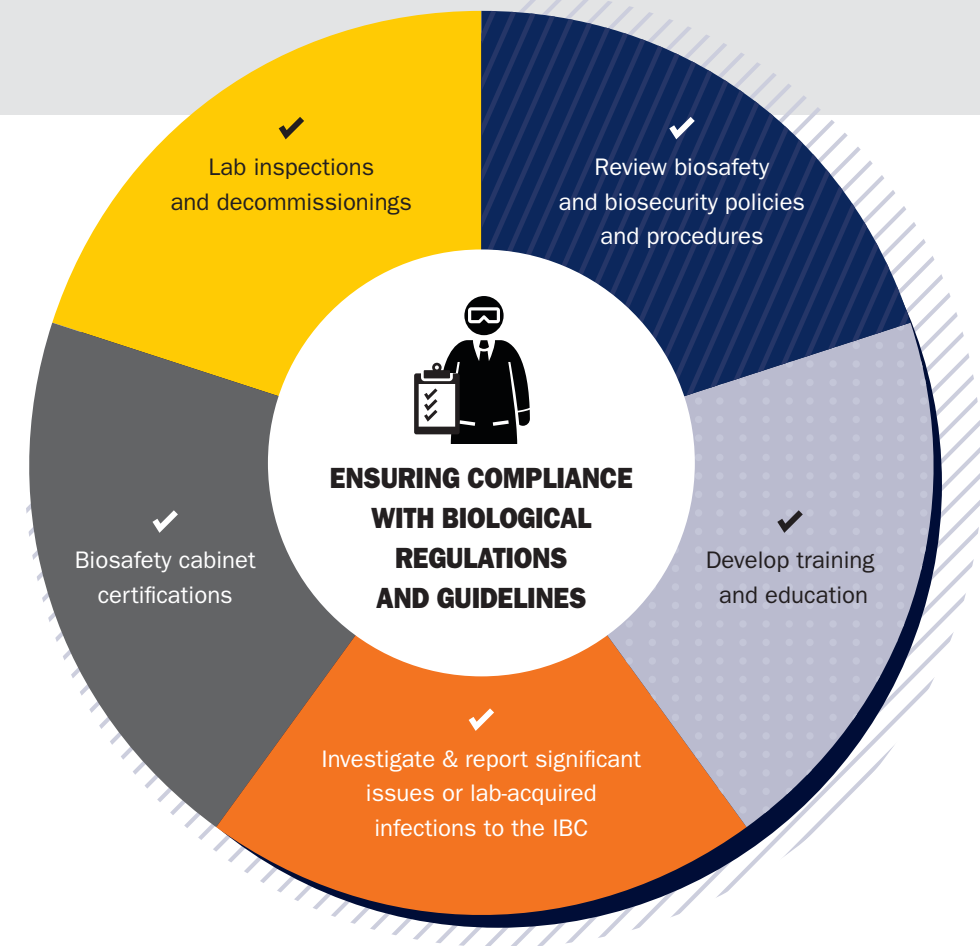
Select University & Community Partnerships

INTERNAL

- Facilities, Police & Emergency Preparedness
- Medical Center
- WorkMed & Student Health
- Export Controls

EXTERNAL

- CDC Division of Select Agents and Toxins
- FBI Weapons of Mass Destruction
- Jefferson District - VDH
- Charlottesville Fire Dept.





Biosafety staff provide training on the proper use of personal protective equipment.

SUPPORT FOR ANIMAL CARE AND USE PROGRAMS



• Biosafety provides support to the Institutional Animal Care and Use Committee (ACUC) through consultations, training, inspections and accident investigations. The Biosafety Officer also serves as a voting member of the ACUC, providing biosafety and other EHS-related subject matter expertise.

SUPPORTING THE MEDICAL CENTER, CLINICAL AND TRANSLATIONAL RESEARCH

- The UVA Hospital relies on EHS for support in many areas like biosafety cabinet certification services and regulated medical waste management. The biosafety team collaborates with the Medical Center Safety Manager on a variety of biosafety-related topics throughout the year.
- 2017 saw tremendous growth in Human Gene Transfer (HGT) clinical trials, which involves transferring genetic material into a consenting subject. HGT holds promise in the treatment of certain health conditions by compensating for defective genes, producing a potentially novel therapeutic substance, or triggering the immune system to fight disease.
- Biosafety personnel partnered with the IBC and the Institutional Review Board to update the School of Medicine’s

Human Gene Transfer policy, to better aligning with recent changes in federal guidelines.

- Biosafety staff provided technical guidance to the Emily Couric Center Pharmacy, Department of Radiology and Medical Imaging, and other medical center divisions. A major focus of this training was to promote “best practices” for disinfectant use in new studies involving clinical research subjects.
- In 2017, the biosafety group provided technical guidance to the autopsy team regarding safe work practices and equipment for handling tissues potentially infected with agents which cause prion diseases such as Creutzfeldt-Jakob or CJD.
- Provided consultation to various phlebotomy locations within the Medical Center to revisit proper sharps disposal.
- Participated in facility design review for the MR6 biorepository facility, the Pinn Hall cGMP facility, the proposed INOVA ICPH facility, and other planned renovations.
- Helped advise on the new MR6 Biorepository facility.

BIOSAFETY LEVEL 3 CONTAINMENT AND SELECT AGENTS

- UVA’s School of Medicine provides a biosafety level 3 containment facility for the research community, and EHS supports the facility in collaboration with the Center for Comparative Medicine, Facilities Management, UPD, UVA WorkMed and other organizational units. Maintaining a biocontainment facility that operates safely and in

compliance with rigorous federal regulations is among the biosafety program’s highest priorities and challenges. 2017 marked another successful year in maintaining approval from the Centers for Disease Control and Prevention, Federal Select Agent Program to conduct research with Tier 1 Select Agents.

SPECIAL PROJECTS & COLLABORATIONS

- 181 Hepatitis B vaccination declination forms were collected from research laboratories and transferred to UVA WorkMed, the University’s primary occupational health provider. This 2017 project was initiated by EHS biosafety and executed to ensure proper occupational health recordkeeping.
- The biosafety team continues to work closely with members of the UVA Export Control group, providing consultation on a range of issues. In 2017, the biosafety group provided educational tours of a University Biosafety Level 3 Containment Facility to promote awareness and understanding of high containment regulatory requirements and practices.
- The UVA Biosafety team manages an in-house biological safety cabinet (BSC) certification program to provide convenient, rapid and cost effective services to the UVA community. Most institutions rely exclusively on contractors for this service. In 2017, nearly 50% of UVA BSCs were certified by EHS technicians. Dwight Smith, UVAs lead BSC technician maintains certification by the National Safety Foundation – one of only a handful in Virginia.



- Laboratory tissue culture contamination issues are often brought to the attention of biosafety staff to provide technical support and troubleshooting. In 2017, laboratories in Cobb Hall, Pinn Hall, and the Physical Life Science Building requested assistance from EHS. While these events do not typically provide a risk to human health, EHS biosafety provides a review of procedures since contamination has an adverse impact on experiments and research.



NATIONAL BIOSAFETY MONTH

The National Institutes of Health, Office of Science promotes National Biosafety Stewardship Month every October to encourage institutions to promote a better workplace culture in biosafety. In 2017, the biosafety program partnered with CavMan to promote biosafety awareness in several research buildings. The afternoon was a great success and Principal Investigators, students and staff were eager to capture a photo with CavMan and learn about the biosafety month promotional message.



RADIATION SAFETY



The EHS Radiation Safety Group (RSG) supports the education and research mission of the University by assisting researchers, teaching laboratories and support facilities with compliance issues related to the safe receipt, storage and use of radioactive materials and radiation-emitting devices. RSG's primary objectives are to protect personnel and the general public from unwarranted radiation exposure, protect the environment by minimizing release of radioactive material in effluents, ensure compliance with all applicable State and Federal regulations and to monitor and advise in the safe use of radioactive materials and analytical radiation producing equipment at the University of Virginia.

MAJOR PROGRAM RESPONSIBILITIES

- authorization of individuals to work under the University's broad scope radioactive materials license
- training of personnel in the safe use of radioactive material
- administering the personnel and environmental dosimetry program
- procurement of all radioactive material
- shipment and receipt of all radioactive material for the University
- collection, packaging, and disposal of all radioactive waste
- performance of routine laboratory inspections
- commissioning and decommissioning of all radioactive material use areas
- emergency response

RSG is managed by the Radiation Safety Officer (RSO). The RSO is a member of the Radiation Safety Committee (RSC) which reports through the Vice President of Research to the President. RSC advises senior management on issues related to regulations that dictate the use and disposal of radioactive materials.

RSG is responsible for maintaining the radioactive materials license issued by the Virginia Department of Health's, Office of Radiological Health (VDH). This license permits the possession and use of radioactive material in research and Medical Center clinical activities. Additionally, RSG registers all analytical machines that produce x-rays, e.g., X-ray diffraction equipment.

RSG is responsible for management of issues and resources related to regulatory controls of radiation and coordinates compliance inspection activities when agencies conduct inspections.

THE FOLLOWING AGENCIES REGULATE AND GUIDE OUR ACTIVITIES

- Virginia Department of Health/Radioactive Materials Program (VDH-RMP)
- Nuclear Regulatory Commission (NRC)/National Source Tracking System (NSTS)
- International Commission on Radiological Protection (ICRP)
- National Council on Radiation Protection and Measurements (NCRP)
- Environmental Protection Agency (EPA)
- Department of Transportation (DOT)
- Federal Aviation Association (FAA)
- Joint Commission on Accreditation of Healthcare Organizations (JCAHO)
- Occupational Safety and Health Administration (OSHA)

The Radiation Safety Program is staffed with seven health physicists who manage and implement the various program areas.

- **Mike Welling** – Radiation Safety Officer
- **Debby Steva** – Radiation Safety Officer (retired October 2018)
- **Mike Cohen** – Associate Radiation Safety Officer
- **Trevor Thomas** – Radiation Safety Technician Supervisor
- **Greg Payne** – Senior Radiation Safety Technician
- **Tim Quesenberry** – Senior Radiation Safety Technician
- **Mike Myrsten** – Senior Radiation Safety Technician
- **Shane Crider** – Radiation Safety Technician



PROFESSIONAL SAFETY ASSOCIATIONS & UNIVERSITY COMMITTEES

- Radiation Safety Committee (RSC)
- Clinical Radiation Safety Committee (CRSC)
- Radioactive Drug Research Committee (RDRC)
- Human Investigations Involving Radiation Exposure (HIRE)
- Radiation Injury Treatment Network (RITN)
- Hazardous Waste Work Group
- Security Work Group
- Staff Senate
- Commissioning/Decommissioning Committee
- Health Physics Society
- Virginia Chapter of the Health Physics Society
- Academic and Medical Radiation Safety Officers Group (AMRSO)
- InfraGard National Infrastructure Protection

SELECT UNIVERSITY & COMMUNITY PARTNERSHIPS

- UVA Police
- Medical Center Nuclear Medicine, Nuclear Cardiology, Radiation Oncology, Medical Physics, Gamma Knife
- Breast Care Center, Epilepsy, Bloodbank
- Surgical Pathology
- Office of Safety and Emergency Preparedness
- UVA ID Services
- Facilities Management
- Environmental Services
- Export Control Office
- Records Management
- Comparative Medicine (Vivarium)
- Public - Requests to survey items for radioactivity
- Sandia National Labs/Radiological Security Programs
- Charlottesville/Albemarle Fire Departments
- PVCC Radiography Program
- FBI
- Rivanna Water & Sewer Authority



More than 60 principal investigators are approved to conduct research with Radioactive Materials at UVA.

RADIATION DOSE MONITORING

RSG coordinates acquisition and assignment of whole body and extremity dosimeters for individuals in the research community as well as the medical center. In 2017, 370 dosimeter applications were received and processed. A total of 1756 individuals were issued dosimeters requiring an exchange of 14,352 dosimeters over the course of the year. 13 pregnant worker declaration forms were processed and the pregnant workers were issued additional dosimeters, counseling and protection information. The RSO reviews all monitoring reports and investigates doses over 10% of the regulatory limits as established in the ALARA program.

In addition to personnel monitoring, 71 environmental or area dosimeters are deployed and managed to ensure that doses to members of the public in unrestricted areas do not exceed the regulatory dose limits. The office also operates and responds to alarms from 3 radiation “portal monitors” to ensure that radioactive material does not inadvertently leave the university in medical center waste.

BIOASSAY PROGRAM

Radiation worker dose can result from internal exposures as well as external exposures. Personnel who perform work with radioiodine or whose use of other radioactive material exceeds a certain trigger level, must have a bioassay performed to evaluate the

potential intake and uptake of radioactive material in their bodies. The bioassay program provides a mechanism to evaluate the adequacy of protective measures being utilized.

In 2017, 82 bioassay measurements were performed on individuals primarily working with radioiodine. No significant uptakes were detected.

MEDICAL CENTER HEALTH PHYSICS SUPPORT

The University operates a large teaching hospital/medical center. Nuclear Medicine, Nuclear Cardiology and Radiation Oncology departments rely on RSG for many health physics support services.

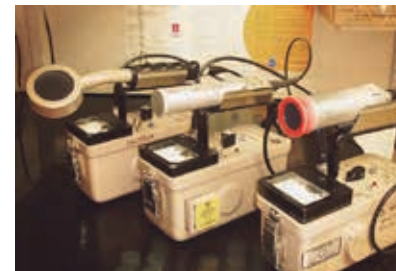
These services include providing consultation and patient release instructions to patients receiving therapeutic amounts of radioiodine, providing radiation safety guidance and monitoring during medical procedures utilizing radioactive material.



Occasionally an iodine therapy patient may not be released following therapy due to potential radiation exposure to family members. The patient must be treated as an inpatient and remain in the hospital for 2-3 days. RSG must prepare the hospital room by covering all surfaces and decontaminating the room following patient release. There were 4 such inpatients in 2017. The University's Breast Care Center uses radioactive “seeds” for breast lesion localization prior to biopsy. RSG provided 138 seed transports from the OR to Surgical Pathology and then to EHS for disposal.

RADIATION SURVEY INSTRUMENT CALIBRATION

All survey instruments used to measure radiation exposure levels or contamination must be calibrated at least annually. 221 instruments were calibrated in 2017.



RADIOACTIVE SOURCE MANAGEMENT

Regulations require a semi-annual leak test (or inventory if not in use) of all radioactive sources above a certain activity. Presently there are approximately 49 sources that require testing. In 2017, 98 leak tests were conducted and no leaking sources were identified.

Some radioactive sources require enhanced security in the form of additional monitoring, inspection and alarms. RSG must perform routine inspections, alarm response and security program reviews for these sources. Individuals who need to use these sources must be escorted. RSG staff provided 212 escorts in 2017.

RADIOACTIVE MATERIAL ORDER, RECEIPT AND SHIPMENT

The acquisition of radioactive material is highly regulated. All radioactive material orders must be approved by RSG. The complexity of transport regulations (involving several agencies) and our license conditions require RSG staff to perform most radioactive material receipt and shipment.

In 2017, 421 radioactive material orders were processed, received, and then delivered to the end user. In addition, there were 18 shipments (not including waste) of radioactive material to other licensees. RSG staff must undergo appropriate training in Department of Transportation (DOT) regulations and International Air Transport Association (IATA) guidelines to be able to prepare and certify the shipments.



RADIOACTIVE MATERIALS & WASTE HANDLING

RSG collects, processes and disposes of radioactive waste in a number of different forms. Types of waste include radioactive solid, liquid, liquid scintillation counting fluid in vials, animal, mixed waste and H-3 exit signs.

Staff performed 156 waste “pick-ups” consisting of 1500 individual containers. Short half-life radioactive material may be stored until it decays to background levels. It is then surveyed and prepared for shipment and disposal as non-radioactive laboratory waste. The decay-in-storage program saves the University from significant costs associated with radioactive material disposal offsite. The amount of radioactive waste requiring shipment for disposal as radioactive waste was limited to 16 drums in 2017.

Approximately 250 gallons of liquid waste was absorbed and processed for future shipment as radioactive waste. Five 55 gallon drums of “mixed” waste (both radioactive and hazardous chemical) were processed and prepared for disposal. In addition, 14 illuminated Exit signs containing the radioactive element “tritium” were disposed of in 2017.

CONTAMINATION SURVEYS AND INCIDENT INVESTIGATIONS/RESPONSE

Regulations and the license require that RSG staff perform periodic radiation surveys and inspections of areas where radioactive materials are used. These surveys include measurements of radiation and contamination levels in the labs, proper posting and labeling, proper handling practices and inspection of the laboratory's inventory and survey records. Potentially hazardous conditions and compliance issues are discussed with lab occupants and noted in the inspection report. Examples of possible action items include:

contamination exceeding limits; food or drink in radioactive work areas; lack of proper security of radioactive materials and past due refresher training. Additional surveys are conducted on equipment, research animal housing and spill areas where the potential for contamination exists.

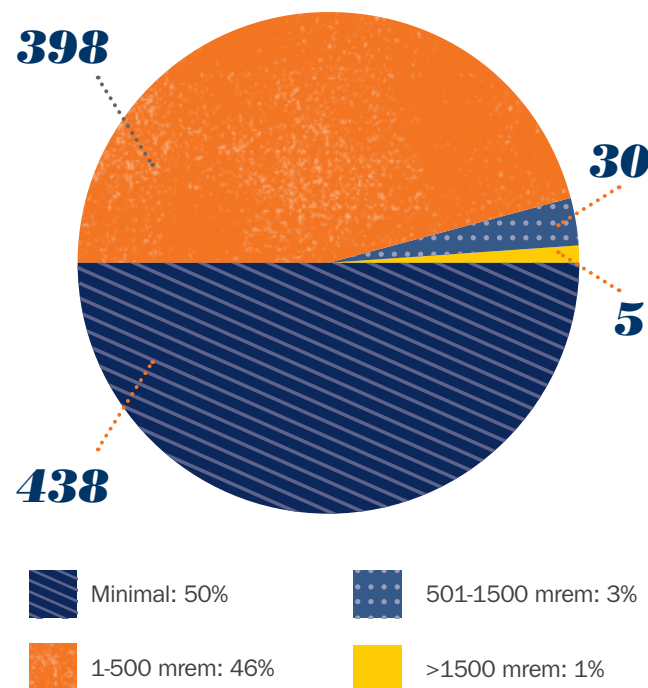
RSG maintains a twenty-four hour emergency response capability for spills and incidents involving radioactivity and radiation exposure. The RSO must report certain types of incidents to our State Regulatory Agency, VDH. There were 11 incidents in 2017 requiring response but none were reportable to the State.

Events resulting in unplanned patient dose or other reportable discrepancy in administration of radiation dose are called Medical Events and must be reported to the State regulatory agency. There was one medical event reported to VDH in 2017.

2017 SERVICE & ACHIEVEMENT HIGHLIGHTS

- Radon measurements in Alderman Library and Thornton
- Installation of additional portal radiation monitors in the Medical Center Battle Building
- Assist with move of Nuclear Cardiology department to Fontaine
- Assisted High Energy Physics Lab with set up of radiation source to test detectors as part of the NOvA project
- Installation of Research Positron Emission Tomography (PET) Imaging laboratory in Snyder Research Facility
- Reconstitution of the Radioactive Drug Research Committee in accordance with FDA regulations, and review/approval of first study involving diabetes research

2017: DOSE SUMMARY (WHOLE BODY DOSIMETER)



HAZARDOUS MATERIALS

The Hazardous Materials Management Program works to assure the safe collection, storage and disposal of hazardous and regulated medical waste generated by UVA, in a manner compliant with numerous local, state and federal regulations.

SERVICES PROVIDED BY THE HAZARDOUS MATERIALS TEAM

- Assistance with laboratory moves and hazardous materials cleanout
- Shipping of hazardous materials
- Pickup, transport and packaging of waste
- Hazardous materials handling
- Solvent recycling
- Guidance on safe management of chemicals
- Emergency spill response – during and after work hours
- Agencies and regulations which govern our work:
 - US Environmental Protection Agency (40 CFR)
 - US Department of Transportation (49 CFR)
 - Virginia Hazardous Waste Management Regulations
 - Virginia Regulated Medical Waste Management Regulations
 - International Air Transport Association Dangerous Goods Regulations
 - Federal Aviation Administration (49 CFR)
 - Occupational Safety & Health Administration (OSHA)

OUR TEAM

- **Adam Peters** – Hazardous Materials Program Manager, B.S., CHMM
- **Derek Snapp** – Hazardous Materials Supervisor
- **Ian Grimm** – Senior Hazardous Materials Technician
- **Dwight Smith** – Hazardous Materials Technician, B.S. NSF BCSC
- **Hunter Yancey** – Hazardous Materials Technician
- **Jeff Neely** – Hazardous Materials Technician

We participate in the UVA Hospital Hazardous Materials Work Group, the Charlottesville/Albemarle Local Emergency planning Committee, and sit on the board of the College and University Hazardous Materials Management Conference.



Derek Snapp leads a laboratory waste clean out.



The Hazardous Material team consolidates over 8,000 liquid waste containers per year.

DID YOU REALIZE, IN 2017 THE HAZARDOUS MATERIALS GROUP PROVIDED:

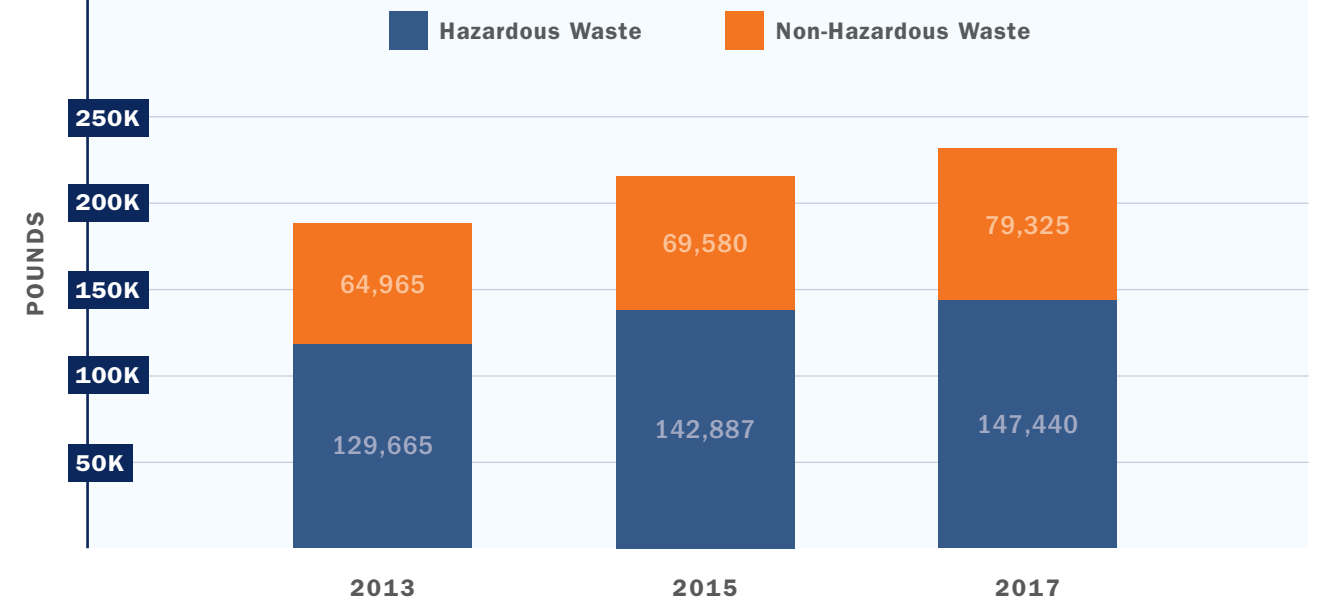
4,201

CLEAN CONTAINERS FOR HAZARDOUS AND NON-HAZARDOUS WASTE

6,000+

CLEAN CONTAINERS FOR REGULATED MEDICAL WASTE

Waste Picked up, Processed, and Shipped



CHEMICAL & LABORATORY SAFETY

W

hile centered around chemical safety and physical hazards encountered in the laboratory environment, the chemical and laboratory safety program provides a spectrum of safety and compliance actions in support of scholarly activities performed in laboratories, shops, studios, and makerspaces. This group also supports hazardous materials management in the medical center and auxiliary services outside of Facilities Management.

Our group's activities are primarily guided and regulated by Occupational Safety and Health Administration (OSHA), Environmental Protection Agency (EPA), Department of Transportation (DOT), and Virginia Fire Code, as well as best practices defined by the National Research Council and consensus standards.

The Chemical and Laboratory Safety Program currently has a staff of four Chemical, Laboratory and Occupational Safety Specialists, who manage and implement the various program areas to provide assurance of a safe and healthy learning and working environment, while maintaining institutional regulatory compliance. Staff participate in professional safety organizations such as the Campus Safety Health and Environmental Management Association (CSHEMA).

Clarissa Lynch – Chemical Safety Officer

Jim Reese – Chemical Safety Specialist; Certified Nutrient Management Planner for the University. Member of the Virginia Turfgrass Council.

Beth Potts – Chemical Safety Specialist

Michelle Whitlock – Occupational Safety Specialist; Competent Person – Forklift Train-the-Trainer, Fall Protection

PARTNERSHIPS AND COMMITTEE SUPPORT

Our group partners closely with research teams across the University: the UVA medical center, athletics department, auxiliary services, facilities management and Charlottesville Fire Department. We provide support and membership for a number of University committees and working groups, including: Medical Center Emergency Management Working Group, Medical Center Safety and Security Subcommittee, Medical Center Hazardous Waste and Materials Work Group, Institutional Animal Care and Use Committee, AAALAC Occupational Health Subcommittee, Makergrounds Safety Committee, Green Labs Work Group, Facilities Management's Crane and Rigging Focus Team.

EXAMPLES OF OUR PROGRAM ACTIVITIES

- Performing routine laboratory and work area inspections, both on grounds and at satellite research facilities (Blandy



Farm, Mountain Lake Biological Station, Anheuser-Busch Coastal Research Center), and The College at Wise

- Providing training for faculty, staff and students on chemical safety and hazardous waste, including in-person safety seminars.
- Maintaining EHS' Hazard Communication Sign database
- Consulting on laboratory moves (on-grounds relocation and institutional transfer) or closures
- Ensuring vacated laboratory spaces are properly decommissioned
- Coordination of large chemical clean-outs of laboratory spaces.
- Providing safety consultation and hazard assessments for research projects and experiments.
- New Faculty Onboarding: Meeting with new research faculty to acquaint them with UVA safety programs, EHS services and resources, and associated research compliance programs as they start up their laboratory.
- Reviewing IACUC protocols involving hazardous chemicals
- Developing training and educational tools for emergent and relevant topics
- Review and maintenance of written plans, policies and procedures
- Performing incident/accident investigations
- Certification and recertification for laboratory personnel who use respirators or operate forklifts
- Laboratory design and construction document review
- Coordination with Charlottesville Fire Department in review of laboratory hazards and operations.

2017: SPECIAL PROJECTS & STORIES OF INTEREST



Makergrounds Safety Committee: This EHS-initiated group celebrated its first full year of activity in 2017. The group facilitates monthly meetings with stakeholders which include faculty and manager representation from the School of Medicine, School of Applied Science and Engineering, Architecture School, and Library. The committee successfully developed and published a hazard classification table; a matrix of the general types of equipment and tools located in University maker spaces, and the corresponding risk of injury that may occur while operating the equipment. The group also created a Makerspace User Agreement, an electronic tool used to inform and document key safety considerations for students who intend to engage in Makerspace activities.



MSDSOnline: EHS and the Medical Center's Environment of Care Division partnered to provide the entire UVA community with access to an industry-leading library of Safety Data Sheets. The process involved several months of evaluating SDS providers, benchmarking with other institutions, choosing the final product, and marketing the tool.



Green Labs Fair: UVA's Office for Sustainability invited EHS to participate in the first Green Labs Fair in the Fall of 2017. EHS assembled and staffed a table to highlight EHS services and efforts related to practices which are both safe and sustainable.



Biorepository Facility Safety Review: The EHS Chemical Safety team partnered with the School of Medicine, Office of Safety & Emergency Preparedness, and Charlottesville Fire Department to conduct a safety review of the recently instituted biorepository facility located in the Carter-Harrison Building (MR6). The facility was redesigned and constructed in 2017 to enhance and expand biological specimen storage capacity. The facility utilizes a bulk storage liquid nitrogen tank, piping the liquid nitrogen from outside the building into specimen freezers. Several safety features were incorporated into the design, including an atmospheric oxygen monitoring system. Members of the Charlottesville Fire Department toured the biorepository facility layout and reviewed specifics of the low oxygen alarm system.



OCCUPATIONAL HEALTH

The occupational health (OH) team provides a wide range of expertise including workplace hazard exposure assessments and exposure monitoring, e.g. air sampling, surface contaminant testing, noise and non-ionizing radiation testing, indoor air quality testing and laboratory building ventilation design reviews. Programs coordinated by this team include the Laboratory Chemical Fume Hood Inspection Program, the Laser Safety Program, the Hearing Conservation Program and the Ergonomics Program. These programs and services contribute to healthy and safe work environments for faculty, students and all UVA supporting staff. Additionally, these programs help the University achieve compliance with OSHA regulations and serve to advance best practices as advised by various professional occupational health and safety organizations. Our work is exciting as it allows us to provide service to UVA principal investigators and their research staff across all the schools within UVA.

TEAM MEMBERS

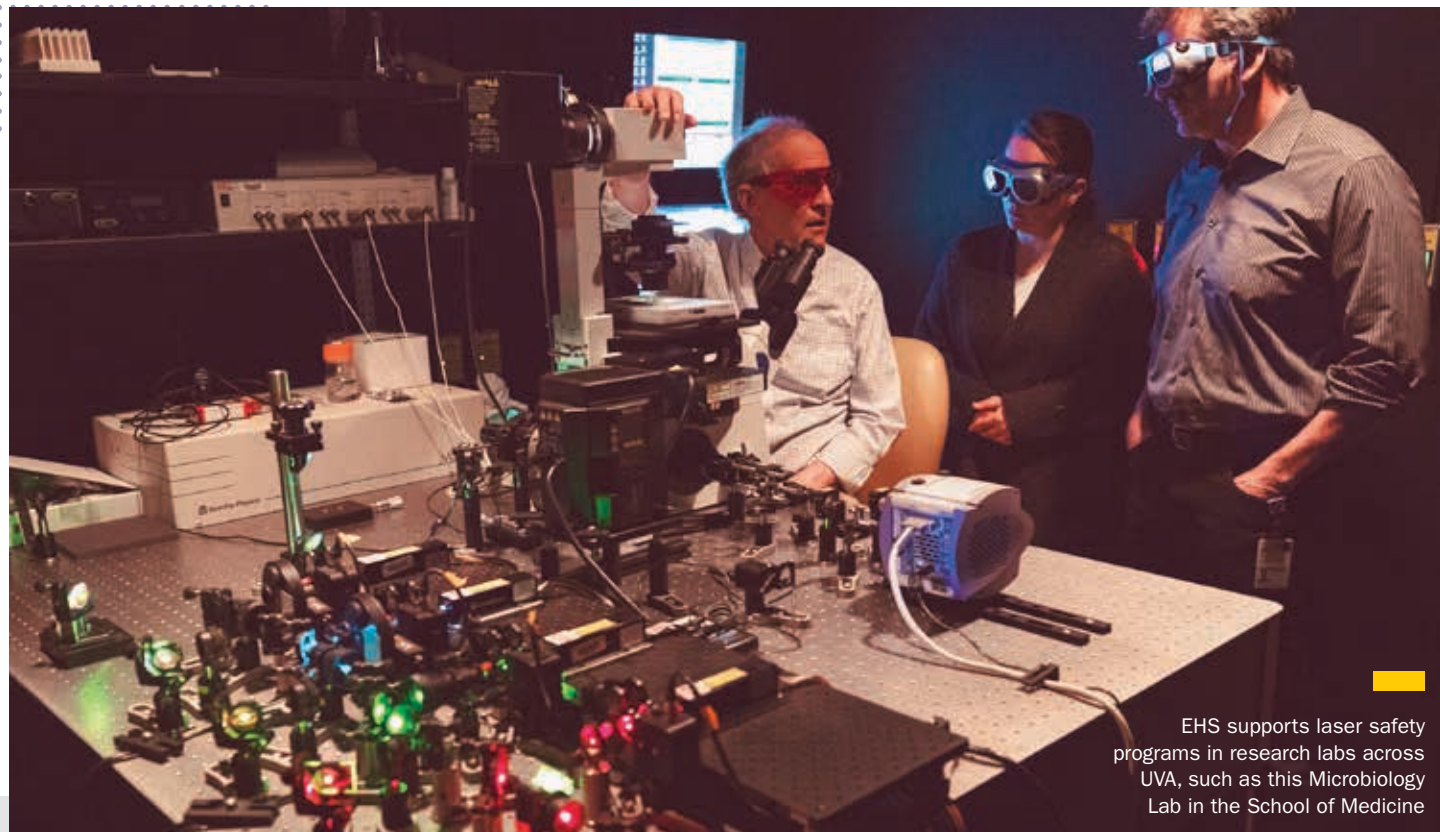
Marianne Story Yencken – Industrial Hygiene Supervisor, MS, CIH

Kristy Ann Davis – Industrial Hygiene Supervisor, MPH, CIH

Jennifer Lynn Cottingham – Senior Industrial Hygiene Technician, BS

PROFESSIONAL SAFETY ASSOCIATIONS, UNIVERSITY AND COMMUNITY COMMITTEE PARTICIPATION

- American Industrial Hygiene Association
- Campus Safety Health and Environmental Management Association
- Facilities Management HVAC Committee
- Facilities Planning and Construction and Health System Physical Plant
- Medical Center Equipment Work Group
- Radiation Safety Committee
- Albemarle County Schools Health Advisory Board



EHS supports laser safety programs in research labs across UVA, such as this Microbiology Lab in the School of Medicine

2017 ACCOMPLISHMENTS & SERVICE HIGHLIGHTS

• Workplace Consultations and Exposure Monitoring

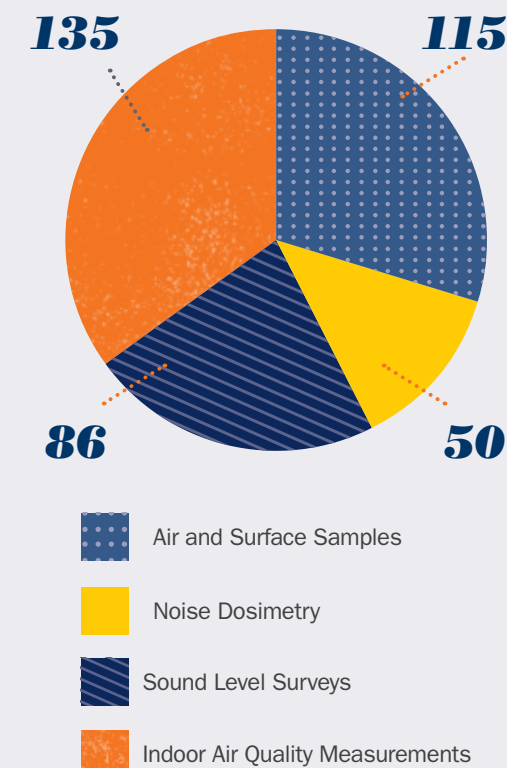


• Annual formaldehyde exposure monitoring for the School of Medicine

160 medical students in the gross anatomy class work with cadavers preserved in a solution containing formalin. Annual exposure monitoring completed by the OH Team for the faculty and students ensures adequate control measures are in place and the University is in compliance with the OSHA Formaldehyde Standard.

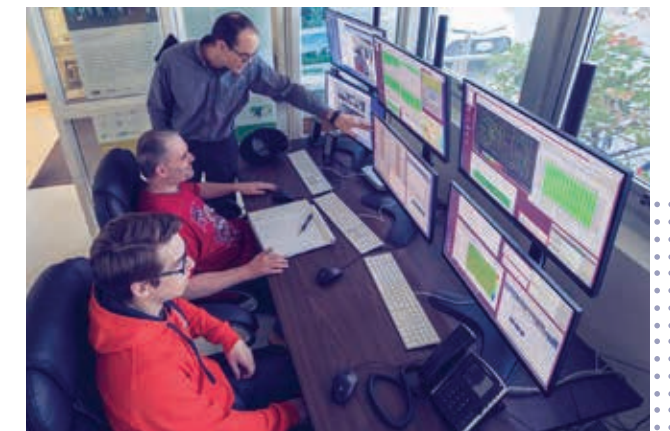


Workplace Exposure Monitoring



• Exposure monitoring for UVA Neutrino Researchers

UVA Neutrino researchers are scaling up their DOE funded research to pilot scale production here at UVA in partnership with the Fermi National Accelerator Lab. The EHS-OH Team provided exposure monitoring for epoxy resins used by research physicists to confirm exposure levels were within safe limits.



• **Laboratory Chemical Fume Hood (LCFH) Program & Laboratory Ventilation Reviews/Upgrades**

Management of the LCFH Program includes performance measurements and certification of 1088 hoods each year. The team oversees the ASHRAE performance testing of new hood installations to ensure proper operation.

- Continuous improvement in laboratory ventilation design last year included the introduction of Optima accessible hoods in accordance with the Americans with Disabilities Act (ADA).



• **Noise Measurements & Hearing Conservation**

Management of the UVA Hearing Conservation Program includes noise measurements, exposure control recommendations and training for various groups across UVA ranging from comparative medicine vivaria staff to hospital dishwashers to the UVA Pegasus Flight Crew.



• **Ergonomics**

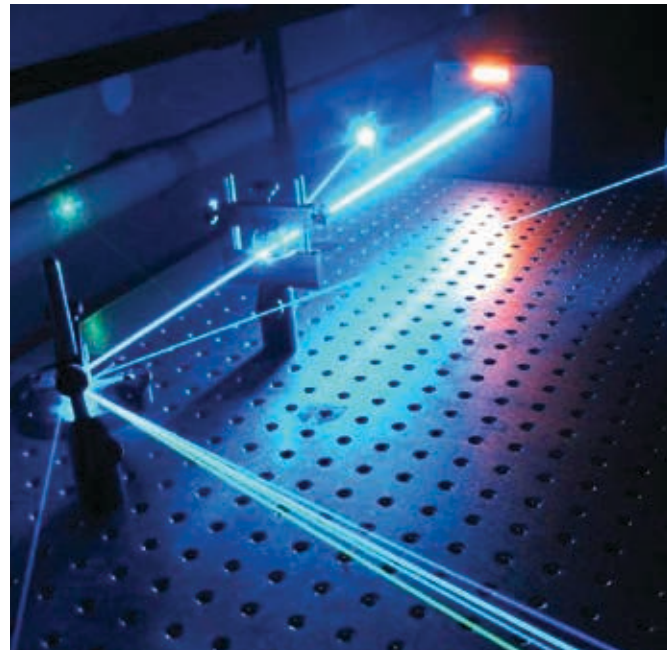
For the second year, the OH Team was there at the Hooswell UVA Health & Benefits Expo introducing office ergonomics to attendees. Office ergonomic assessments and group training programs are provided across Grounds.



• **Laser Safety**

In 2017 EHS introduced an online laser registry, providing researchers with a tool to register Class 1M, 2M, 3B and 4 lasers. The registry connects researchers and students to an online laser safety training program, documents training completion and generates a research group-specific laser safety manual.

As part of the laser safety program, the OH Team provided consultation on safe laser lab design to 28 research groups in 2017.



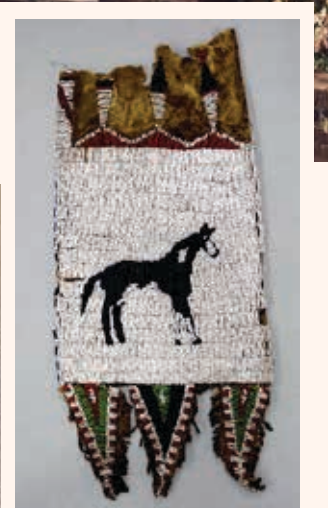
SPECIAL PROJECT

Fralin Art Museum Heavy Metals Exposure Assessment

The UVA Museum staff studies and cares for various collections of historic objects, including the 250 + Astor Family Collection of Native American artifacts.

Instrumental analysis and literature reviews indicate that many art objects may contain potentially hazardous substances, such as heavy metals (arsenic, mercury, and lead) and organic chemical residues. The hazardous substances may be inherent in the object as an original material of construction (dyes or minerals) and/or added during early 20th century treatments with heavy metal-bearing pesticides and preservatives.

The OH team worked with the Art Museum Collections Manager to review work practices that could release heavy metals from the art objects into the workplace. The OH team sampled surfaces for residual heavy metal contamination and performed air monitoring for mercury. This team effort determined safe levels were present and generated new recommendations to minimize potential contact with heavy metals in the future handling of these special art objects.



▲ Native American, Plains Region, Lakota artist
-Moccasins, early 19th century
-Buckskin or cowhide and glass beads, 13 1/2 x 6 1/2 x 1/2 in.
-Gift of Lady Nancy Astor, 1937.5.64

▲ Native American, Plains Region, North and South Dakota, Lakota artist (possibly)
-Pipe Bag with Horse Imagery, ca. 1880 - 1900
-Leather and beads, 11 1/2 x 4 1/2 in.
-Gift of Lady Nancy Astor, 1937.5.104.a-b



“ Thank you all for your time on Friday at Millmont looking at our collections storage and discussing a plan for selective environmental testing, safety training, and protocols for the handling and study of potentially toxic collections items. It was very informative and helpful. ”

– Leah Sterns, Fralin Art Museum Collection Conservator

FIRE SAFETY & PREVENTION

The fire safety team reaches across the University community to promote fire safety and compliance with Virginia Fire Prevention Code. Beginning with students, the group conducts fire safety training for resident advisers, performs safety inspections of all residence halls and oversees the completion of dormitory fire drills mandated by the state. Throughout the year, various student organizations and activities require involvement of the fire safety team, providing recommendations and guidance for events such as Brown College Hauntings and Lighting of the Lawn. Additionally, the Fire Safety team provides outreach and training for students residing in off-campus housing. The fire safety group inspects all University buildings (with the exception of the hospital and Medical Center) including those associated with research programs, manages the University's tent permit program, and assists with the development of and training on evacuation and fire safety plans on Grounds.

Fire safety staff are actively engaged in the planning and support for most major events, including graduation ceremonies, athletic events, concerts and dignitary visits. In addition, fire safety staff provide training on fire extinguishers and the use of the fire places in the Lawn and Range rooms, as well as offering fire safety training to employees, student groups, fraternities and sororities. The fire safety group coordinates regularly with the State Fire Marshal's Office, the Charlottesville Fire Department and the Charlottesville Neighborhood Development department to develop and manage planning, emergency response and training programs.

TEAM MEMBERS

- Gerald Drumheller** – UVA Fire Marshal
- Britt Grimm** – Senior Fire Safety Inspector
- Doug McGlothlin** – Fire Safety Inspector
- Clinton Wingfield** – Fire Safety Inspector
- Delphine Najeeullah** – Fire Safety Assistant

SELECT UNIVERSITY AND COMMUNITY PARTNERS

- University Buildings Official (UBO)
- University Police (UPD)
- Office of Safety & Emergency Preparedness (OSEP)
- Facilities Management
- Medical Center Fire Safety
- Dean of Students
- Athletics
- Office of Major Events
- Housing and Residence Life
- Charlottesville Fire Department (CFD)
- Albemarle County Fire Department
- Albemarle County Police
- Charlottesville Police
- State Police
- City Neighborhood Development Services
- State Fire Marshal's Office (SFMO)
- RMC Events



Each year the EHS Fire Safety Team provides "courtesy" fire safety inspections in Residence Halls.



Delphine Najeeullah, Fire Safety Assistant, trains on proper fire extinguisher use.



Clinton Wingfield, EHS Fire Inspector, provides fire place safety training for lawn residence.

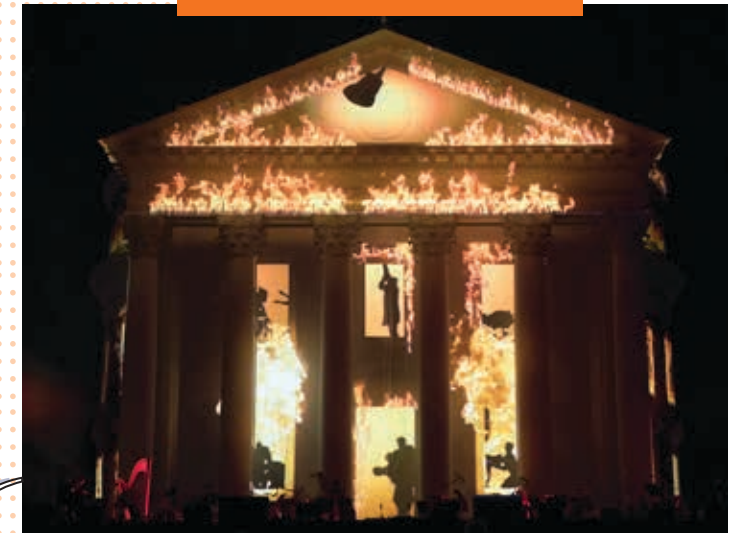
PROFESSIONAL SAFETY ORGANIZATIONS, UNIVERSITY AND COMMUNITY COMMITTEES:

- Virginia Fire Prevention Association (VFPA)
- Center for Campus Fire Safety
- National Fire Prevention Association (NFPA)
- Virginia Building Code Officials Association (VBCOA)
- Institutions of Higher Education (IHE) – Fire safety members from all Virginia Colleges and Universities.
- UVA Safety and General Security Committee
- Property Maintenance Committee comprised of University, City and County representatives

2017 SPECIAL PROJECTS

- Bicentennial Celebration
- A Concert for Charlottesville
- Enhanced security for Major Events
- Cooking Hood Inspection Program

BICENTENNIAL CELEBRATION



Though they let us burn down the Rotunda in 3-D projection, they made sure nothing burned for real! Fire safety and the UBO office created an egress plan that ensured safety for all. They've been on the ground reviewing structures since load-in began. Thank you for your patience and your protection of this place."

– Bicentennial Event Team

ASBESTOS & LEAD SAFETY

The purpose of the asbestos and lead safety program is to prevent harmful exposures to asbestos and lead, and support university compliance with Virginia and federal regulations regarding the proper management of asbestos-containing building materials and lead-containing paints.

REGULATORY REQUIREMENTS

OSHA and EPA regulations require the proper management and disposal of asbestos and lead during renovation, demolition, and maintenance activities.

EHS provides sampling and analysis necessary to identify these materials in buildings. We design remediation efforts, monitor abatement activities, and determine disposal requirements in accordance with Virginia Department of Environmental Quality requirements. EHS asbestos and lead professionals routinely partner with UVA Facilities Management, the Medical Center, and Housing and Residence Life staff in providing training, consultation, and “turn-key” service for all aspects of asbestos and lead, including:

- Pre-renovation, pre-demolition, and pre-maintenance asbestos and lead surveys
- Asbestos and lead paint project designs
- Regulatory interpretations and consultations
- Monitoring services for asbestos and lead activities
- Recordkeeping for asbestos and lead paint activities

We also work closely with private engineering and design firms and abatement contractors.



Marlin Phillips, EHS Asbestos and Lead Manager, analyzing asbestos samples.

QUALIFICATIONS

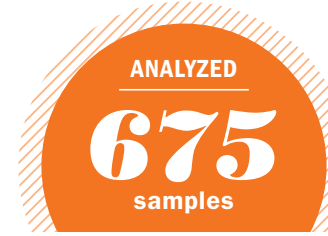
Marlin Phillips and **Andy Richmond** are licensed through the Virginia Department of Professional and Occupational Regulation (DPOR), possess EPA certification, and are members of the Environmental Information Association and the American Industrial Hygiene’s Proficiency Analytical Testing program for air sample analysis.

In 2017 our Asbestos and Lead Safety Program inspected, designed, and monitored:

- 6** complete building renovations
- 11** large renovation projects
- 52** small-scale asbestos removal projects
- 50** operations and maintenance activities
- 2** mold remediation projects
- 1** bird waste removal projects



for asbestos/lead analysis at an accredited third party laboratory



collected during and after asbestos remediation activities “in-house”, saving the university thousands of dollars



- Partnered with Facilities Management Occupational Health and Safety division in collecting OSHA required air samples during lead paint activities.
- Assisted with seven Virginia OSHA inspections of asbestos abatement contractors.

2017 SPECIAL PROJECTS

- Conducted a comprehensive asbestos assessment of University Hall (below) and Onesty Hall, in preparation for the planned abatement and eventual demolition of the buildings.
- EHS asbestos and lead professionals partnered with Albemarle County and City of Charlottesville police departments in the development of lead safety protocols for a new indoor firing range.



EHS conducted a comprehensive asbestos assessment of University Hall.

INFORMATION TECHNOLOGY



The EHS Information Technology (EHS-IT) team provides support and customized solutions for pan-university programs and initiatives related to safety, research compliance, education and hazardous materials management.

Customized relational databases and web applications have been developed by EHS-IT to help users capture, store, report and share data between programs and committees in a highly efficient manner. The information available through these integrated web applications form the core of research and safety compliance data for the University.

EHS-IT PROVIDES DIRECT SUPPORT TO THE FOLLOWING UNIVERSITY OFFICES, COMMITTEES, AND PROGRAMS

- Office of the Vice President for Research (VPR)
- Environmental Health & Safety (EHS)
- Center for Comparative Medicine (CCM)
- School of Medicine (SOM)
- Institutional Biosafety Committee (IBC)
- Institutional Animal Care and Use Committee (IACUC)
- AAALAC Occupational Health Subcommittee
- Radiation Safety Committee (RSC)
- Radioactive Drug Research Committee (RDRC)
- Human Research Protection Program (HRPP)
- Molecular Imaging Core (MIC)
- UVA WorkMed & Student Health Services

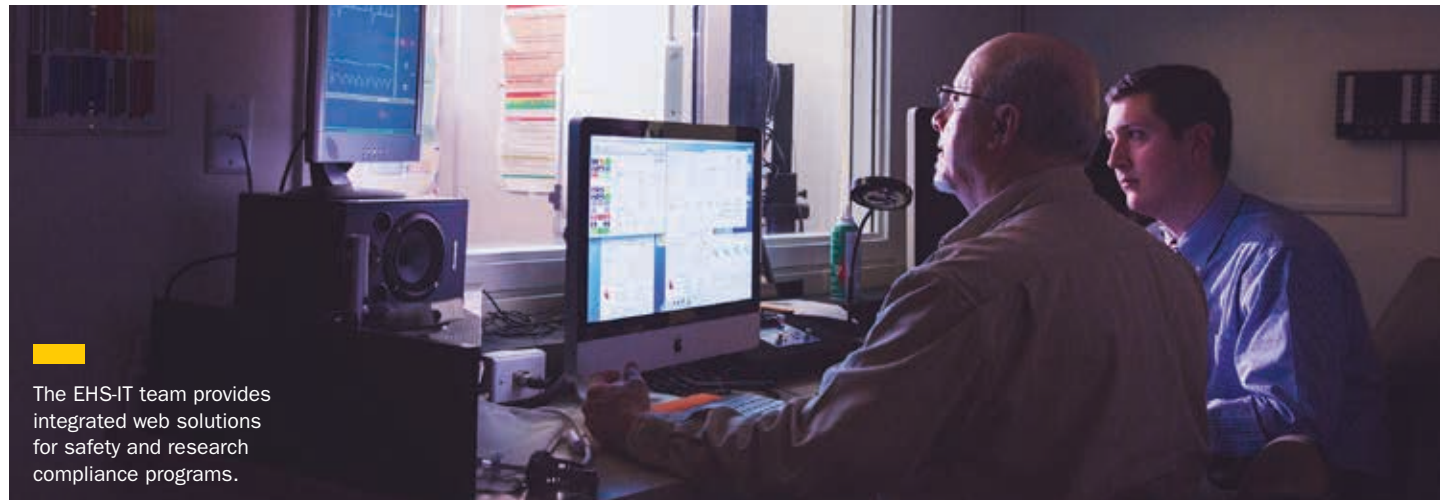
TEAM

The EHS-IT team is led by the Chief Technology Officer for the Office of the Vice President for Research (CTO-VPR) and is comprised of the following staff:

- Vaughn C. Kowahl** — EHS Assistant Director & CTO-VPR
- Jeffrey Gill** — Web Developer
- John M. Grachus** — Instructional Designer & Content Developer
- Annette Liskey** — Web Developer
- Richie Santos** — Computing Systems Administrator
- Dean Schlemmer** — Computing Systems Administrator & Content Developer

Shared and managed data

- 198** Training Modules (134 available online)
- 1,387** persons who require annual Research Related Medical Health Assessments
- 1,299** persons who require annual Bloodborne Pathogen Training
- 1,919** Hazard Communication Door Signs
- 411** PIs have approved IBC research protocols
- 240** PIs have 393 protocols approved by IACUC



The EHS-IT team provides integrated web solutions for safety and research compliance programs.

ADMINISTRATIVE



The EHS administrative team supports operational and transactional functions of the office including finance, budget, and human resources. Staff strive to foster productive, respectful and trusted working relationships across the University community.

ADMINISTRATIVE AND OPERATIONAL SUPPORT SERVICES

- Committee support (e.g. Radiation Safety Committee, Radioactive Drug Research Committee, Hazardous Materials & Waste Work Group, AAALAC Occupational Health Subcommittee).
- Management of financial transactions; procurement; vehicle fleet maintenance; building maintenance; office equipment; travel.
- Liaison to Human Resources and management of departmental timekeeping, hiring committee support, and performance management.
- Procurement of radioactive material for medical center (patient care) and academic (research) applications.
- Assist in communication between EHS and the UVA community

TEAM

- Ginger Houchens** — General Administration Supervisor
- Kristen Crawford** — Administrative Assistant

RADIOACTIVE ORDERS PROCESSED, 2017:

421

Hospitals: 130, Academic: 291

EHS TRANSACTIONS PROCESSED, 2017:

436

Purchase Orders: 370, Committee Support: 20, Travel Reimbursements: 19, Standing Orders: 15, Pay Vouchers: 12

FUTURE DIRECTIONS

Environmental Health and Safety attentively monitors the goals of University research, patient care, educational programs to align our services with the direction and future needs of the University community. Some of the more impactful influences are noted below.

RESEARCH GROWTH: The Vice President for Research and Provost have identified aggressive targets in expanding research funding over the next several years, and this growth is likely to impact EHS and other support infrastructure services in numerous ways. EHS must continue to invest in efficient and effective means to provide safety training and information; consultation and inspections; protocol review, and accommodate growth in hazardous materials handling and disposal services.

EXPANSION INTO NORTHERN VIRGINIA: The new Health System partnership with **INOVA** will require thoughtfully constructed and innovative ways to ensure the safe, compliant function of research activities in northern Virginia. Partnerships and contract services are under exploration to effectively manage hazardous materials use in a new geographic location. For example, a tentative agreement has been established for INOVA Health System to extend their radioactive materials license to cover radioactive materials use within the **Global Genomics & Bioinformatics Research Institute**.

MAKER SPACES are areas where students can access equipment such as 3D printers, laser cutters and traditional power tools that allow them to design, create and develop prototypes that extend beyond

the conventional mechanical shop environment. At UVA, we have at least 19 maker spaces spread across 4 schools, with more envisioned in the future—the collective group of faculty, staff and students who engage in these spaces refer to themselves at the **Makergrounds community**. EHS will continue to partner with the **Makergrounds safety workgroup** to examine makerspace safety considerations and develop programs designed to manage risks such as access policy; training on the safe use of equipment and tools; and facility oversight.

EHS FACILITY NEEDS ASSESSMENT: EHS facilities are at capacity, worn, and yield inefficient operations for waste handling and storage. In order to accommodate EHS infrastructure needs, the University has initiated a study with the assistance of a national consultant to explore future facility options.

ADDITIONAL CONSIDERATIONS: Increased radiation safety support is anticipated as novel radioactive imaging agents are developed for health care. A new **PET/CT machine** has been installed at Fontaine Research Park and numerous clinical studies involving use of radioactive imaging agents are planned for this facility. A new clinical **Good Manufacturing Practices (cGMP) facility** is under development to advance immunotherapy and clinical research. The cGMP facility is governed by Food and Drug Administration regulations and EHS staff will assist SOM in the development of certain facility procedures and operations. EHS hazardous materials management team will continue to implement measures to comply with the recently adopted **EPA hazardous waste generator improvement rule.** ■

