

# Environmental Health and Safety

Annual Report 2018-2019

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Assistant Vice President  
**A. David Inyang**



“ Welcome to the EH&S 2019 Annual Report. Thank you for taking time to consider all the achievements of the EH&S team. Our professional staff is dedicated to the mission of preventing illness and injury, protecting the environment, and connecting the university to the message of safety and preparedness.

As we enter the midpoint of our 2017-2022 Strategic Plan, this report is an opportunity to reflect on our success and consider opportunities for improvement. After reviewing the report, I invite you to share your thoughts with me so we might continue to sharpen our vision of a safe and sustainable campus, community, and world.

A. David Inyang ”



# What's inside?

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## Our Mission

Prevent illness and injury, protect the environment, and connect the university to the message of safety and preparedness.



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### 2018-2019

Annual Report Website

Everyone. Home. Safely.

# Valued Connections

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## And We Have... Liftoff

The ISU rocketry club (CyRoc) very nearly had to cancel their appearance at the 2019 Spaceport America Cup in Las Cruces, New Mexico, because their advisor had taken ill. How does EH&S fit in the story? EH&S was participating in a Rocket Safety Symposium held in conjunction with the Spaceport America Cup. After some quick thinking, departmental cooperation, and a Dean's signature, EH&S was the temporary team advisor!

CyRoc team members cooperated with EH&S and even agreed to meet additional safety requirements, such as completing heat-related illness training. The College of Engineering and the convalescing advisor were updated throughout the event and CyRoc successfully launched and recovered their rocket. Will EH&S ever top such an adventure? We think it's gonna be a long, long time!



# A Class Act

While the move to online training has allowed greater flexibility for learners, classroom training remains a critical factor in our effort to prepare for events that may occur. From National Weather Service storm spotter classes to fire extinguisher training conducted with our Ames Fire Department partners, EH&S works to provide faculty, students, and staff a variety of platforms to support safe work, study, and play on campus.



Two examples of popular classroom trainings are CPR/AED/first aid and Laboratory Safety Orientation. The number of AEDs in campus buildings have grown significantly over the past several years. EH&S increased the number of class offerings to ensure those with an AED in their building had access to training.

Each August, EH&S teaches Laboratory Safety Orientation to incoming laboratory staff and graduate students. This half-day course covers required safety trainings and provides hands-on

experience with many different laboratory safety skills. These skills include operating a fire extinguisher, cleaning up a chemical spill, providing basic first-aid, assessing hazards, and writing standard operating procedures.

Classroom training remains an effective way EH&S carries out its mission of getting everyone home safely. In FY19, we offered 23 classroom trainings to 2,456 members of the ISU community attending.

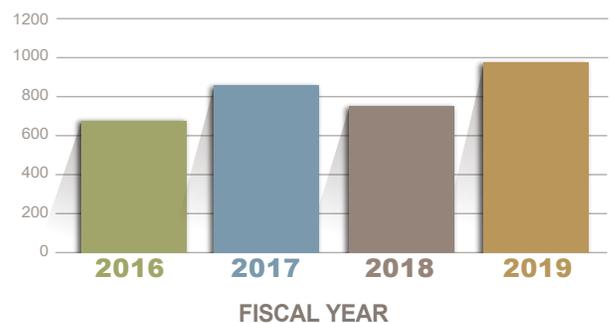
# To Dispose or Not to Dispose

Proper cleaning and disposal of laboratory equipment is important to ensure the health and safety of persons who may come in contact with the equipment. EH&S maintains a partnership with ISU Surplus to examine laboratory equipment that is non-functioning or no longer needed.

Potential hazards associated with laboratory equipment include asbestos, lead, biological agents, chemicals, and radioactive materials. Equipment owners are required to disclose known hazards associated with the equipment so that subject matter experts at EH&S can inspect and ensure proper disposal or safe re-use.

In FY19, EH&S evaluated 984 pieces of laboratory equipment, affixing blue tags to those determined to be safe for sale to the public through ISU Surplus.

LABORATORY EQUIPMENT EXAMINATIONS



# Roof Safety

Two years ago, EH&S established a partnership with Facilities Planning and Management (FP&M) to improve fall protection and worker safety on building roofs. The partnership created a risk matrix and developed a safety survey process to assess roofs on campus for safety and fall protection. In January 2019, improved roof safety standards were published in the FP&M Design Manual. These standards will help ISU eliminate fall hazards and improve roof safety through the design phase of new buildings, as well as remodeling of existing buildings.

To date, the roof safety partnership has resulted in the assessment of over 550 roof sections on 75 buildings. The partnership is currently working on the final phase of roof safety surveys with an anticipated total of 705 roof section safety surveys completed on 125 buildings. The risk matrix enables EH&S and FP&M to evaluate roof conditions and identify those roof sections representing the highest risk to workers, which helps prioritize improvements. Through this partnership, ISU has enhanced worker safety by investing over \$500,000 in fall protection and roof safety improvements.



# From Cradle to Grave

Due to the complex nature of radioactive materials (RAM) and associated rules and regulations, EH&S provides cradle-to-grave support to campus researchers. In other words, EH&S is involved when the RAM first arrives on campus, helps keep track of it while it's in the laboratory, and manages its safe disposal.



## The steps to this include:

1. All orders delivered to EH&S for inspection and inventory control.
2. EH&S delivers RAM to the researcher.
3. EH&S performs quarterly equipment checks to verify no contamination.
4. All waste/unused RAM picked up by EH&S and transferred to the Regulated Materials Facility (RMF).
5. EH&S segregates the waste by category and transfers it to a commercial waste broker for proper disposal off-site.
6. EH&S verifies that the RAM is properly managed at its disposal destination.

# Accredited Safety

EH&S and the College of Engineering have been actively working to improve the safety of students in teaching laboratories and student organization spaces. In the Fall 2018 semester, the College of Engineering hosted a team of peer evaluators from the Accreditation Board for Engineering and Technology (ABET) for the college's re-accreditation.



Computing &  
Engineering  
Accreditation  
Commissions

Through the re-accreditation evaluation process, the evaluators discussed the partnership's efforts on safety initiatives throughout the college, citing them as an institutional strength with the following comments:

“ A laudable emphasis on safety exists at the college level and percolates down through each program to each laboratory and each faculty member, staff member, and student. The existence of a dedicated College of Engineering safety staff, a formal Safety Commitment document, and a multifaceted active program that includes industry best practices such as 'no-notice' inspections makes Iowa State's approach to ensuring safety uncommon in academia. This dedicated focus on safety not only ensures the well-being of everyone associated with the College but prepares the College's students to enter the workplace. ”

# Prepared Campus

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## A little Help From Our Friends

Emergency management depends on having resources and personnel available during times of emergency. Iowa State University has adequate resources for managing our daily operations. However, significant public events like football games and presidential caucuses, as well as natural disasters like floods or tornadoes, can strain our personnel, equipment, supplies, and other assets. To address this challenge, EH&S, ISU Police, and other campus departments developed critical relationships with local, state, and federal partners to ensure the campus community's needs can be addressed with well-coordinated multi-agency responses.

Whether we're dealing with planned events or unexpected incidents, we're always thankful for all our partners in preparedness, response, and recovery.

To ensure our community's readiness, we regularly plan and train alongside many organizations, including:

- Ames Fire Department
- Ames Police Department
- Mary Greeley Medical Center
- Story County Emergency Management
- Iowa Army National Guard's 71st Civil Support Team
- Iowa Department of Homeland Security and Emergency Management
- Iowa Department of Transportation
- National Weather Service

# The Database that Could

Yes, it takes effort to submit and maintain chemical inventories. However, the database that EH&S hosts is used to meet multiple regulatory requirements and to support our emergency response partners during emergency events.



## Benefits of an accurate central inventory include:

- Emergency responders can be made aware of types and quantities of chemicals present in a university space during an incident. If a fire occurs, firefighters can determine the type of hazardous materials they may encounter before entering the space.
- EH&S staff can provide additional safety resources for materials with specific hazards, such as hydrofluoric acid or phenol.
- EH&S staff can inform the campus community of new regulations or requirements for a chemical present in their workspace.
- Maximum quantity limits can be maintained to ensure building code compliance and ability of buildings life safety systems to function as installed.
- Laboratories can collaborate. Reducing expenses of duplicate materials is good business practice. Labs in need of a small quantity of a specific chemical can request quantities from another laboratory instead of buying a larger container that would go unused.

# Safety Adventure(2)

In collaboration with ISU Well Being, EH&S has increased ISU employee safety awareness via the development of Adventure2 challenges. Over the past year, EH&S developed nine challenges, six of which were winter-weather related. Winter challenges included carbon monoxide safety, how to winterize your car, a winter car kit, where to park on campus during snow events, downloading a weather app for weather alerts, and how to safely walk on snow and ice.

IOWA STATE UNIVERSITY

## —ADVENTURE2—



## In the Background

Iowa State Football is “Purdy” fun for all! While thousands enjoy the ISU game day experience, EH&S works behind the scenes before, during, and after the games to ensure game day is as safe as it is enjoyable. Our responsibilities include inspecting the stadium, facilities, vendors, and construction. We assess everything, from the stadium's evacuation capacity in an emergency, to tripping, electric shock, and fire hazards.

We take a close look at cooking operations in the concession stands and food vendors on the concourses. We also ensure that propane cylinders are secured and that appropriate fire extinguishers (Class K) are present where frying occurs.

Did you know that EH&S, ISU Police, and Risk Management collaborate for the pyrotechnics shows? Representatives from each department review these visual effects and approve them for use.



# Health Matters

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## Rooms With a View

EH&S partnered with the ISU Department of Residence and Facilities Planning and Management to complete a “Life Cycle” project at Linden Hall, which was built in 1957. This project included replacement of old finishes with new paint, the addition of vinyl plank flooring and carpet, and installation of LED ceiling lighting in student rooms, hallways, and common areas. Linden Hall's original windows and doors also were replaced with new energy-efficient systems.



Before any renovation on campus begins, EH&S conducts a room-by-room survey to identify asbestos-containing materials and lead-based paint to prevent worker and resident exposure to hazardous materials during these projects.

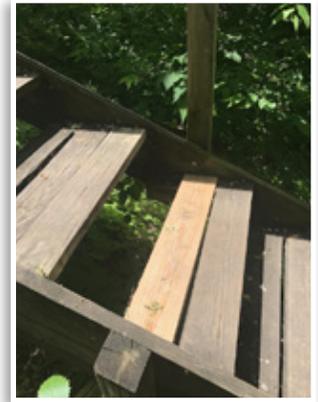
Over the course of this project, EH&S monitored the removal of asbestos and lead-containing materials resulting in a modern update to an important campus asset.



# Step in the Right Direction



An emeritus faculty member informed EH&S that a step was missing from a stairway on the ISU disc golf course, so EH&S staff immediately investigated. Upon finding the hazard, EH&S photographed the problem and reported the location to ISU Recreation Services. Following up the next day, EH&S was pleased to see that the missing step had already been replaced. The hazard had been identified, reported, and corrected in less than 24 hours, preventing a likely injury to our disc golf patrons!



## A Weighted Question

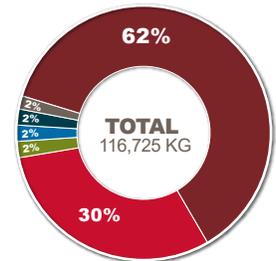
It's more than just dead animals, but only slightly more—10%, to be exact. The university's pathological waste incinerator is permitted to burn carcasses, animal bedding, and other tissues derived from research studies.

It is a vital part of ISU's teaching and research mission and is sustained through a partnership between the College of Veterinary Medicine, Facilities Planning and Management, and Environmental Health and Safety. When the university constructs a new Veterinary Diagnostic Laboratory, the facility will also house a new incinerator to provide continuing support well into the 21st century.

FIG. 2

### TYPES OF MATERIALS INCINERATED

<b>62%</b> 72,243	<b>OTHER ANIMALS</b> (NON INFECTIONOUS)
<b>30%</b> 34,773	<b>INFECTIOUS ANIMALS</b> (HMIW)
<b>2%</b> 2,937	<b>OTHER</b> (NOT INFECTIONOUS)
<b>2%</b> 2,409	<b>SEED/FEED/GRAIN</b>
<b>2%</b> 2,385	<b>CONTRABAND/ CONTROLLED SUBSTANCES</b>
<b>2%</b> 1,954	<b>NON-REGULATED ORGANICS</b>



### ORIGIN OF MATERIALS INCINERATED (TOP 12 DEPARTMENTS)

<b>42%</b>	<b>VETERINARY DIAGNOSTIC LABORATORY</b>
<b>28%</b>	<b>VETERINARY ANIMAL RESOURCES</b>
<b>9%</b>	<b>VETERINARY PATHOLOGY</b>
<b>4%</b>	<b>VETERINARY ANATOMY</b>
<b>4%</b>	<b>OTHER</b>
<b>3%</b>	<b>VETERINARY MEDICAL RESEARCH INSTITUTE</b>
<b>3%</b>	<b>IOWA STATE RESEARCH FARMS</b>
<b>2%</b>	<b>ENVIRONMENTAL HEALTH &amp; SAFETY</b>
<b>2%</b>	<b>VETERINARY CLINICAL SCIENCES</b>
<b>1%</b>	<b>AMES ANIMAL SHELTER</b>
<b>1%</b>	<b>MEAT LAB</b>
<b>1%</b>	<b>ANIMAL SCIENCE</b>

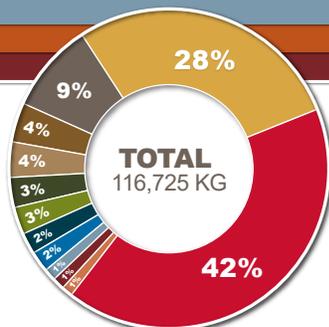


FIG. 1



## The Heat Is On

According to the Centers for Disease Control and prevention, approximately 650 people die from heat-related illnesses every year in the United States, and Iowa summers are known for being particularly hot and humid. To help prevent heat-related injuries, EH&S developed and launched a heat-related illness training module (available on Learn@ISU) in June. To date, 200 employees have completed this training.

Other initiatives designed to enhance employee safety and prevent heat-related injuries included a media campaign utilizing email, featured articles in Inside Iowa State and Adventure2 challenges related to heat stress.

## Herding Injuries

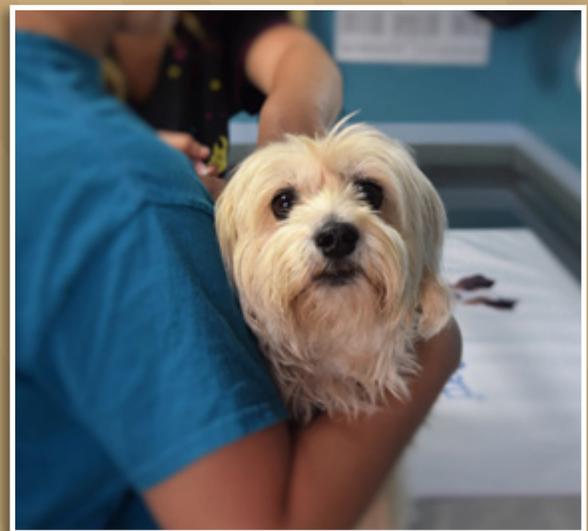
EH&S is responsible for reviewing and investigating reports of work-related injuries to employees, including injuries caused by animals. EH&S examined injury data from August 2016 to October 2018 and determined that on average, two animal workers at ISU were injured by animals each month.

For individuals who work with animals, ongoing education focused on enhancing communication with other staff, animal handling techniques, and safety culture in veterinary medicine may play a central role in reducing the likelihood of injury. EH&S is collaborating with animal handling personnel to develop solutions to this continuing challenge.

## A Data Driven Approach

EH&S is committed to utilizing an evidence-based approach to aid in injury prevention and has provided incident data analysis (at both the departmental and college levels) to numerous units on campus. Understanding the circumstances that lead to employee injuries has allowed us to work toward mitigating future injuries and enhancing employee safety. In fact, the number of reported employee incidents and OSHA recordable injuries has decreased by 10% and the number of corrective actions recorded as a result of incident investigations has increased by 10%, compared to the previous fiscal year.

In addition, based on the analysis of injury data, EH&S has developed several focus areas in an effort to mitigate employee injuries. These include animal-caused injuries, falls, slips on snow and/or ice, and injuries at ISU farms, laboratories, and shops. Injury prevention will always be a core EH&S mission. Working with our campus clients, we are taking strides to minimize injuries across ISU's diverse operations.



# Safety without Borders

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## A Radiating Success

ISU's Veterinary Clinical Services has a new tool to use in treating cancer and EH&S's Radiation Safety Group (RSG) played a key role in bringing it online. The new linear accelerator produces cancer-killing high-energy radiation for Stereotactic Radiation Therapy (SRT) treatments.

The RSG ensured worker and public safety before the SRT began treating patients. Three radiation safety specialists spent a couple of days certifying that the heavily shielded vault enclosing the SRT would contain all the radiation produced inside. EH&S personnel recorded approximately 1200 radiation meter measurements on all of the vault's walls and its ceiling. After confirmation of no excessive radiation outside the unit, the state permitted the facility to begin clinical operations.

To date, 23 patients have been treated, including a rat, several cats, and dogs. These patients were drawn from Iowa, Nebraska, Minnesota, South Dakota, and Illinois. Patients receive up to 20 treatments depending on the protocol; the majority receive five or less treatments. 143 radiation therapy treatments have been done to date.

# Batteries Are Included

In June, 2019, EH&S hazardous materials shipping specialists (HMSS) assisted the Des Moines Police Bomb Squad in conjunction with the State Fire Marshal's office in shipping a large lithium-ion battery that powers their bomb response robot. In recent years, the regulations for shipping most lithium batteries have changed frequently and become much more restrictive. EH&S routinely ships smaller lithium batteries from ISU and took on the challenge of shipping this large lithium-ion battery.

To expedite the shipping process, EH&S HMSS acquired additional training and coordinated compliance and billing with the ground shipping company. The battery arrived at its destination safely and EH&S HMSS acquired new skills and real-life experience with shipping hazardous high-energy lithium ion batteries.



# Safety Around the World

Iowa State University has had a program in Uganda's Kamuli District since 2004. The College of Agriculture and Life Sciences, Center for Sustainable Rural Livelihoods has partnered with several members of the local community to address hunger and poverty through agriculture, nutrition, and youth education. In July 2018, after donations from nearly 100 individuals, the Mpirigiti Rural Training Center opened as a place where education and training can occur for farmers, teachers, community leaders, and students. The 22,000-square-foot Center has a 48-bed student dormitory, rooms for faculty and visiting scientists, and demonstration areas for livestock and crop production.

A member of EH&S visited the Center in June 2019 to provide safety training and conduct health and safety inspections. She spent two and a half weeks working with the Center's staff addressing safety concerns and issues including fire safety, compressed gas cylinders, biosecurity and biosafety, and ergonomics. Additionally, she inspected the schools where ISU and Makerere University students have served more than 5,000 school lunches, the Nutrition Education Centers, which serve pregnant women and nursing mothers, and secondary schools where Ugandan students are enrolled in youth entrepreneurship programs.





# Just the Facts

2018-2019

## BIOSAFETY

<b>104</b>	Autoclave Tests	
<b>526</b>	IACUC Protocol Reviews	
<b>256</b>	IBC Protocols Reviews	
<b>250</b>	Biosafety Cabinet Certifications	
<b>1,171</b>	Shipments	
<b>95</b>	International	
<b>49</b>	FedEX Ground	
<b>78</b>	Tax-Free Ethanol Approvals	

## OCCUPATIONAL HEALTH

<b>20</b>	Ergonomic Evaluations Completed
<b>23</b>	Indoor Air Quality Investigations Completed
<b>171</b>	Immunizations administered by Occupational Medicine Office
<b>124</b>	Personal Exposure Monitoring Samples Collected
<b>1,289</b>	Hazard Assessments Completed
<b>1,272</b>	Medical Tests Completed
<b>1,887</b>	Active Participants in Occupational Medicine Program

## FIRE EXTINGUISHERS

<b>41,929</b>	Monthly Inspections	
<b>6,469</b>	Annual Inspections	
<b>605</b>	Six-year Inspections	
<b>364</b>	12-year Inspections	
<b>104</b>	Urgent Discrepancies*	

\* All urgent discrepancies closed within two business days

## RADIATION SAFETY

<b>58</b>	X-ray Systems in Use	
<b>88</b>	Laser Systems in Use	
<b>180</b>	Radioactive Material Packages Tested, Inventoried, and Delivered	
<b>189</b>	Laboratories Approved for Radioactive Material	
<b>513</b>	Radiation Safety Inspections Completed	
<b>1,366</b>	Pounds of RAM Waste	
<b>1,592</b>	Personal Dosimeters Issued and Analyzed	
<b>4,590</b>	Radiation Contamination Samples Collected and Analyzed	

## AEDS

<b>1,394</b>	Monthly Inspections	
<b>185</b>	Semi-annual Inspections	
<b>95</b>	Annual Inspections	
<b>33</b>	Battery Replacement	
<b>107</b>	Pad Replacement	
<b>4</b>	Urgent Discrepancies*	

\* All urgent discrepancies closed within two business days

## LAB SAFETY

<b>637</b>	Safety Inspections	
<b>976</b>	Safety Deficiencies Corrected	
<b>984</b>	Lab Equipment Disposal	
<b>1,205</b>	Fume Hood Certifications	

## TRAINING AND COMMUNICATIONS

<b>147,600</b>	Twitter Impressions	
<b>168</b>	Safety Publications <b>↑ 36%</b>	
<b>452,560</b>	Webpages Visited	
<b>83</b>	Safety Training Courses <b>↑ 9%</b>	
<b>Safety Training Courses Completed</b>		
<b>2,456</b>	Classroom	
<b>30,801</b>	Online <b>↑ 6.5%</b>	
<b>33,257</b>	Combined	

## ASBESTOS AND LEAD

<b>117</b>	Projects Managed
<b>187</b>	Bulk Samples Collected and Analyzed
<b>595</b>	Air Samples Collected and Analyzed
<b>\$1,217,773</b>	Dollars in Managed Projects

## ENVIRONMENTAL PROGRAMS

<b>18,905</b>	Hazardous Materials Packages Processed
<b>1,941</b>	Trips to Retrieve (EPA) Waste from Campus
<b>3,373.9</b>	Hours to Retrieve Waste from Campus
<b>195</b>	Rad Packages Removed
<b>2,164</b>	PCB Ballast Shipped (kg)
<b>5,103</b>	Non-PCB Ballast Shipped (kg)
<b>3,454.7</b>	Used Recycled

### Waste Incinerated by Type

<b>513.5</b>	Incineration Hours
<b>5,248</b>	Contraband (lbs)
<b>9,599</b>	Non-Regulated Organics and Seed/Feed/Grain (lbs)
<b>256,794</b>	Other (lbs)

### Other FY2019 Metrics

<b>43,924</b>	Fluorescent Lamps Recycled
<b>\$95.96</b>	Value of Used Oil Recycled
<b>\$23,854,545</b>	Street Value of Contraband Incinerated
<b>8.22</b>	Tons of Incinerator Ash Landfilled

## EMERGENCY MANAGEMENT

Member of Story County Local Emergency Planning Committee



<b>10</b>	Emergency Operations Center Activations
<b>156</b>	AEDs Installed Across the University
<b>2,231</b>	Emergency Response Training Completions
<b>4,803</b>	Safety Signs Installed and Inspected

## EH&S RESPONSE TIME FOR UNWANTED MATERIALS

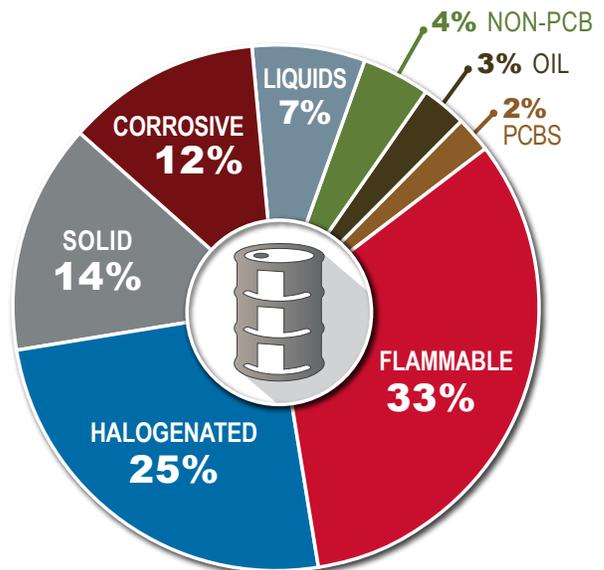
**50%** ..... within 3 days  
**70%** ..... within 5 days  
**90%** ..... within 8 days  
**99%** ..... within 20 days

### September

S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30					

Average = 4 days  
 Median = 3 days  
 Requests: 1,941

## HAZARDOUS WASTE DRUMS SHIPPED



## OCCUPATIONAL SAFETY

<b>6</b>	Buildings Modified for Fall Protection Improvements
<b>14</b>	Farm Safety Inspections Completed
<b>75</b>	Shop Inspections Completed
<b>113</b>	Confined Space Meters Calibrations
<b>250</b>	Roof Safety Inspections on 47 Buildings
<b>395</b>	Accident Investigations
<b>75</b>	CoE Teaching Lab Safety Inspections

### EMPLOYEE INJURY TYPES

