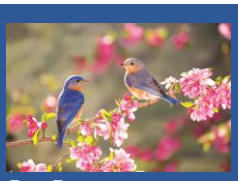
ENVIRONMENTAL HEALTH AND SAFETY



Lab Chatter

UNE UNIVERSITY OF NEW ENGLAND

INNOVATION FOR A HEALTHIER PLANET

Volume 3, Issue 7, April/May 2017

Table of contents:

Important Message from the UNE IBC

Submitted by Rachel Kasperek, Director of Research Integrity

The UNE Institutional Biosafety Committee (IBC) is continuing to update its policies in order to strengthen safety practices in biosafety research at the Institution and to ensure full compliance with the NIH *Guidelines*. All rDNA, select agent, infectious agent, and toxin research, teaching, and testing activities **must** be submitted to the UNE IBC for IBC review. In accordance with these requirements, all investigators, key personnel, and students involved in these activities are required to complete CITI training (Biosafety Complete Training Series course) to continue or begin approved IBC activities. Forms for protocol submission, including detailed instructions, are available on the IBC website (http://www.une.edu/research/compliance/institutional-biosafety-committee). To aid investigators in complying with these requirements, IBC Chair, Derek Molliver, IBC Administrator, Ivy Bergquist, and Director of Research Integrity, Rachel Kasperek, will hold Open Hours for investigators to stop in and ask any questions they may have on **Friday, April 14th from 8-11AM** in the **Pickus Lobby**. Please stop in to discuss any and all IBC matters - we're here to help!

Tips on Managing Laboratory Waste

By Ronnie Souza

Laboratory waste comes in a variety of forms. Knowing the correct disposal method and container for the waste you generate will keep you safe and the University in compliance with federal and state regulations. Laboratory trash may be disposed of in recycling, general trash, laboratory glassware boxes, sharps containers, or regulated medical waste boxes, or it may need to be managed as hazardous chemical waste, radioactive waste, or mixed waste.

Recycling

Empty glass containers and bottles, aluminum cans, most plastic containers and bottles, and paper can be recycled. University of New England has a robust recycling program. Check out the information at une.edu/recycle or contact the Sustainability office at extension 2507 if you need recycling assistance.

Empty chemical containers that contained hazardous materials must be triple rinsed and dried before submitted to recycling. Always collect the rinsed liquid and manage as hazardous waste. Empty solvent bottles must be completely dry before being submitted for recycling.

General Trash

Trash and rubbish from your general work area or the laboratory area that cannot be recycled may be disposed of via general trash as long as it is not regulated. Trash and rubbish that are contaminated become regulated wastes and require disposal via various methods i.e., laboratory glassware boxes, sharps boxes, regulated medical waste boxes, or the chemical waste program may be disposed of via trash. Housekeeping Services provides and manages small bins with liners for trash in all buildings.

Regulated Medical (RED BAG) Waste

Cultures and stocks of infectious agents and associated biologicals, human pathological waste, human blood and blood products, needles syringes and sharps, contaminated animal waste including carcasses, and isolation wastes from patients with highly communicable diseases are all required to be disposed of as regulated medical waste.

Sharps Containers

All razor blades and syringes are placed in regulated medical waste sharps collection/disposal systems, (i.e., sharps containers). Regulated medical sharps must also be placed in sharps containers. Regulated medical sharps are sharp or potentially sharp (if broken) items used in animal or human patient care or treatment or in medical research. Examples include but are not limited to hypodermic needles, syringes and their components, Pasteur pipettes, scalpel blades, blood vials, needles, acupuncture needles, culture dishes, glass slides and cover slips.

Laboratory Glass

Laboratory glassware, broken glassware, and Pasteur pipettes, slides are disposed of in laboratory glassware disposal boxes. Laboratory glassware is often made of tempered borosilicate glass or soda-lime glass and is not beneficially recycled. Laboratory glassware disposal boxes are disposed of in municipal waste landfills with trash. They cannot be contaminated with biological, radiological or hazardous waste. The boxes serve as a rigid outer container, minimizing risk of laceration or impalement to anyone handling the container. NEVER over-fill the boxes as this increases the risk of impalement.

Please see the waste chart on the next page for further guidance…

Waste Description	Best Place For:	Not Appropriate For:	Management Practice:
General Garbage/Recycling 	• Non-contaminated gloves, paper, chucks, general waste items • If the item is recyclable please assist our efforts in waste reduction	• Items that are biologically or radiologically contaminated. • Chemicals • Sharp objects including glass • Centrifuge tubes	• Collected by Housekeeping staff
Red Bag Lined Biological Waste Box 	• Infectious solids, such as petri dishes, contaminated gloves, chucks, etc. • Contaminated, unbroken glass objects free of liquids. • Bench top sharps containers	• General, uncontaminated trash as this is very expensive • Loose sharps and broken glass • Radiological contaminated items • Chemicals	• Container provided and removed by facilities via on-line Facilities work order • Laboratory staff must close and seal the box, then submit work order to facilities
Sharps Container 	• Needles • Scalpels • Razor blades • Pasteur pipettes • Contaminated broken glass or broken plastic	• Chemicals • Radiological contaminated items	• Never over-fill sharps container • Multiple sized containers provided and removed by EHS • Full Sharps Containers can go in Biological Waste box.
Glass Disposal 	• Uncontaminated glass (broken and unbroken) • Uncontaminated broken plastic objects • Uncontaminated plastic objects	• Biologically or Radiologically contaminated items • Chemicals • Fluorescent bulbs	• Provided by laboratory staff or department • Laboratory staff responsible to close and seal the box, then place a Maintenance Work Order when ready for pickup
Satellite Accumulation Area 	• Chemical Wastes • Chemical spill debris All federal and state Satellite Accumulation management rules apply	• Biologically or Radiologically contaminated items. • Sharps	• Lab personnel, with hazardous waste training, manage waste in accordance with regulations • Contact EHS for removal once containers are full
Radiological Waste Container 	Radiological contaminated items such as: • Gloves • Paper • Plastic • Bench chucks	• Liquids • Chemicals • Sharps • Lead Shielding • Radiological Sources	• Lab personnel must manage in accordance with Radioactive Materials License issued by the Maine Radiation Control Program.

Lab Security Awareness

By Jessica Tyre

Laboratories are unique work environments. Each lab has its own distinct research goals and protocols. There are different hazards in each individual space that can endanger someone who is not familiar with that lab space. It is vital that lab staff attempt to restrict access to UNE lab spaces and that only individuals with the appropriate level of training are allowed to enter. Not only can people sustain injuries if they are in the lab unnecessarily, but the research may be compromised if someone does not understand the nature of the work being performed in the lab.

Below is some information from Section 10 of the booklet "Prudent Practices in the Laboratory: Handling and Management of Chemical Hazards: Updated Version" from the National Center for Biotechnology Information.

Security risks to the laboratory include, but are not limited to:

- theft or diversion of chemicals, biologicals, and radioactive or proprietary materials (such materials could be stolen from the laboratory, diverted or intercepted in transit between supplier and laboratory, at a loading dock, or at a stockroom, and then sold or used, directly or as precursors, in weapons or manufacture of illicit substances);
- theft or diversion of mission-critical or high-value equipment;
- threats from activist groups;
- intentional release of, or exposure to, hazardous materials;
- sabotage or vandalism of chemicals or high-value equipment;
- loss or release of sensitive information; and
- rogue work or unauthorized laboratory experimentation.

There are four integrated domains to consider when improving security of a facility:

1. physical or architectural security—doors, walls, fences, locks, barriers, controlled roof access, and cables and locks on equipment;
2. electronic security—access control systems, alarm systems, password protection procedures, and video surveillance systems;
3. operational security—sign-in sheets or logs, control of keys and access cards, authorization procedures, background checks, and security guards; and
4. information security—passwords, backup systems, shredding of sensitive information.

What is at risk?

Biological Materials and Infectious Agents: Certain biological agents, including viruses, bacteria, fungi, and their genetic elements, are considered dual-use materials because of their potential for use by terrorists to harm human health. Biological materials pose a unique problem because these materials can replicate; thus, theft of even small amounts is significant. In the United States, these dual-use biological materials are called Select Agents and Toxins, and their laboratory use is regulated by the Centers for Disease Control and Prevention (CDC) and the U.S. Department of Agriculture's Animal and Plant Health Inspection Service (APHIS). Individuals planning to use Select Agents and Toxins are required to perform a security risk assessment (i.e., a detailed background check) to determine whether they are permitted to work with the materials. There are additional requirements for laboratory security, and the CDC or APHIS will conduct periodic inspections to assess compliance.

Research Animals: Animal research is the focus of numerous animal rights organizations, including some that have engaged in malicious behavior. Vivarium security is critical for the safety of animals and researchers. The Association for Assessment and Accreditation of Laboratory Animal Care International provides guidance for security of laboratory animals and research facilities.

Lab security continued…

Radioactive Materials and Radiation-Producing Equipment: In most laboratories, the quantity, isotope, and characteristics of radioactive materials used for research or teaching do not pose a serious dual-use risk. However, any radioactive materials can be perceived as a risk by the community. In the United States, use of radioactive materials is regulated by the U.S. Nuclear Regulatory Commission (USNRC) or USNRC-authorized state agencies. Compulsory guidelines for security are included in the requirements for licensing and use of these materials. Specific USNRC security requirements typically vary depending on the risk of the material.

Chemicals: Chemical security is garnering increasing attention from regulators. Most regulations that require specific security measures are aimed at facilities with large stores of materials—such as production facilities—rather than laboratory-scale quantities. However, federal, state, and local regulatory agencies are increasingly applying standards to chemical laboratories.

Drug Enforcement Agency Chemicals: Illicit drugs and their precursors pose a theft risk because of their resale (street) value. The U.S. Drug Enforcement Agency (DEA) has strict rules about procurement, inventory, use, disposal, and security of these chemicals. A person using materials regulated by DEA must obtain a user license or work under the direction of a person with such a license. The materials must be secured, with the level of security needed dependent on the classification of the material. Laboratories in which DEA-regulated materials are used must keep an inventory log that documents the quantity and date that any amount of material is removed, as well as a signature or other record to identify who removed the material. Once a DEA-regulated material has expired or is ready for disposal, it must be either destroyed or returned to the manufacturer or distributor. Destruction must render the material unusable and unidentifiable as the original agent and must be done by a person designated by the licensed user and witnessed by at least two people, one of whom, preferably, is a law enforcement officer. The destroyed materials must be disposed of in accordance with applicable laws.

DHS Chemicals of Interest (COI): DHS has promulgated regulations that apply to chemical facilities, including laboratories, with the purpose of keeping dual-use chemicals out of the possession and control of terrorists. The Chemical Facility Anti-Terrorism Standards are concerned with the following types of chemicals:

- EPA Risk Management Plan chemicals,
- highly toxic gases,
- chemical weapons convention chemicals,
- explosives, and
- pre-cursors of the above chemicals.

In the DHS process for determination of risk, all laboratory facilities are expected to survey their entire facility (including non-laboratory areas) for the presence of COI and compare their inventory to the threshold screening quantities established in the standard. If the facility meets or exceeds the threshold quantity for any chemical of interest, the facility must report the inventory by completing an assessment document called "Top-Screen." Upon receiving a completed Top-Screen, the facility is required to conduct a security vulnerability assessment. There are four risk tiers, with tier 1 for facilities posing the greatest risk and tier 4 posing the least risk. Based on the results of the assessment and the risk tier, the facility is expected to develop and implement an approved site security plan. There are also requirements for information security and training provisions under this rule. As of the time of publication, DHS was continuing to develop rules and guidance for chemical facilities, including laboratories.

Lab security continued…

The following is a partial list of issues to review as part of a Security Vulnerability Assessment:

- existing threats, based on the history of the institution (e.g., theft of laboratory materials, sabotage, data security breaches, protests);
- the attractiveness of the institution as a target, and the potential impact of an incident;
- chemicals, biological agents, radioactive materials, or other laboratory equipment or materials with dual-use potential;
- sensitive data or computerized systems;
- animal care facilities;
- infrastructure vulnerabilities (e.g., accessible power lines, poor lighting);
- security systems in place (e.g., access control, cameras, intrusion detection);
- access controls for laboratory personnel (e.g., background checks, authorization procedures, badges, key controls, escorted access);
- institutional procedures and culture (e.g., tailgating, open laboratories, no questioning of visitors);
- security plans in place; and
- training and awareness of laboratory personnel.

(***Resource:*** National Center for Biotechnology Information: https://www.ncbi.nlm.nih.gov/)

It is important to report any suspicious activity or unlawful entry in lab areas to UNE Security so that the proper authorities can be notified. If you or any of your lab staff notice anything unusual or anything that is missing from a laboratory area, it should be reported immediately.

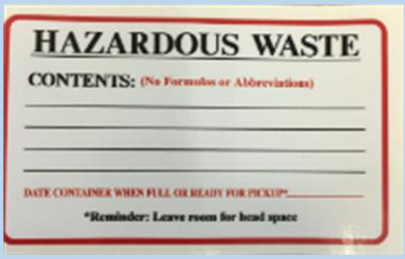
The Importance of Hazardous Waste Regulations

By Sam Hardy, EHS Intern

Under the EPA's RCRA management program, UNE has been categorized as a Large Quantity Generator (LQG) for the Biddeford campus and a Small Quantity Generator (SQG) for the Portland campus. This means that there are different regulations for each campus. On the Biddeford campus there are Satellite Accumulation Areas (SAAs) in most labs. These are locations for waste that is generated by that lab to be stored temporarily. When bottles become full or the SAA is no longer needed, waste is removed by the EHS department to the Main Accumulation Area (MAA) for storage until removal. In between the SAA being set up and the waste being taken to the MAA, there are responsibilities for the lab instructors or PI's.

SAA responsibilities include:

A. Container(s) should be labeled with the words "Hazardous Waste" and the following information is written and visible on the label:
   - Proper description of waste (No formulas or abbreviations)
   - Date on container when full.



B. Container(s) need to be completely closed with no loose lids.

C. Containers should not be leaking, bulging, rusting, or otherwise damaged.

D. Incompatible wastes cannot be stored in the same container.

E. Incompatible waste containers must be properly segregated.

F. Containers must be stored in secondary containment and on a firm working surface.

G. SAA must be located at the point of generation.

H. SAA must be under the control of an operator.

I. Weekly inspection must be completed every seven days.

J. Full, dated containers must be moved to the Main Accumulation Area within 72 hours.

Common Issues and Solutions

Loose caps

In the event of an official inspection by Maine DEP, even a cap that can turn one centimeter can be cause for an infraction. Always make sure to tighten caps completely after each use of the SAA. Reminding work study students or other researchers who use the SAA will be helpful in ensuring caps are always closed.

Not inspecting every seven days

The EHS department has noticed that most issues with not inspecting every seven days fall around holidays and breaks. If you will not be on campus the day your inspection is due, you can inspect a few days prior to the seven days, but you cannot go past seven days. If you will be away for more than seven days, a trained individual should be appointed to inspect the SAA for you. If this is not possible, you must write in the notes section the reason for the lack of inspection with the date. This will prevent confusion and penalty in the event of a possible official inspection.

Incompatible wastes that are not properly segregated

This is usually an easy fix. Often the most common issue is acids and bases being stored in the same bin. To prevent this, you can request a second bin from the EHS department to segregate incompatible wastes and prevent an unwanted reaction from occurring.

Hazardous waste continued…

To show how important compliance with these regulations is, we will provide examples of some fines issued to some nearby facilities:

Laboratory in Kennebec County, Maine
Violation(s): failure to properly identify hazardous wastes, failure to segregate incompatible hazardous wastes, and failure to follow its own procedures for the treatment of certain corrosive laboratory wastes in violation of the federal Resource Conservation and Recovery Act (RCRA) and state hazardous waste laws.

Penalty=$27,000

Wood Products Company in Oxford County, Maine
Violation(s): treating hazardous waste without a license, failure to label hazardous waste properly, failure to undergo hazardous waste closure certification, failure to adequately store universal waste, failure to label a container of universal waste properly, failure to keep track of the number of universal waste items at the facility, failure to mark containers of universal waste lamps appropriately, failure to file either an application for an individual waste discharge permit or a Notice of Intent form for coverage under the Multi-Sector General Permit Storm water Discharge Associated with Industrial Activity for discharges of storm water runoff, retaining an unlicensed asbestos abatement contractor, and failure to notify the Department in writing of the intention to engage in asbestos abatement activity, to comply with pre-abatement requirements.

Penalty=$17,500

Healthcare organization in Hillsborough County, New Hampshire
Violation(s): Failure to perform adequate hazardous waste determination, unauthorized disposal of hazardous waste, and failure to document a training program for hazardous waste management.

Penalty=$2,400

Source: http://stgermaincollins.com/2017/03/03/enforcement-actions-2016/

If you have any questions about UNE's SAA procedures contact UNE Environmental Health and Safety:

*Peter Nagle- (207) 602-2791, pnagle@une.edu

*Jessica Tyre- (207) 602-2046, jtyre@une.edu

State regulations can be found at: www.maine.gov/dep/

Hot Plate Safety

By Peter Nagle

Hot plates are a common apparatus found in UNE laboratories. They are primarily used for heating samples or inducing chemical reactions. Because of the work they do, there are intrinsic hazards associated with them. The most common accidents that occur are burns from handling hot objects or fires due to operator negligence, such as failing to shut off equipment after finishing their work.

There are also accidents that occur due to equipment failure. According to the Laboratory Safety Institute, power switch failure is the root cause of many incidents involving hot plates. Hot plates have unexpectedly caused several accidents in college laboratories that have resulted in extensive damage. In many of these incidents, users have reported that they have shut off the equipment after use. Both newer and older models have been reported to cause such incidents. For example, many older models have temperature dials that can be turned from "Low" to "Off" and continue rotating in the same direction to "High". Many accidents have happened because someone thought they had turned the plate off, but rather, rotated the dial inadvertently to the "High" setting.

Units manufactured before 1984 do not have temperature feedback controls and can spontaneously and rapidly heat beyond the set temperature while in the "ON" position. It is recommended that any hot plate manufactured before 1984 be replaced with a newer model. Newer models, though safer, are not without problems. With these units, turning them "Off" does not disconnect the heater from the electrical source. Internal processers keep running as long as the unit is plugged in. In the event of a firmware glitch, the unit can unexpectedly begin to heat even when both the temperature switch and the hot surface light are off.

As an additional safety precaution, EHS recommends that all hot plates be shut off and unplugged when not in use. Below is a list of safety precautions to follow when working with hot plates.

Safe Work Practices

- Make sure glassware is heat resistant
- Always inspect the hot plate before use. Do not use if:
    - Cords are worn, frayed or damaged
    - Grounding pin is removed or plug is damaged
    - Sensor is corroded or damaged
- Heat liquids slowly using the Medium or Medium/High Setting
- Carefully monitor the temperature of the substance being heated
- Do not leave a hot plate unattended when in use
- Use tongs or rubber coated heat resistant gripping devices to remove hot objects
- Do not use hot plate near volatile liquids
- Do not store volatile liquids near hot plate
- Check for corrosion of thermostats which can create a spark hazard
- Unplug hot plates when not in use; plates left on are the cause of most hot plate related injuries

OSHA FACT Sheet

Workplace Violence

What is workplace violence?

Workplace violence is violence or the threat of violence against workers. It can occur at or outside the workplace and can range from threats and verbal abuse to physical assaults and homicide, one of the leading causes of job-related deaths. However it manifests itself, workplace violence is a growing concern for employers and employees nationwide.

Who is vulnerable?

Some 2 million American workers are victims of workplace violence each year. Workplace violence can strike anywhere, and no one is immune. Some workers, however, are at increased risk. Among them are workers who exchange money with the public; deliver passengers, goods, or services; or work alone or in small groups, during late night or early morning hours, in high-crime areas, or in community settings and homes where they have extensive contact with the public. This group includes health-care and social service workers such as visiting nurses, psychiatric evaluators, and probation officers; community workers such as gas and water utility employees, phone and cable TV installers, and letter carriers; retail workers; and taxi drivers.

What can these employers do to help protect these employees?

The best protection employers can offer is to establish a zero-tolerance policy toward workplace violence against or by their employees. The employer should establish a workplace violence prevention program or incorporate the information into an existing accident prevention program, employee handbook, or manual of standard operating procedures. It is critical to ensure that all employees know the policy and understand that all claims of workplace violence will be investigated and remedied promptly. In addition, employers can offer additional protections such as the following:

- Provide safety education for employees so they know what conduct is not acceptable, what to do if they witness or are subjected to workplace violence, and how to protect themselves.
- Secure the workplace. Where appropriate to the business, install video surveillance, extra lighting, and alarm systems and minimize access by outsiders through identification badges, electronic keys, and guards.
- Provide drop safes to limit the amount of cash on hand. Keep a minimal amount of cash in registers during evenings and late-night hours.
- Equip field staff with cellular phones and hand-held alarms or noise devices, and require them to prepare a daily work plan and keep a contact person informed of their location throughout the day. Keep employer-provided vehicles properly maintained.
- Instruct employees not to enter any location where they feel unsafe. Introduce a "buddy system" or provide an escort service or police assistance in potentially dangerous situations or at night.
- Develop policies and procedures covering visits by home health-care providers. Address the conduct of home visits, the presence of others in the home during visits, and the worker's right to refuse to provide services in a clearly hazardous situation.

How can the employees protect themselves?

Nothing can guarantee that an employee will not become a victim of workplace violence. These steps, however, can help reduce the odds:

- Learn how to recognize, avoid, or diffuse potentially violent situations by attending personal safety training programs.
- Alert supervisors to any concerns about safety or security and report all incidents immediately in writing.

- Avoid traveling alone into unfamiliar locations or situations whenever possible.
- Carry only minimal money and required identification into community settings.

What should employers do following an incident of workplace violence?

- Encourage employees to report and log all incidents and threats of workplace violence.
- Provide prompt medical evaluation and treatment after the incident.
- Report violent incidents to the local police promptly.
- Inform victims of their legal right to prosecute perpetrators.
- Discuss the circumstances of the incident with staff members. Encourage employees to share information about ways to avoid similar situations in the future.
- Offer stress debriefing sessions and post-traumatic counseling services to help workers recover from a violent incident.
- Investigate all violent incidents and threats, monitor trends in violent incidents by type or circumstance, and institute corrective actions.
- Discuss changes in the program during regular employee meetings.

What protections does OSHA offer?

The *Occupational Safety and Health Act's* (*OSH Act*) General Duty Clause requires employers to provide a safe and healthful workplace for all workers covered by the *OSH Act*. Employers who do not take reasonable steps to prevent or abate a recognized violence hazard in the workplace can be cited. Failure to implement suggestions in this fact sheet, however, is not in itself a violation of the General Duty Clause.

How can you get more information?

OSHA has various publications, standards, technical assistance, and compliance tools to help you, and offers extensive assistance through its many safety and health programs: workplace consultation, voluntary protection programs, grants, strategic partnerships, state plans, training, and education. Guidance such as *OSHA's Safety and Health Management Program Guidelines* identify elements that are critical to the development of a successful safety and health management system. This and other information are available on OSHA's website at **www.osha.gov**.

- For a free copy of OSHA publications, send a self-addressed mailing label to this address: OSHA Publications Office, P.O. Box 37535, Washington, DC 20013-7535; or send a request to our fax at (202) 693-2498, or call us at (202) 693-1888.
- To file a complaint by phone, report an emergency, or get OSHA advice, assistance, or products, contact your nearest OSHA office under the "U.S. Department of Labor" listing in your phone book, or call us toll-free at **(800) 321-OSHA (6742)**. The tele-typewriter (TTY) number is (877) 889-5627.
- To file a complaint online or obtain more information on OSHA federal and state programs, visit OSHA's website.

This is one in a series of informational fact sheets highlighting OSHA programs, policies, or standards. It does not impose any new compliance requirements or carry the force of legal opinion. For compliance requirements of OSHA standards or regulations, refer to *Title 29 of the Code of Federal Regulations*. This information will be made available to sensory-impaired individuals upon request. Voice phone: (202) 693-1999. See also OSHA's website at **www.osha.gov.**

U.S. Department of Labor
Occupational Safety and Health Administration
2002

UNE Chemical Sharing Program

The UNE Chemical Sharing Program is a great way to reduce hazardous waste, reduce costs for your department, and have a positive environmental impact on campus. If you have any commonly used lab chemicals that you are thinking of disposing, please contact EHS so they can be listed in the next issues of EHS Lab Chatter as available for the UNE Chemical Sharing Program.

Chemicals currently available: None

Lab Safety Video of the Month:

UCLA Pipette Safety & Ergonomics Video

https://www.youtube.com/watch?v=bqAsXMSs27s

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