Funding Inventory Software

A centralized chemical inventory system currently does not exist at the University of Illinois. The Green Research Committee recommends the purchase of software to be used by all owners of chemicals on campus. A single inventory software system with an enterprise-wide contract would provide consistency across campus in chemical management. Inventory would reduce over purchasing, which results in less waste disposal. It would also allow campus to track materials for chemical use regulations and target areas where ventilation needs are minimal.

The impact this would have on sustainability, safety, compliance, and cost savings to the university is outlined below.

Waste

* Waste disposal costs have increased at a rate of about 2% per year. Recent years have shown how fragile the incineration industry in the USA is. Certain waste streams can suddenly double in cost based on to volatility of the industry.
  + Encouraging entry of only essential containers in the inventory system will drive up waste submissions initially. Pay now or pay more later. There is likely zero chance waste regulations will become less strict, so the materials will need to be disposed of as chemical waste, eventually.
  + Inventory can track chemicals before they expire and become “high hazard-unstable.” These chemicals cost the university $12/container to be stabilized on top of $575/day per person for the high hazard staff fee. Our permit requires stabilization by the waste vendor. This is on top of the typical waste cost of the container once neutralized. Two waste vendor employees neutralizing 100 containers in one visit costs $2350 for a single day of work. DRS usually schedules several high haz events a year.
  + Chemicals past expiration do not necessarily become unstable, however these chemicals often are left on the shelf for years, ultimately resulting in higher disposal fees as waste costs increase.

Purchasing

* Inventory prevents the over-purchasing of chemicals. Searching the inventory before purchasing will identify if the chemical already exists in your laboratory.
* Sharing
  + Laboratories may require the use of certain chemicals, frequently. Some experiments are exploratory and may only need milligrams for proof of concept. Inventory would allow the ability to search for the materials elsewhere on campus. Preventing the ordering of excess and then disposing or allowing it to be stored for an extended period of time.
  + Inventory can help identify age of materials and source which would impact decision to share.

Control Banding-Ventilation needs

* Inventory would allow campus to control band labs rather than having once size fits all for all laboratory space. This may result in spaces with lower ACH or fewer fume hood. The primary controls to prevent exposure to chemical vapors is chemical fume hoods and general lab exhaust. Both are large consumers of energy on campus.
  + Up-to-date inventory would identify areas of low hazards.
    - Potential to perform assessment and reduce air exchanges or velocity of hood. This would require additional resources, but is not an option without accurate inventory.

Chemical security/management/exposure regulations

* DHS (Department of Homeland Security) chemicals of interest (COI). Possession of DHS COI above a threshold must be reported to DHS. It is difficult to identify these areas without an accurate inventory. Buildings nearing the threshold will need to keep a closer eye on their chemical management practices. This is one reason the School of Chemical Sciences has invested in inventory software for their unit.
* This regulation looks at entire buildings and not individual lab groups. A campus inventory system will combine data for a building.
* OSHA regulations (Lab Standard, Hazard Communication Standard, Haz Material) require the management of chemicals to protect employees from exposure.
  + Regulations detail the need for access to Safety Data Sheets for chemicals used.
  + Hazard assessments, Standard Operating Procedures, training, etc. must be developed for all hazardous chemicals in the workplace.
  + Inventory allows
    - supervisors to target the specific training for employees.
    - Provide appropriate and compliant facilities to protect employees
    - Select proper controls for the activities
    - Allows safety units to target specific chemical users if there are communications regarding incidents, regulatory updates, new programs (safety, compliance, sustainability, accessibility).
* Building and Fire Code
  + Inventory can help manage quantities within the limits of fire and building code. This could be used to our advantage with the building insurers.
  + Building infrastructure is old and not in alignment with the code that allows great amounts of flammable/combustible chemicals. This is a risk/liability to the University.
* Clean Air Act “General Duty Clause” Clean Air Act Section 112(r)(1):  As an overarching protection against exposures to airborne hazards, facility owners/operators with regulated and other extremely hazardous substances must ensure their safe management (i.e., knowing the hazards, maintaining them safely, and minimizing the consequences of accidental releases). EPA enforcement has cited universities where chemicals are not inventoried and managed safely. (*This example found on haz waste forum*)

Emergency planning/response

* Inventory allows emergency responders to search a location and Safety Data Sheets during emergencies. Dozens of spills and fires occur each year in laboratories on campus. Emergency responders depend on information provided to them by the researcher and DRS. Inventory is one more tool for them to use to determine if entry into a facility has additional risks.
* Elimination of unnecessary hazards from a room or building will increase safety. There have been numerous incidents in recent history that involve containers that are past their expiration date or stored unnecessarily. Some were abandoned and discovered during cleanout.