



# Sustainable Lab Decommissioning

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# Learning Objectives

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- ❑ Identify the environmental, safety, and regulatory considerations involved in lab decommissioning
- ❑ How to incorporate sustainability into the lab decommissioning project
- ❑ Tips and tricks for successful decommissioning project
- ❑ Share lessons learned and sustainability metrics for continuous improvement for future lab closures.
- ❑ Communicate the value of sustainable decommissioning to lab users, leadership, and external partners.

# Introduction to Life Science Research Laboratories

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## Research & Development Laboratories:

- Bioanalytical Laboratories
  - Analyzing biomarkers
  - Developing Assays
- Therapeutic research and development work for treating:
  - Cancer
  - Metabolic disorders
  - Immune disease
  - Respiratory disorder



# Lab Layout



## Open Lab and Individual Labs

- Analytical Laboratory Instruments (LCMS, HPLC, Plate reader, centrifuge, Flow Cytometry instruments)
- Fume Hoods
- Biosafety Cabinets
- Glove Box
- Isolators
- Hazardous Waste containers
- Biowaste containers
- Flammable cabinet

# Site Layout

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## Centralized Storage for

- Hazardous Material (Key raw ingredients and chemicals/solvents/reagents are stored)
- Hazardous Waste
- Compressed Gas Cylinders
- Nitrogen Tank (if Applicable)

# Lab Closure news

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- Corporation will decide to relocate the lab
- Corporation teams will decide which lab equipment will stay and which will leave
- Unfortunately, as an EH&S, Lab ops and Facilities team you will be left with a ton of
  - Lab instruments
  - Lab consumables
  - Lab furniture
  - Engineering controls like biosafety cabinet and fume hood left behind



# Follow the local regulations

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Contact the county regarding the lab closure



Initiate the paperwork to close the hazardous material permit and medical waste permit among others



Submit a lab closure application ahead of time giving details on lab decontamination plan, lab decommissioning, sampling plan if any



## Lab Decommissioning - Expectation

Lab  
Decommissioning  
Reality





# Lab Decommissioning 101

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- Equipment that is left behind which will be auctioned off or donated – needs to be decontaminated first
- Work with your hazardous waste vendor to start consolidating and bulking hazardous material and reagents

# Circular Economy in Action

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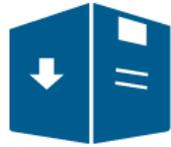
Site Assessment

A site walkthrough  
will be performed  
to take an  
inventory



Project  
Management

A project  
manager is  
assigned



Pack & Ship

Experienced  
technicians will  
decommission,  
crate and load all  
the instruments



Redeploy & Sell

Redeploy  
instruments to  
other facilities  
or  
sell on the  
secondary  
market

- They are surplus asset  
management companies

- Registered auction buyers

- Buy and sell used lab  
equipment

# Donation Option

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- Donate the lab instruments to local universities/schools if the legal teams approve the donation
- Some companies accept donations of lab equipment for distribution to scientists in developing countries



# Lab Donations

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- Lab instruments in good working condition were donated:
  - PCR
  - MSD Plate reader
  - DNA/RNA extractor
  - Liquid handler
  - Protein sequencer
  - Flow cytometer
  - Plate washer
  - Benchtop centrifuge
  - Cell counter
  - Mass spectrometer

Donate usable lab instruments and consumables to research institutions and startups

# Lab Items – Reuse/Repurpose/Recycle

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Metal racks from the freezers were recycled



Re-use/Repurposed hazardous chemicals internally

Diverted hazardous and non-hazardous waste from landfill through proper segregation



Clear and opaque plastics were recycled



Partnered with certified vendors for eco-friendly disposal and recycling

# Lab Decontamination

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- Bleach and isopropyl alcohol are used for lab decontamination.
- We were able to re-purpose the existing stock of isopropyl alcohol wipes, spray bottles and Clorox bleach
- Leftover Lab Gloves were donated to janitorial staff



# Key Takeaways



**Plan Early:** Integrate sustainability into decommissioning from the outset.



**Inventory Wisely:** Identify reusable, recyclable, and hazardous materials.



**Collaborate Broadly:** Engage EHS, facilities, vendors, and researchers.



**Minimize Waste:** Prioritize reuse, donation, and responsible recycling.



**Document & Communicate:** Maintain transparency and share lessons learned.



## In Conclusion: Sustainable Lab Decommissioning

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- Supports circular economy principles
- Helps to maintain zero waste certification
- Reduces environmental impact
- Enhances institutional reputation
- Aligns with ESG and regulatory goals

# Q&A

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