



Implementing a Multi-Site Environmental Management System at the NIH

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National Institutes of Health (NIH)

Department of Health and Human Services

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The NIH Mission



To seek fundamental knowledge about the nature and behavior of living systems and the application of that knowledge to enhance health, lengthen life, and reduce illness and disability.



NIH Locations



NIH Headquarters, Bethesda,
Maryland



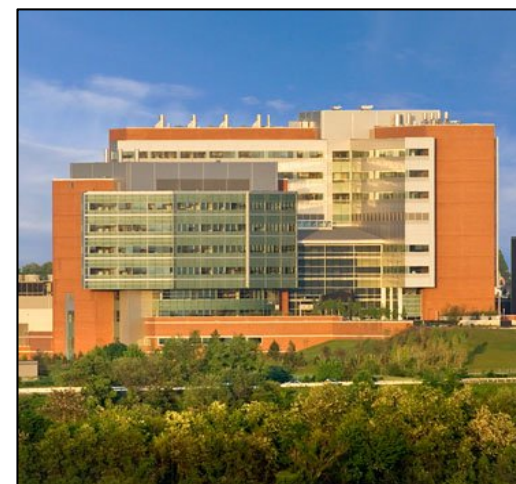
Frederick Cancer Research
Center, Frederick, Maryland



National Institute of
Environmental Health Sciences,
Research Triangle Park,
North Carolina



Rocky Mountain Laboratories,
Hamilton, Montana



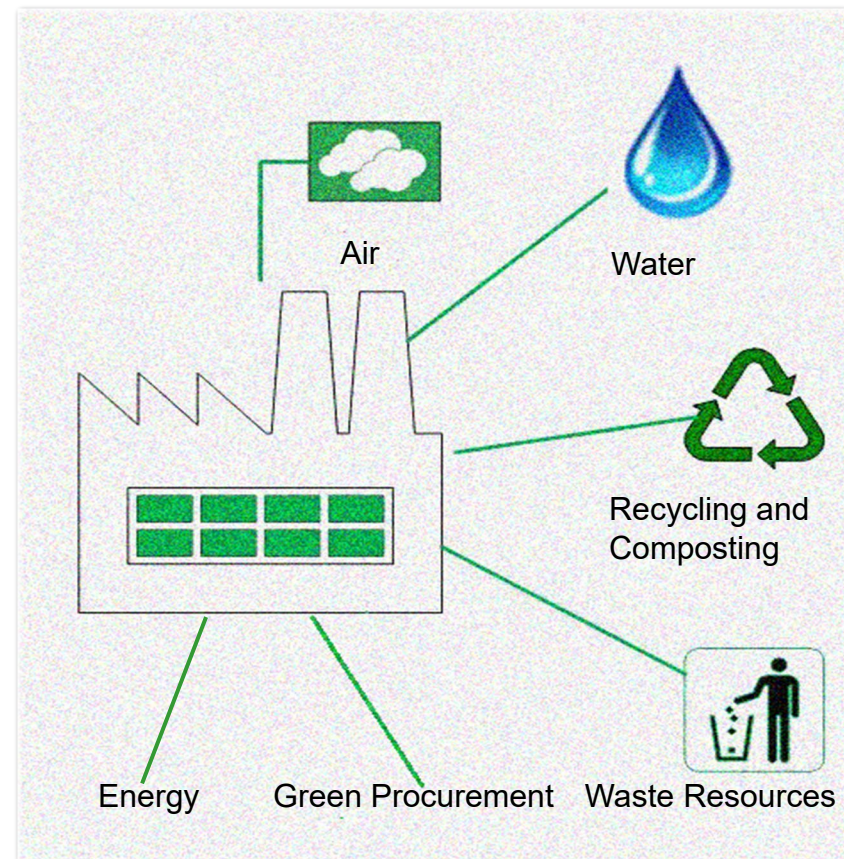
Bayview Campus, Baltimore,
Maryland

NIH Environmental Management System (EMS)

What is EMS?

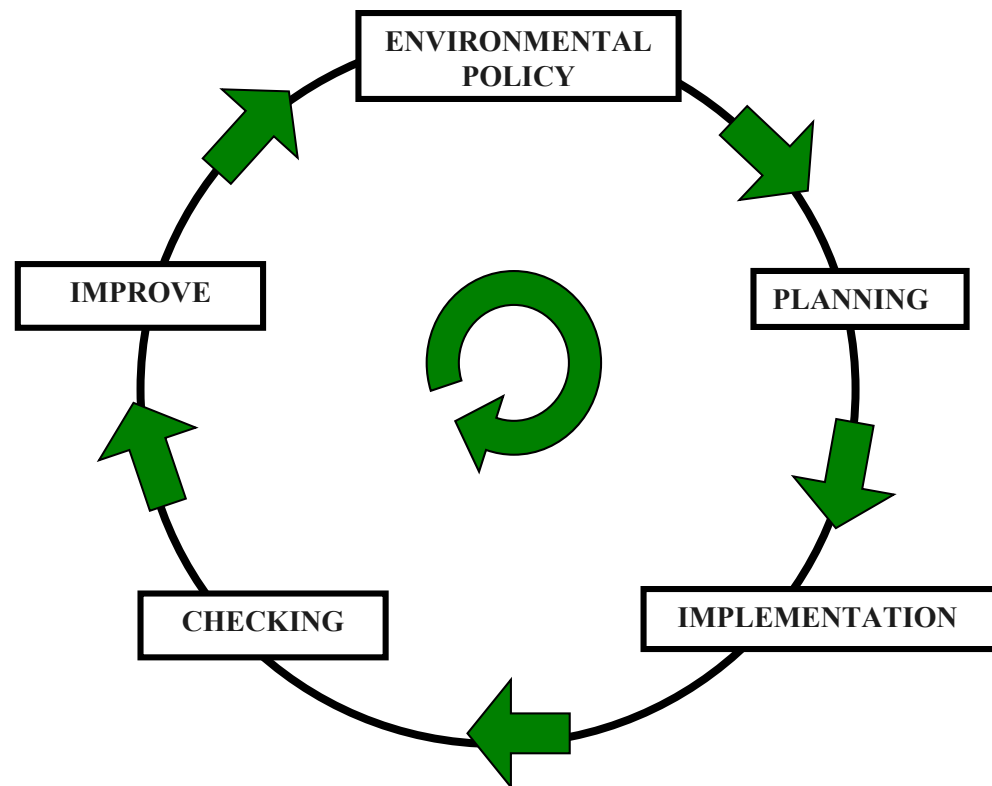
- Set of processes that enable an organization to:
 - establish goals;
 - set objectives;
 - measure outcomes; and
 - continue to improve.
- EMS is our tool for managing and achieving our environmental and sustainability goals.

2001 NIH initiated an Environmental Management System



Components of EMS per ISO -14001

- Context of Organization
- Leadership
 - Leadership and commitment
 - Environmental policy
 - Organizational roles, responsibilities, and authorities.
- Planning
- Support
- Operation
- Performance evaluation
- Improvement



Plan-Do-Check-Act Model



How does the NIH Implement a Multi-Site EMS?

- Follow federal guidance for environmental stewardship.
- Collaborate and partner with various NIH Institutes and Centers via working groups and meetings.
- Adhere to the environmental policy and EMS Framework (Refer to ISO 14001).
- Delegate organizational roles, responsibilities, and authorities for each location:
 - Meet compliance obligation of environmental programs
 - Manage the components of ISO14001, when possible
 - Create and promote outreach initiatives for NIH staff
 - Communicate with the Office of Research Facilities staff at NIH headquarters and the lessor (if it is a leased building)
- Conduct internal audits to continuously assess and improve programs.

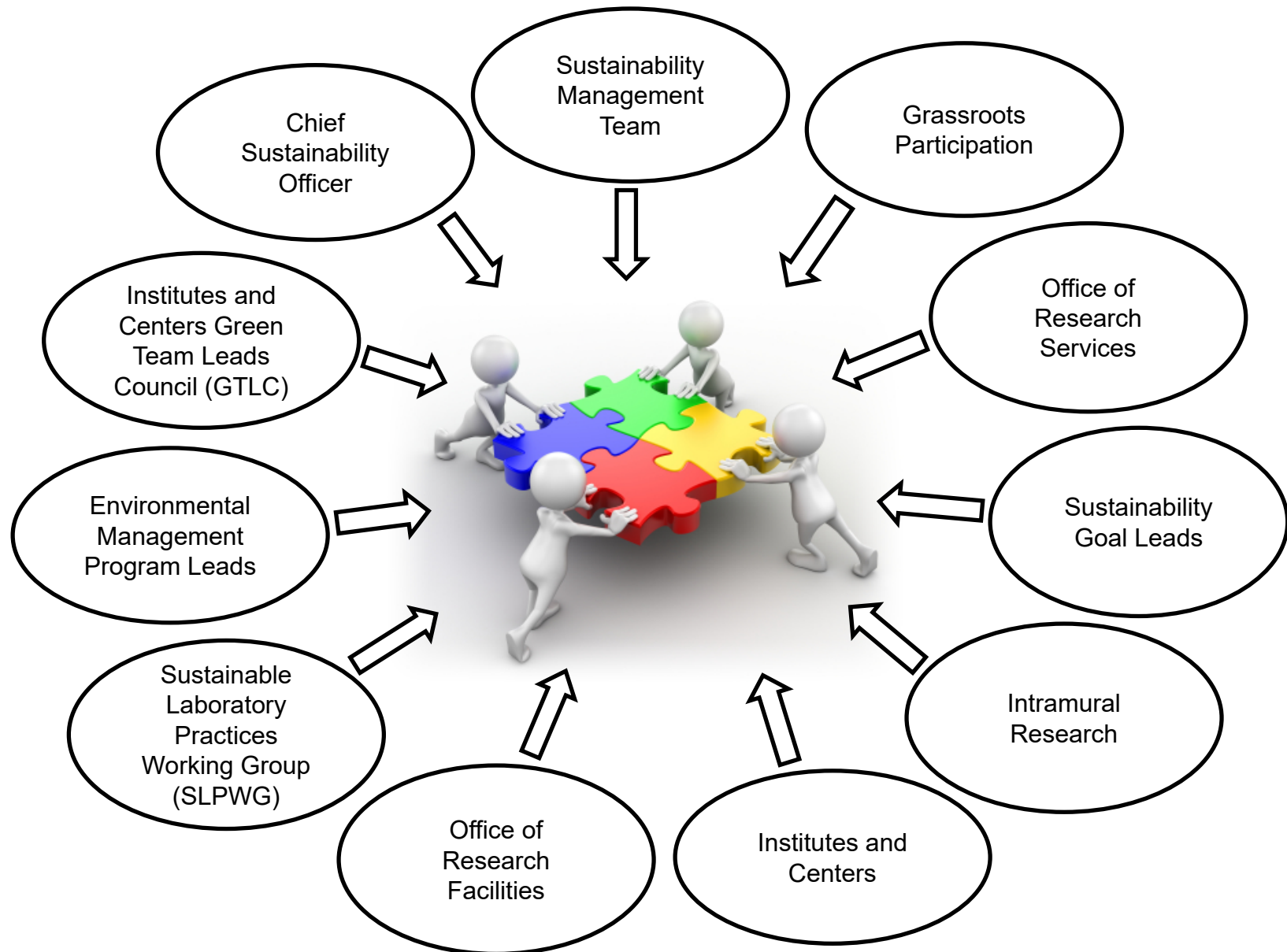


Federal Guidance for Environmental Stewardship & Sustainability

- **2000 - President Bill Clinton** - Executive Order (EO)13148 *Greening the Government through Leadership in Environmental Management* (*Required agencies to develop an EMS*)
- **2007 - President George W. Bush** - EO 13423 – *Strengthening Federal Environmental, Energy, and Transportation Management* (*Set targets for energy and water conservation, carbon footprint reduction, waste reduction*)
- **2009 - President Barack Obama** - EO 13514 – *Federal Leadership in Environmental, Energy, and Economic Performance* (*Required annual reporting on 10 Sustainability Goals and established targets for 2015*)
- **2015 - President Barack Obama** - EO 13693 – *Planning for Federal Sustainability in the Next Decade* (*Continued requirement for annual reporting and established targets for 2025*)
- **2018 - President Donald Trump** - EO 13834 – *Efficient Federal Operations* (*Required to manage buildings, vehicles, and overall operations to optimize energy and environmental performance, reduce waste, and cut costs*)



Partnerships and Support



EMS Approach

Step 1: Develop Aspect-Activity matrix

- Develop a list of operations, activities, processes, and services at the facility and assess their environmental impacts

Step 2: Manage Programs

- Determine, implement, and document the environmental management programs (EMP)

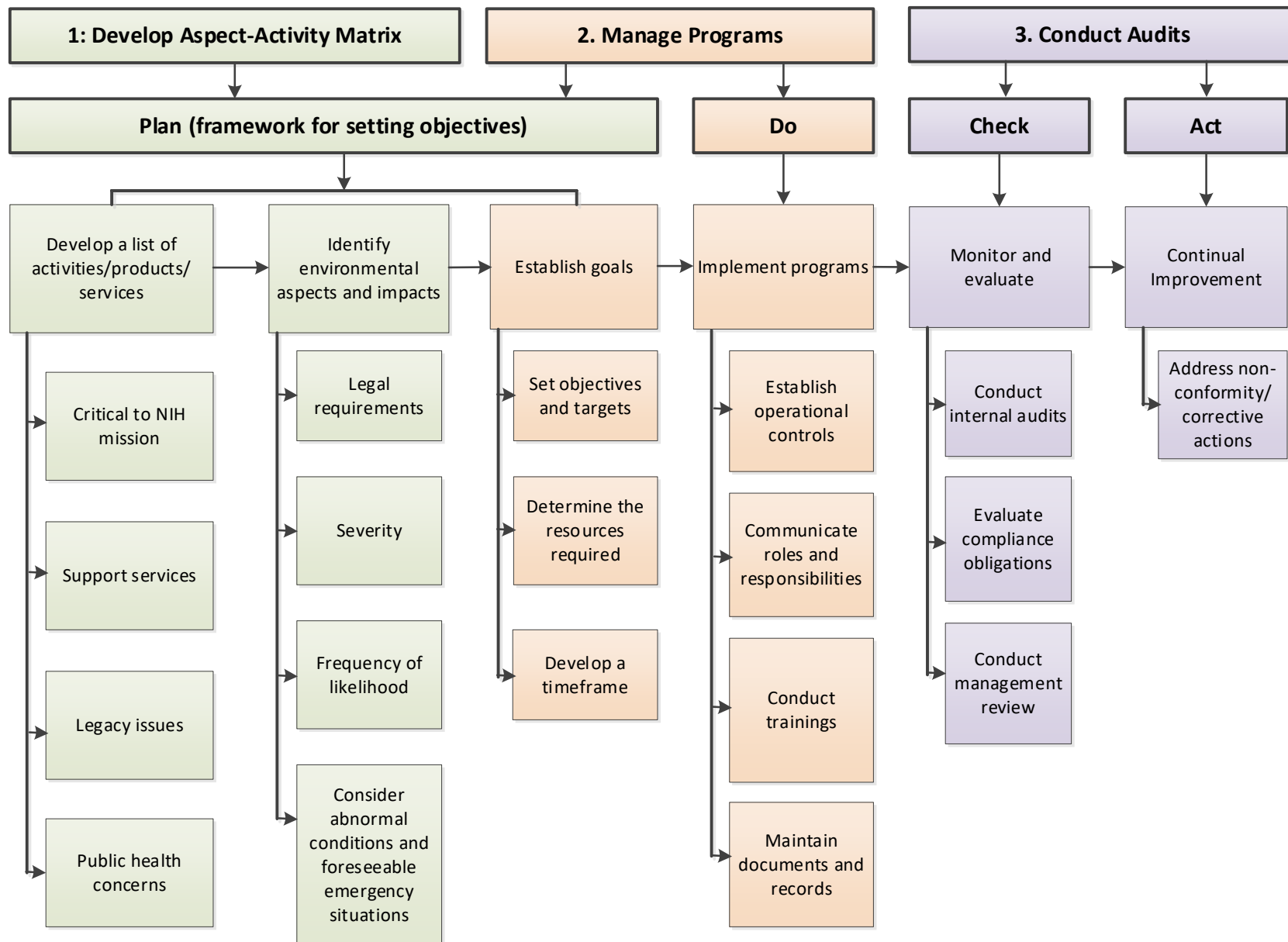
Step 3: Conduct Audits

- Ensure that the environmental program is being implemented effectively and efficiently



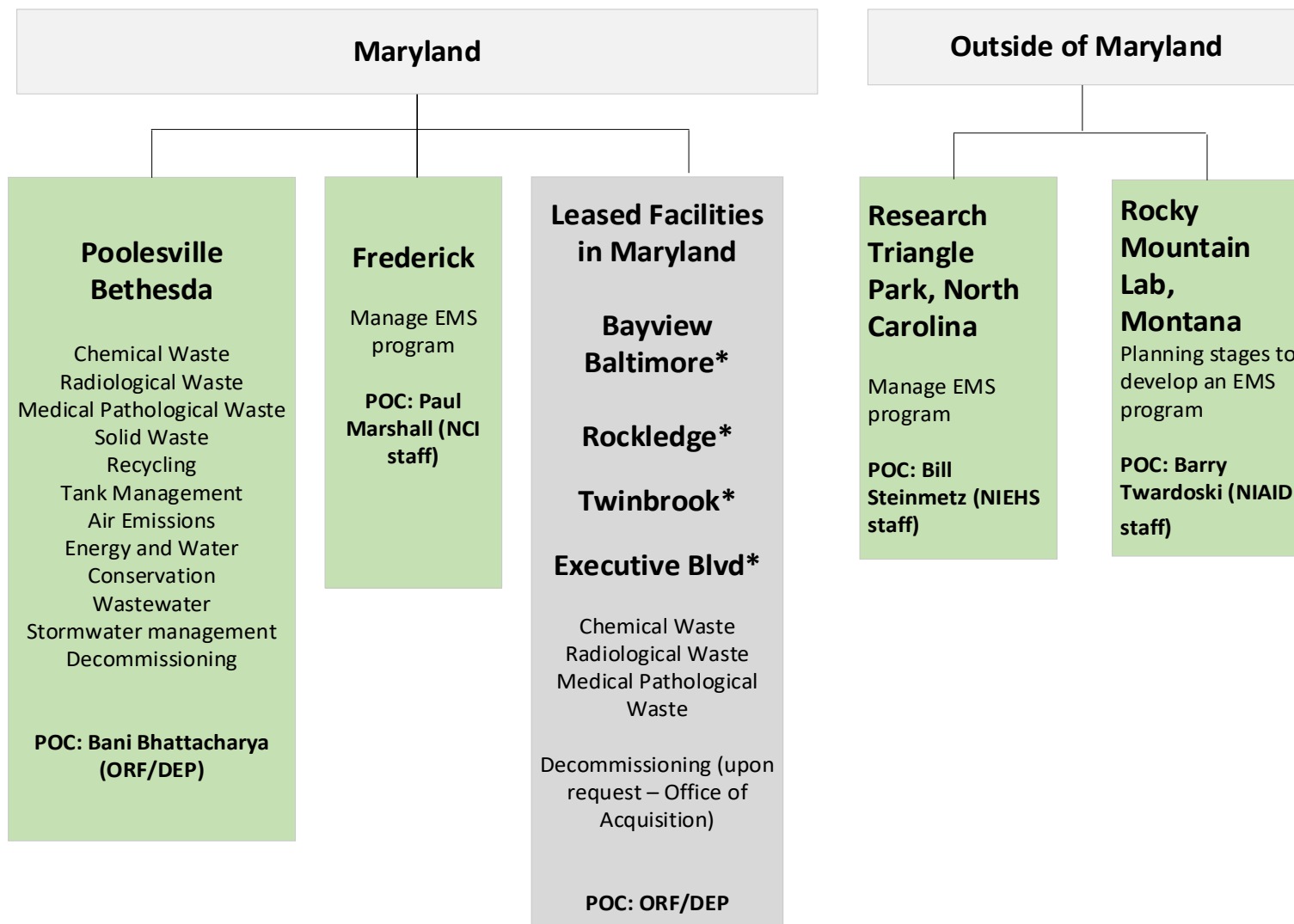


EMS Framework





Delegate Roles and Responsibilities



* per the contract agreement, the lessor is responsible to meet environmental requirements.

■ NIH owned facilities

■ NIH leased facilities



Manage the Internal Audit Program

- NIH (ORF/DEP) consultants for internal environmental audits of each NIH location along with the DEP Regional Manager
- Contractors audit each NIH location once in 2 years for:
 - Environmental compliance
 - Environmental Management System conformance, as applicable
 - Check corrective actions
- DEP Regional Manager
 - assists other locations to address corrective actions
 - reports and updates the NIH senior leadership



*Implementing EMS
at the
National Institute of Environmental Health Sciences
Research Triangle Park
North Carolina*

Bill Steinmetz
EMS Lead

NIEHS: Environmental Management Programs



*National Institute of Environmental
Health Sciences*

- Air Quality
- Energy Management
- Green Purchasing
- Hazardous Materials
- Hazardous Waste
- Pesticides
- Solid Waste
- Stormwater
- Wastewater
- Water Consumption

Example: Solid Waste Management Program

Step 1: Develop Activities and Aspects

Facility Activities

Environmental Aspects

- Biomedical research → Plastic lab waste
- Facility renovation → C & D waste
- Administrative activities → Paper waste
- Solid waste recycling → Cafeteria waste



Step 1: Determining Environmental Significance

$$\text{Environmental Significance} = \text{Frequency} \times [(\text{Severity} \times \text{Scope}) + \text{Probability} + \text{Legal Risk} + \text{Resource Consumption}]$$

- Frequency – How often does the activity occur?
- Severity – What are the potential environmental impacts?
- Scope – Are potential impacts onsite or is there offsite migration?
- Probability – What is the likelihood of an adverse environmental impact?
- Legal Risk – Will we violate any regulations or permit conditions?
- Resource Consumption – Does the activity use recycled materials, renewable resources, or involve recycling of waste?



Step 2 – Manage Programs

Example: EMP Template Form – Solid Waste Management



| ENVIRONMENTAL MANAGEMENT PROGRAM | | | | | |
|---|----------|----------------------------------|------------|-----------------------|----------|
| 1. PROGRAM NAME: | | | | | |
| 2. Significant Environmental Aspect(s): | | 3. Document Control Code: | | | |
| | | 4. Date: | | | |
| | | 5. Program Lead: | | | |
| 6. Goals and Objectives | | | | | |
| Annual Objective(s) | | Performance Indicator(s) | | Resource requirements | |
| | | | | | |
| 7. Reason(s) for Significance: | | | | | |
| 8. Potential Environmental Impacts: | | | | | |
| 9. Legal and Other Requirements (Specify): | | | | | |
| 10. Program Description: | | | | | |
| 11. Operational Controls | | | | | |
| Activity / Aspects | Controls | Responsible Party / Job Function | Monitoring | Records | Comments |
| | | | | | |
| 12. Action Plan: Structure, Authorities, Responsibilities | | | | | |
| Targets/Milestones to meet Annual Objective(s) | | | Timeframe | Responsibility | |
| | | | | | |
| 13. Relevant Document(s) | | | | | |
| Document Name | | Location | | Document Custodian | |
| | | | | | |
| 14. Competence of persons responsible | | | | | |
| Title | | Basis for Competence | | | |
| | | | | | |
| 15. Environmental Management Program Review & Authorization | | | | | |
| EMS Coordinator Review: | | | | | |
| Management Review Authorization: | | | | | |

Plan

Do



EMP Template – Solid Waste Management (cont.)

| 11. Operational Controls | | | | | |
|---|---|---|---|--|--|
| Activity / Aspect | Controls | Responsible Party / Job Function | Monitoring | Records | Comments |
| Laboratory research generating solid waste (Laboratory) | Recycling Guide and recycle bin labeling NIEHS Waste Manual | NIH/ORF Building Management Specialist HSB Environmental Program Manager | Periodic lab Inspections | Contractor provides weight of collected waste | |
| Administration activities generating solid waste (Office) | Recycling Guide and recycle bin labeling NIEHS Waste Manual | NIH/ORF Building Management Specialist HSB Environmental Program Manager | Periodic inspection of collection bins | Contractor provides weight of collected waste | |
| Construction projects generating solid waste (C & D) | Signage posted near C & D dumpster Construction Contract(s) | NIH/ORF Building Management Specialist NIH/ORF Project Officer | Periodic inspection of collection bins Construction site inspections | Contractor provides weight of collected waste | |
| Recycling of solid wastes | Recycling Contract Specifications | NIH/ORF Building Management Specialist HSB Hazardous Waste Specialist | Period inspection of collection bins Green Disk program records | Contractor provides recycling data spreadsheet | Uncontaminated animal bedding is composted offsite and a percentage of the compost is reused onsite for grounds maintenance. |
| Incineration of solid waste | State Air Quality Permit MOU for joint Use of the Incineration Plant | NIH/ORF Project Officer for the CUP contract | Monitoring of incinerator operating parameters | Various logbooks and spreadsheets | |
| Landfill of solid waste | Landfill Hauler Contract Agreement South Wake Landfill requirements | NIH/ORF Building Management Specialist | Visual inspection of the large roll-off containers | Weight records and trip tickets | |



Step 3: Benefits of Auditing

- Local approach: NIEHS has ISO-14001 certified internal auditor team that performs annual EMS audits
- Corporate approach: the NIH conducts third party EMS and environmental compliance audits of NIEHS Campus every two years
- Audit Benefits
 - Evaluates conformance with ISO-14001, verifies that EMS documentation is current, and procedures are being followed,
 - Enhances preparation for environmental compliance inspections by state and local regulatory authorities
 - Experienced third party auditors bring understanding of the regulatory and best practice frontier of knowledge
 - Documented findings can refocus priorities and motivate improvement



Tools for Outreach and Communication

- Leadership support
 - Institute Director sends all-hands emails about EMS
- Training announcements
 - EMS training announcements sent by Institute training coordinator rather than EMS team
- Online articles via internal blog or newsletter
 - Executive Officer sends email announcing new postings
- Awards and Recognition
 - Stimulates employee participation in identifying opportunities for conserving energy, water and reducing environmental impacts
- Grassroots activities
 - Hands on activities connect employees with the environment

Summary

- Teamwork: Seek partnerships and support of working groups and senior leaders to implement programs.
- Tools: Empower the EMS Leads with tools and information to develop and effectively implement EMS.



- Outreach and Communicate: Educate and inform NIH staff about their roles and responsibilities to manage environmental programs.
- Acknowledge: Award a program or staff or working groups for their outstanding support in promoting environmental stewardship.



Thank you!

Questions?

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