U.S. ENVIRONMENTAL PROTECTION AGENCY (EPA)
OFFICE OF MISSION SUPPORT **REVISED DECEMBER 15, 2023**

EPA FACILITIES MANUAL: VOLUME 4

FACILITIES ENVIRONMENTAL MANUAL

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1. Overview

1.1 EPA Facilities Manual

This *Facilities Environmental Manual* is a volume of the *EPA Facilities Manual*. The *EPA Facilities Manual* is composed of four distinct, yet complementary, volumes for planning, designing and managing EPA facilities.

- Volume 1: The *Space Acquisition and Planning Guidelines* contain information on space planning, space utilization standards and furniture.
- Volume 2: *Architecture and Engineering Guidelines* (referred to hereafter as the A&E Guidelines) provide requirements for the design, construction, renovation and alteration of EPA facilities.
- Volume 3: The *Facilities Safety Manual* establishes facility safety requirements to protect against injury, illness and loss of life.
- Volume 4: The *Facilities Environmental Manual* establishes environmental specifications to be addressed by designers and managers of EPA facilities.

1.2 Purpose

The purpose of this EPA Facilities Environmental Manual is to detail environmental considerations for facilities that are owned, leased, or occupied by the EPA. The considerations or criteria in this EPA Facilities Environmental Manual describe the full scope of the facility features required in EPA-occupied facilities to ensure compliance with applicable environmental regulatory standards to preserve environmental quality. These criteria also promote the successful integration of environmental requirements into facility design processes to prevent pollution and support the EPA's goal of environmental stewardship.

1.3 Scope

The facility environmental considerations described in this EPA Facilities Environmental Manual apply to facilities owned or directly leased by the EPA and may be incorporated at the agency's discretion into the Owner's Project Requirements for new EPA leases through the U.S. General Services Administration (GSA). GSA leases follow the Owner's Project Requirements (also known as the Program of Requirements) and the standard GSA lease language, not this EPA Facilities Manual directly. The construction criteria in this manual reiterate the environmental related criteria in the A&E Guidelines. This manual also addresses environmental considerations for operations and maintenance (O&M) of EPA owned or directly leased facilities.

If conflicts exist between applicable codes and standards and the criteria in this EPA Facilities Environmental Manual, the discrepancy will be brought to the attention of Real Property Services Division (RPSD) and the Safety, Occupational Health and Sustainability Division (SOHSD) for resolution. Where meeting the criteria in this EPA Facilities Environmental Manual at existing facilities does not seem feasible, consult RPSD and SOHSD for advice or a variance. Under special circumstances, a variance may be granted by SOHSD.

1.4 EPA Responsibilities

RPSD, SOHSD and appropriate program office or regional management are jointly responsible for ensuring that EPA facilities provide safe, healthful and environmentally compliant workspaces for EPA personnel. This section describes the responsibilities assigned within the EPA for enforcing the criteria set forth in this EPA Facilities Environmental Manual.

- RPSD, with SOHSD's assistance, will review the criteria set forth in the Owner's Project Requirements for new EPA facilities and modifications to existing facilities, before awarding a design contract.
- At significant design and construction points, RPSD, with SOHSD's assistance, will review, approve and comment on the design plans and construction drawings for new and modified facilities.

- RPSD is responsible for ensuring that the design and construction of EPA facilities comply with the requirements specified in the Owner's Project Requirements (for owned and leased facilities), A&E Guidelines (for owned facilities) and GSA lease (for leases), as well as with the criteria described herein.
- During construction, a representative acceptable to SOHSD shall inspect the critical environmental management features of a new or modified facility (e.g., wastewater systems, stormwater management, underground storage tanks [USTs], aboveground storage tanks [ASTs], hazardous waste storage facilities, hazardous material storage facilities) for compliance with the design and construction specifications. These features shall also be acceptance-tested against the design and construction specifications prior to occupancy.
- RPSD and SOHSD are jointly responsible for reviewing and approving requests for variances to the criteria in this EPA Facilities Environmental Manual. The following criteria apply to requests for variances:
  - Requests for variances to the criteria described in this EPA Facilities Environmental Manual must be submitted in writing to RPSD and SOHSD for review.
  - Documentation of granted variances, including their respective approvals, must be maintained by the facility as long as applicable.
- All newly occupied facilities shall be evaluated for environmental concerns before occupancy. This evaluation shall include a record search and an audit, including an inspection for USTs, ASTs, asbestos, radon, lead and other environmental threats. Refer to the *Guidelines for Acquiring and Transferring EPA Real Property and Complying with the Community Environmental Response Facilitation Act (CERFA)*, EPA100-B-00-002 (December 2000).
- RPSD and SOHSD are jointly responsible for updating this EPA Facilities Environmental Manual, as necessary, to reflect changes in environmental technology and best practices relevant to EPA facilities.

1.5 Standards and References

Appendix A of this EPA Facilities Environmental Manual includes a list of relevant regulations. Citations of regulations, codes, standards, references or guidance within this manual shall be assumed to refer to the most recent edition. Any publication dates specifically stated in this manual reflect the version in use when this manual was published. When using this EPA Facilities Environmental Manual, the user shall verify that the documents referenced are the most recent and have not been superseded.

2. Environmental Management Systems

2.1 Purpose

This chapter provides a summary of the EPA's Environmental Management System (EMS) program, which institutes a risk management approach to managing potential environmental impacts and is focused on the continual improvement of the EPA's environmental performance. An EMS is a set of policies and processes that help EPA locations reduce the environmental impacts of their operations; achieve environmental goals; identify and eliminate waste; and increase operational efficiency in a sustained, methodical way. EMSs provide a framework for integrating existing environmental programs, policies, practices and best practices into day-to-day facility operations.

Leading by example is a main priority for the EPA. EMSs help the agency accomplish its goals in areas such as energy management, water conservation, pollution prevention, chemical management, waste management (e.g., recycling, composting), transportation, sustainable procurement, paper consumption, sustainable design and electronics stewardship.

Why EMS?

A properly implemented EMS helps EPA locations prioritize sustainability efforts; manage environmental affairs in a proactive and streamlined way; reduce the agency's overall carbon footprint; achieve compliance with federal EOs, regulations and standards; and establish resilient processes that enable facilities to adapt to changes in operations and staffing, changes in the environment and changing compliance obligations. EMSs also help EPA locations save money and conserve resources, improve communications, create goodwill in the community, demonstrate leadership, build credibility and make workplaces safer. Moreover, EMSs prioritize employee engagement by establishing processes that train, mobilize and empower all staff members to serve as environmental stewards.

2.2 References

EPA locations are required to satisfy a variety of Executive Orders (EOs) and federal, state and environmental regulations, which pose numerous environmental requirements and sustainability goals for EPA locations to satisfy. (Many of them are mentioned in other chapters in this manual.) EMSs help meet these requirements and goals in a streamlined fashion, a point that four EPA Administrators have made in a series of EMS commitment statements (see sidebar at right). Moreover, since 2000, a series of EOs have encouraged federal agencies to implement a systematic approach to reduce their environmental impacts, with some of them specifically referring to EMS as the means to do this. For example, EO 14057 requires agencies to "develop an agencywide strategic process" to meet aggressive sustainability goals. More specifically, the Implementing Instructions for EO 14057 say:

The History of EMS at the EPA

The EPA's commitment to EMS stretches back to 2002, when Christine Todd Whitman issued an EMS policy that challenged the EPA to be a leader in EMS implementation. Four subsequent EPA Administrators have released EMS Commitment Statements based off that initial policy. Today, the agency remains committed to using EMS as a framework to minimize its environmental footprint and steer it toward continual environmental improvement (see the EPA's November 2022 EMS commitment statement).

> Agencies should continue to use effective management strategies, such as environmental management systems (EMS) and energy management systems (EnMS), if they align with and support their agency needs and facilitate implementation and progress toward E.O. goals.

Table 2-1 provides a summary of the key drivers for the EPA's agencywide EMS program.

Table 2-1: References for EMS

Topic	References
Executive Orders and statutes	• EO 14057, *Catalyzing Clean Energy Industries and Jobs Through Federal Sustainability* (December 2021) and its associated Implementing Instructions (released in August 2022) • Energy Act of 2020 • Other EOs and a variety of statutes that outline federal sustainability goals, including but not limited to, the following: – EO 14008, *Tackling the Climate Crisis at Home and Abroad* – EO 14037, *Strengthening American Leadership in Clean Cars and Trucks* – Resource Conservation and Recovery Act, Section 6002 – Energy Policy Act of 2005 – Energy Independence and Security Act of 2007 *Note: EOs and statutes do not mandate agencies to use EMS, but the EPA has determined that EMS is required to help the agency meet the goals and requirements that they pose.*
EPA Policy and Guidelines	• EPA's Commitment to Environmental Management Systems (signed by EPA Administrator Michael Regan on November 2, 2022) • EPA Safety, Health and Environmental Management Program (SHEMP) Guideline 2, *Environmental Management Systems*
Agencywide Implementation Plans	Agency roadmaps, such as ConservE, ConservW and the Agencywide EMS Objectives, Targets and Metrics, include goals for EPA locations to pursue through their EMSs

2.3 Framework

The International Organization for Standardization (ISO) developed the ISO 14001 standard to provide a set of internationally recognized requirements for environmental management. The latest version was published in 2015. The EPA has instructed its locations to implement EMSs that conform with the standard. ISO 14001 outlines a risk-based and proactive approach that helps reduce the risk of non-compliance and improves environmental practices. As shown in Figure 2-1 (see next page), the main elements of ISO 14001 can be incorporated into a repeating Plan-Do-Check-Act (PDCA) that fosters continual improvement. During the **PLAN** phase, organizations develop environmental policies, establish environmental objectives, and develop plans for achieving those objectives and improving environmental performance. To do this effectively, they must:

- Carefully assess the context of their organizations, which involves identifying interested parties, exploring internal and external issues, and defining the scope of the EMS.
- Consider relevant compliance obligations.
- Examine the different ways their activities could impact the environment.
- Identify key players who will implement environmental plans and initiatives and ensure that their roles and responsibilities are clearly communicated to them.

The next part of the cycle is the **DO** phase, where organizations implement operational controls and environmental management programs. To ensure success, they also complete several support steps, such as securing adequate resources for EMS, building competency and awareness among key staff members who are responsible for their location's environmental performance, establishing solid communication systems, documenting relevant information, and addressing emergency preparedness and response.

After that, organizations move into the **CHECK** phase. During this phase, organizations monitor and measure a variety of parameters to assess whether they are meeting their commitments and environmental objectives. Organizations also perform internal EMS audits and management reviews to look for EMS nonconformances and opportunities for improvement. The results from these reviews inform the next phase of the cycle — the **ACT** phase — where nonconformances are mitigated and corrective actions are taken if it becomes apparent that

modifications or new approaches are needed to achieve environmental objectives. Output from this phase feeds back into the PLAN phase and the cycle repeats, propelling continual improvement.

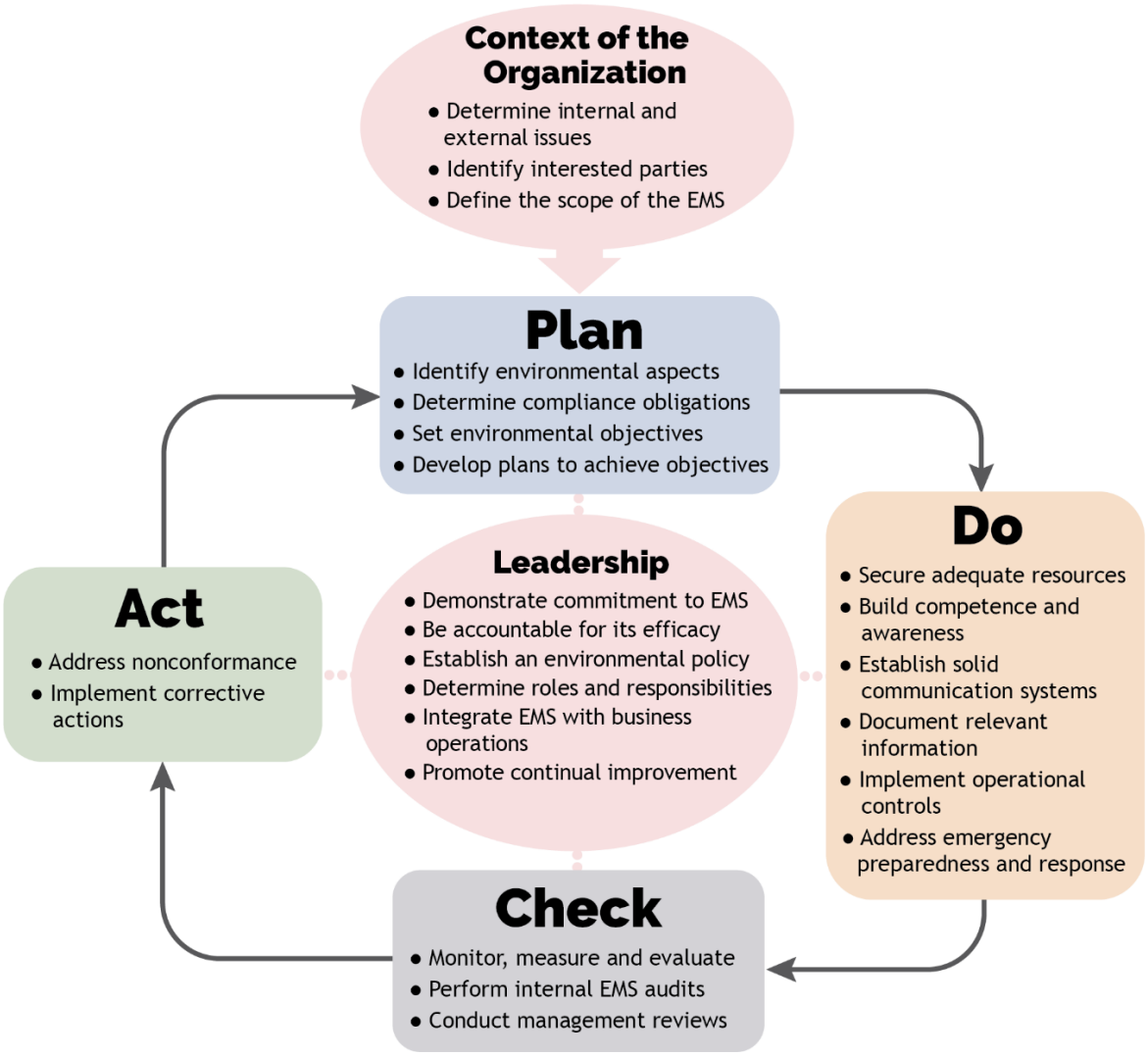

Figure 2-1: ISO-14001 Elements Integrated into the PDCA Model

The EMS continually moves through this PDCA cycle, allowing organizations to fine-tune the way they manage operations that harm the environment. This "continual improvement cycle" is a fundamental characteristic of the EMS; it allows the system to adapt to the dynamic nature of the organization's operations and to remain relevant and viable for its intended purposes.

Leadership lies at the center of a successful EMS. ISO 14001 makes this point clearly, emphasizing that top management (senior managers) must demonstrate commitment to EMS, accept accountability for its performance, and ensure that EMSs have adequate support and direction. Senior managers are expected to champion EMS and set the organization on a productive path to achieve sustainable environmental outcomes. They do this by leading by example, generating enthusiasm, and ensuring that the EMS is integrated into business processes and aligned with the organization's strategic direction. Top management has an important role to play in the environmental policy, objectives, resources and overall effectiveness of the EMS.

2.4 Development, Implementation and Training

EMSs are established at all of the EPA's major facilities, including headquarters, the EPA's 10 regions (main offices, operations and field offices and laboratories), six Office of Research and Development locations, three Office of Air and Radiation locations, the Office of Enforcement and Compliance Assurance's National Enforcement Investigations Center, Research Triangle Park and the agency's Cincinnati location. As noted previously, the EPA expects its locations implement EMSs that conform to ISO 14001. The EPA does not, however, require third-party certification from an accredited external certification body. Instead, the EPA's SOHSD sends auditors to each of its EMS locations triennially to perform EMS conformance audits. The auditors assess specific EMS elements and determine which ones are conforming, partially conforming or nonconforming. SOHSD uses the results to calculate an EMS performance score for the location, where green is the highest score, yellow is the middle score and red is the lowest. In the years between triennial audits, SOHSD collects information about each EPA location's EMS via questionnaire and then applies criteria developed by an Interagency EMS Community of Practice Workgroup to assign a red, yellow or green score. At least 80 percent of the EPA's individual locations must score green for the agency as a whole to achieve a green EMS score.

Sustaining continual improvement is challenging; it requires frequent "cheerleading" from managers, inspirational and motivational messaging and effective training. Regarding the latter, it is essential to provide the following:

- **EMS Awareness Training:** The success of the agency's environmental performance hinges on employee involvement, which is why it is important to deliver EMS awareness to all staff. The EPA offers online *EMS-Employee Awareness* through FedTalent to assist with this effort.
- **EMS Implementation Courses:** The EPA has also developed training to help EMS teams implement effective EMSs that conform with ISO 14001 requirements. That training is posted on SOHSD's Intranet. Also, SOHSD periodically hires external training companies to provide ISO 14001 Foundation and Lead Auditor courses and invites EMS team members to participate in them.
- **Environmental Compliance and Stewardship Training:** In addition to the EMS team, many other EPA staff members are directly involved in implementing operational controls and environmental management programs. For example, the EMS team relies on fleet managers to reduce petroleum use, facility managers to shut off unneeded lights, acquisitions staff to purchase environmentally friendly products and custodial staff to select green cleaning agents. All of these groups require training to ensure that they understand the goals they should be pursuing and that they have a firm grasp on all related compliance obligations.

2.5 Personnel Responsibilities

Implementing a successful EMS requires involvement throughout all levels. The following provides an overview of expectations for key groups:

- **Top Management:** Senior leadership commitment, advocacy, and involvement are critical in supporting an ongoing ethic of compliance assurance and environmental stewardship across the agency's diverse mission activities, programs and operations. Clause 5 of ISO 14001 identifies requirements for senior managers, which are summarized in the box at right. ISO 14001 defines top management as "a person or group of people who directs and controls an organization at the highest level." At the EPA, positions that fall into that category include:
  - **Assistant Administrators, Deputy Assistant Administrators, Regional Administrators and Deputy Regional Administrators:** Promote implementation and adherence to environmental performance objectives and targets in their offices and associated Program and Regional Offices by providing top management support, promoting advocacy through established management forums (e.g., senior staff meetings, Innovation Action Council) and monitoring performance.
  - **Mission Support Division Directors and Laboratory Services and Applied Science Division Directors:** Support agencywide EMS objectives and targets by providing management commitment and strategic direction, allocating resources, ensuring delegation of authorities and responsibilities for implementation, and monitoring Program Office and National Laboratory performance.
  - **Program Directors and Division Directors:** Support agencywide EMS objectives and targets by providing operational direction consistent with unit-level business and performance plans, allocating resources, ensuring delegation of authorities and responsibilities for implementation, and monitoring program and division-level performance, including corrective actions.
  - **Laboratory Branch Chiefs and Laboratory Directors:** Designate assignments for tactical execution of agencywide EMS objectives and targets, allocate facility-level resources, and routinely evaluate performance against established objectives and targets through established EMS management review forums.
- **EMS Coordinators and SHEMP Managers:** Each EPA location has an EMS coordinator and a SHEMP manager, and in some cases, the same person fills both roles. These individuals assist in the detailed execution of initiatives associated with agencywide EMS objectives and targets. They stay abreast of options and strategies that exist to reduce the agency's environmental footprint, such as viable options

Requirements for Top Management

ISO 14001 says that top management must do the following to demonstrate leadership and commitment to the EMS:

- Be accountable for the EMS's effectiveness.
- Ensure the development of an environmental policy and objectives that are compatible with the strategic direction and context of the organization.
- Ensure that the EMS is integrated into core business practices.
- Ensure that the resources (e.g., funding, dedicated personnel) needed to achieve EMS success are available.
- Communicate the importance of conforming to the EMS and practicing effective environmental management.
- Ensure that the EMS meets its intended outcomes (e.g., enhanced environmental performance, compliance, achievement of objectives).
- Provide guidance and support to those who contribute to the EMS's effectiveness.
- Promote continual improvement.
- Support other managers demonstrating leadership in their areas of responsibility.
- Participate in management reviews at planned intervals at least once per year.

for waste reduction and prevention strategies and resource conservation opportunities, and they work with management and other EPA work groups to implement effective best practices. The EMS coordinators in particular are instrumental in reviewing and integrating the substantive and administrative provisions of the agencywide EMS objectives and targets into the existing structure and processes established under local facility EMSs.

- **Other Key Managers and Personnel:** To be successful, the following personnel should be included as EMS team members, as they will play a key role in the implementation, monitoring, and reporting of the agencywide EMS objectives and targets.
  - **Facility Managers:** These individuals are responsible for a variety of operational activities within EPA buildings and often play a pivotal role in making decisions that impact resource use. They collaborate with EMS coordinators to collect data on facility performance and to implement best practices that reduce resource use.
  - **Fleet Managers:** These individuals are responsible for collecting information related to the agency's vehicle fleet performance against applicable statutory and EO requirements for transportation.
  - **Energy Managers:** These individuals are responsible for collecting information related to the agency's energy performance against applicable statutory and EO requirements for energy management.
  - **Acquisition Professionals:** These individuals oversee the EPA's purchases. They are responsible for promoting the procurement of products and services that satisfy sustainable purchasing requirements.

The positions mentioned above are critically important to an EMS's success. Ideally, however, every employee at the EPA should play an active role in improving the agency's environmental performance. They should be encouraged to embrace EMS and to actively seek, propose and implement new opportunities for reducing their environmental impacts at work.

2.6 Reporting and Recordkeeping

SOHSD instructs EPA locations to submit a wide variety of environmental performance data each year so that it can monitor how the agency is doing in meeting its Agencywide EMS Objectives, Targets and Metrics (referred to as "the OTMs"). The OTMs translate sustainability requirements (derived from applicable laws and EOs) into goals and targets for the EPA to pursue through its EMSs. The OTMs present targets that cover greenhouse gas (GHG) emissions; energy and water use and management; vehicle use and transportation; sustainable buildings; waste and chemical management and pollution prevention; sustainable acquisition; electronics stewardship; and other environmental stewardship, environmental justice, community engagement and climate resiliency initiatives. The EPA uses numerous data tracking systems to track progress in these areas, including:

- ConservE
- ConservW
- GreenCheck
- FleetCommander
- Blanket Purchase Agreements
- Comprehensive GHG inventory
- Chemical management inventories
- Emergency Planning and Community Right-to-Know Act (EPCRA) reporting
- SOHSD's annual environmental stewardship questionnaire

The EPA uses the data collected to generate a variety of internal reports, including:

- **EPA's Annual Environmental Stewardship Report:** The report presents information about environmental performance at the agencywide level for a variety of areas, including efforts to implement EMSs, achieve environmental compliance, replace equipment that contains harmful materials (e.g., mercury, ozone-depleting substances [ODS], polychlorinated biphenyls [PCBs]), minimize waste generation, divert waste from landfills, support green custodial practices, reduce the use of toxic chemicals, foster responsible chemical management practices, promote energy and water conservation, reduce transportation-related impacts, promote the purchase of green products and services, encourage electronics stewardship and support other responsible environmental practices. The report also includes a section that specifically evaluates and scores the agency's EMS performance.
- **Environmental Stewardship Mini Reports:** SOHSD creates environmental stewardship mini reports for each of the EPA's major locations annually. The reports use color-coded scores to show how EPA locations performed across a range of environmental parameters compared to the EPA as a whole. SOHSD sends the reports to EMS coordinators, SHEMP managers and senior managers to pinpoint areas needing improvement.
- **Quarterly Energy and Water Use Reports:** SOHSD develops quarterly reports to track energy and water intensity reduction progress at each of its laboratories where the EPA is directly responsible for utility payments. The reports display progress toward ConservE and ConservW targets.
- **GHG Emissions Reports:** SOHSD prepares an annual GHG emissions inventory report that summarizes the agency's GHG emissions reductions since fiscal year 2008. The report displays progress by GHG emissions scope and is shared with EPA facility managers.
- **Facility and Fleet One-Pagers:** SOHSD develops annual reporting facility and regional fleet one-pagers to summarize key characteristics and progress metrics toward statutory and EO sustainability targets. The facility one-pagers present information on the facility's use of carbon pollution-free electricity, climate resiliency topics, high-priority projects, annual energy and water consumption, net-zero emissions projects, and the number and type of meters that are present. The fleet one-pagers include the year-over-year change in electric vehicle miles traveled, FleetCORE-Z assessment date, projected zero-emissions vehicle acquisitions, breakdown of vehicles by type and fuel type, and strategies for improving performance. The one-pagers are shared with facility and fleet managers and their supervisors.

The EPA is also required to produce external reports that provide updates on the agency's progress in meeting several environmental and sustainability goals that it is pursuing through EMS. For example, the agency submits:

- **Strategic Sustainability Plans:** The EPA develops and submits plans to the Council on Environmental Quality (CEQ) each year to provide information about its efforts to achieve EO 14057 goals related to net-zero emissions buildings, carbon pollution-free electricity and zero-emission vehicles.
- **EPA's Annual Energy Management Data Report:** The EPA submits this report, which calculates the agency's annual GHG emissions, annual energy and water intensity, metering implementation, use of performance contracting to fund energy conservation measures, and energy management training to the U.S. Department of Energy (DOE) each year to satisfy reporting requirements under the Energy Independence and Security Act and the Energy Act of 2020.
- **Alternative Fuel Vehicle Acquisition Report:** The EPA uses the Federal Automotive Statistical Tool (FAST) to report how many alternative fuel vehicles and low-emitting vehicles it purchases annually and how much alternative fuel the agency uses in dual-fuel vehicles. The EPA posts the report summarizing its alternative fuel vehicle acquisition compliance to its public-facing Greening EPA website.
- **FAST Vehicle-Level Data Report:** The EPA annually submits a report in FAST that captures miles traveled, cost by category, and fuel type and quantity consumed for each owned and leased vehicle in the EPA's fleet.

- **Office of Management and Budget (OMB) A-11 Fleet Budget Summary and Fleet Management Plan:** In the OMB A-11 budget submission, the EPA projects vehicle acquisitions, disposals and operating costs for the current and next two fiscal years. The Fleet Management Plan – the narrative that accompanies the OMB A-11 budget submissions – offers a multi-year map that describes the EPA's systemic approach to vehicle acquisition, use, maintenance, refueling and replacement. The Fleet Management Plan also details how the agency will comply with all current management and sustainability mandates. The EPA submits both annually to FAST.
- **Vehicle Allocation Methodology (VAM):** The Federal Management Regulation 102-34.50 requires agencies to complete a VAM, which is a process used by federal fleet managers to identify their optimal fleet inventory. Agencies are required to complete a VAM at least once every five years. The VAM results inform the EPA's Optimal Fleet Profile, which is uploaded to FAST.
- **Electric Vehicle Supply Equipment (EVSE) Tracker:** The EPA updates and submits this tracker quarterly to CEQ. The tracker supports the planning, installation and design of EVSE by compiling a comprehensive dataset of all sites where the agency plans to install EVSE to support federal fleet vehicle charging.
- **Federal Climate Adaptation Plan:** The EPA develops its Climate Adaptation Plan as requested by CEQ. The Climate Adaptation Plan identifies potential impacts from climate change to the EPA's mission and operations and describes a strategic implementation plan to adapt and build resilience to those impacts.
- **GSA Federal Real Property Profile:** SOHSD contributes to the EPA's annual Federal Real Property Profile reporting to GSA by providing the utility costs of EPA-owned buildings and updating the agency's inventory of buildings that qualify as sustainable buildings.

Each year, OMB pulls data that the EPA submits to other agencies (via some of the reports listed above) to create the **OMB Federal Sustainability Scorecards** (available at https://www.sustainability.gov/epa.html). OMB compiles the scorecard and sends it to the EPA for review.

3. Air Pollution Control

3.1 Purpose

This chapter establishes the standards applicable to activities at EPA facilities that may affect air quality. These activities include construction, modification, or reconstruction of air emission sources; control of criteria and hazardous air pollutants (HAPs); O&M of systems containing ODS or substitute refrigerants; and management of products containing volatile organic compounds (VOCs).

3.2 References

EPA facilities shall be designed and operated to comply with applicable air emission limit permitting requirements as specified by the Clean Air Act (CAA) regulations in the Code of Federal Regulations (CFR) Title 40 Parts 60, 61, 63 and 82, as well as state and local requirements, and as specified in the A&E Guidelines. Table 3-1 includes a list of references that provide guidance for compliance with the requirements described in this chapter.

Table 3-1: References for Air Pollution Control

Topic	References
Nonattainment Areas for Criteria Pollutants	EPA Green Book, https://www.epa.gov/green-book
Clean Air Technology Center	EPA Clean Air Technology Center, clearinghouse for approved control technologies, https://www.epa.gov/catc/ractbactlaer-clearinghouse-rblc-basic-information
Hazardous Air Pollutants	List of HAPs, https://www.epa.gov/haps/initial-list-hazardous-air-pollutants-modifications
Refrigerant Management	American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) Standard 15, *Safety Standard for Refrigeration Systems*
	List of refrigerant alternatives approved under the Significant New Alternatives Policy (SNAP), https://www.epa.gov/snap/substitutes-refrigeration-and-air-conditioning

3.3 Air Emissions Inventories

In accordance with prevailing federal, state and local requirements, potential sources of air pollution emissions at EPA facilities shall be identified in a documented inventory as an integral part of facility construction, modification, or reconstruction planning. An inventory of the emissions sources shall be established prior to facility and equipment construction, modification, or reconstruction, and shall consider the following point source emissions, at a minimum:

- ASTs and gasoline-dispensing operations
- Cooling towers
- Fossil-fuel fired boilers used to produce hot water or steam for heating purposes
- Internal combustion engines (e.g., emergency power generators)
- Laboratory fume hoods
- Miscellaneous air research and other equipment (e.g., stationary diesel engines, paint spray booths)
- Paint/mechanical shop exhausts
- Research combustors and associated air pollution control devices
- Solid/biological waste incinerators

The air emissions source inventory shall include a list of point sources such as those described above, as well as information on types of fuels (for combustion equipment) and anticipated types of pollutants, as information is

available. In addition, inventories maintained by existing facilities must be updated to reflect the installation of new air emissions sources.

Prior to construction, modification, or reconstruction of any sources identified in the inventory, the maximum operating design capacity (e.g., British thermal units [Btu]/hour heat input capacity, horsepower rating), fuel type and estimated annual fuel consumption shall be determined. Once this information has been determined, federal, state, and local air pollution control regulations shall be consulted to determine which preconstruction and operational permitting obligations must be fulfilled as a part of formal equipment commissioning. Refer to Appendix B of this EPA Facilities Environmental Manual for a list of state environmental agency contacts, including air pollution control organizations.

3.4 New Source Performance Standards

The following emissions sources shall be designed and equipped during construction, modification, or reconstruction in accordance with new source performance standards (NSPS) and other applicable technology considerations:

- Fossil-fuel-fired steam generators (boilers) with a maximum design heat capacity greater than 100 million Btu (MMBtu) per hour (29 megawatts [MW]) shall meet the emission standards to control particulate matter (PM), sulfur dioxide (SO_2) and nitrogen oxides (NO_x) in accordance with 40 CFR Part 60, Subpart Db.
- Fossil-fuel-fired steam generators (boilers) with a maximum design heat capacity of 10 MMBtu to 100 MMBtu per hour (29 MW) shall meet the emission standards to control PM, SO_2 and NO_x in accordance with 40 CFR Part 60, Subpart Dc.
- Volatile organic liquid (including petroleum liquid) storage vessels with a volume of 75 cubic meters (approximately 19,800 gallons) or greater shall meet the emission standards for VOCs in accordance with 40 CFR Part 60, Subpart Kb.
- Sources of VOCs (e.g., laboratory fume hoods, painting operations, ASTs) and NO_X (e.g., boilers) located in ozone nonattainment areas may qualify as "major sources" based on their emissions levels and the attainment classification of their air quality control region. Current nonattainment areas can be found on the EPA Green Book (https://www.epa.gov/green-book).
- Major sources of VOCs and NO_x are classified by their potential to emit these ozone forming compounds. "Potential to emit" is defined as the maximum capacity of a stationary source to emit a pollutant under its physical or operational design. Table 3-2 identifies the threshold limits for emissions and the corresponding nonattainment area classifications for VOCs and NO_x.

Table 3-2: Ozone Nonattainment Area Classifications

Classification	Emission Thresholds for Major Sources (tons per year)
Marginal	100
Moderate	100
Serious	50
Severe	25
Extreme	10

Facilities with sources identified as "major" under the above criteria must be designed to reduce emissions by application of reasonably available control technology (RACT), best available control technology (BACT), or lowest available emission rate (LAER), as specified by state regulations and applicable federal Control Technical Guidelines adopted by state programs. The EPA Clean Air Technology Center (Office of Air Quality Planning and Standards) in

Research Triangle Park, North Carolina, is a clearinghouse for information on approved control technologies for different types of air emissions sources. The clearinghouse can be accessed at https://www.epa.gov/catc/ractbactlaer-clearinghouse-rblc-basic-information.

3.5 Hazardous Air Pollutants

Under the Clean Air Act Amendments of 1990, the EPA regulates emissions of specific HAPs. A list of HAPs can be found at https://www.epa.gov/haps/initial-list-hazardous-air-pollutants-modifications. Major sources of HAP emissions at EPA facilities shall comply with applicable requirements of the National Emission Standards for Hazardous Air Pollutants (NESHAPs). Major sources include facilities with a stationary source, or group of stationary sources, located within a contiguous area and under common control that emit HAPs in quantities that exceed 10 tons per year for any single HAP, or 25 tons per year of any combination of HAPs.

The construction or modification of facilities that have the potential to emit threshold quantities of these HAPs shall be designed in accordance with 40 CFR Parts 61 and 63. More stringent state toxic air pollution control regulations shall also be reviewed for technology considerations impacting facility construction and modification planning. Specific NESHAPs to be considered during construction and modification of EPA facilities include:

- **Asbestos:** Activities involving the demolition or removal of asbestos-containing materials must be performed in accordance with the design and operational specifications of 40 CFR Part 61, Subpart M, and 29 CFR 1926.1101, as well as any more stringent state and local regulations. See also Chapter 7 of this volume for discussion on asbestos operation and maintenance.
- **Boilers:** Boilers firing biomass, oil, or fossil solids at area sources of HAPs must meet the design and operational specifications of 40 CFR Part 63, Subpart JJJJJJ, as well as any more stringent state and local regulations. The area source boiler rule does not cover gas-fired boilers.
- **Reciprocating Internal Combustion Engines (including Emergency Generators):** Emergency generators at area or major sources of HAPs must meet the design and operational specifications of 40 CFR Part 63, Subpart ZZZZ, as well as any more stringent state and local regulations. The requirements will vary depending on the engine size and whether the unit only operates as an emergency generator.
- **Hexavalent Chromium (Cooling Towers):** Facilities shall not be designed or modified to include the use of hexavalent chromium-containing biocides or scale inhibitors in cooling and circulation towers.

3.6 Refrigerant Management and Ozone-Depleting Substances

Any contribution to the depletion of the ozone layer by the use of chlorofluorocarbons (CFCs) at EPA facilities is discouraged. The EPA requires that selection of building materials and systems be consistent with the guidelines of the Protection of Stratospheric Ozone in 40 CFR Part 82. The EPA also discourages the use of hydrofluorocarbons (HFCs), which have a high global warming potential. EPA facilities should be aware of the phasedown schedule for HFCs in 40 CFR Part 84 in order to plan for alternatives. Particular attention shall be paid to the following building elements and systems:

- **Building Materials:** Insulation containing CFCs and other refrigerants harmful to the environment shall be avoided.
- **Halon Fire-Extinguishing Systems:** New halon fire-extinguishing systems shall not be installed in EPA facilities. This policy applies to both fixed systems and portable extinguishers. See Chapter 2 of the EPA Facilities Safety Manual for information on appropriate fire extinguishing systems. Existing EPA facility fire protection systems do not contain Halon.
- **Heating, Ventilation and Air-Conditioning (HVAC) Systems:** Installation of new HVAC systems that contain CFC refrigerants shall be avoided in EPA facilities because of the production phaseout of ODS covered under Title VI of the Clean Air Act, as amended in 1990. New systems must use refrigerants acceptable under SNAP in 40 CFR Part 82, Subpart G. The current list of alternatives approved under SNAP is available at https://www.epa.gov/snap/substitutes-refrigeration-and-air-conditioning. SNAP regulations

prohibit users from replacing CFCs with chemicals that pose an even greater risk to human health and the environment. In addition, new systems should minimize the use of HFCs because of the production phaseout of materials with high global warming potential covered under the 2020 American Innovation and Manufacturing Act.

Each new system must also comply with ASHRAE Standard 15, *Safety Standard for Refrigeration Systems* to ensure that the equipment has the proper safety features. These safety features may include sensitive detectors, alert systems and information on required ventilation systems.

Existing HVAC systems that contain refrigerants shall be maintained in accordance with the practices described below.

- **Retrofitting Existing Systems:** RPSD recommends that existing HVAC systems containing CFCs be replaced, not retrofitted. If, however, retrofitting is the option selected, EPA facilities shall follow the retrofit instructions provided by the refrigerant manufacturer and the HVAC equipment manufacturer.
- **O&M of Existing Equipment:** All persons who maintain, service, or repair appliances, except motor vehicle air conditioners (MVACs), and all persons who dispose of appliances, except for small appliances, room air conditioners and MVACs, must be certified by an approved technician certification program as specified in 40 CFR 82.161. Facilities shall keep servicing records documenting the date and type of service and the quantities of refrigerant added. Facilities also shall keep copies of technician certifications at the facility for three years.

  No person maintaining, repairing, or disposing of appliances may knowingly vent, or otherwise release into the atmosphere, a Class I or II refrigerant or a substitute refrigerant in such equipment unless this venting or releasing is associated with a good faith attempt to recover or recycle the refrigerant (40 CFR 82.154). All persons opening HVAC systems for maintenance, service, or repair, must evacuate the refrigerant to a system receiver or a recovery or recycling machine certified pursuant to 40 CFR 82.158. The required evacuation levels are specified in 40 CFR 82.156. Systems equipped with a non-condensables purge device must not release more than 3 percent of the quantity of refrigerant being recycled through non-condensables purging under the conditions of the Air-Conditioning, Heating, and Refrigeration Institute (AHRI) Standard 740.

  Organizations servicing equipment containing Class I or Class II refrigerants or a substitute refrigerant must use recovery equipment that is certified by the manufacturer to the EPA that the equipment meets the design standards. The manufacturer typically affixes a label or tag to the equipment to communicate that the manufacturer registration occurred. Reclaimed refrigerants for use in EPA facilities must fulfill the purity standards set forth in AHRI Standard 700.

  If commercial and industrial refrigeration equipment with an ODS-containing refrigerant charge of 50 pounds or more is leaking at a rate exceeding 20 percent of the total annual charge, it must be repaired within 30 days. If comfort cooling equipment with an ODS-containing refrigerant charge of 50 pounds or more is leaking at a rate exceeding 10 percent of the total annual charge, it must be repaired within 30 days. If any other type of appliance with an ODS-containing refrigerant charge of 50 pounds or more is leaking at a rate exceeding 15 percent of the total annual charge, it must be repaired within 30 days. After the repair is made, two verification tests must be completed to verify that the repair was made.

  For maintenance and servicing of MVACs, refrigerant recovery and recycling equipment must be used that meets the standards in 40 CFR Part 82, Subpart B, Appendix A.
- **System Decommissioning:** Persons disposing of appliances (except for small appliances, MVACs and MVAC-like appliances) must evacuate refrigerants to the levels specified in 40 CFR 82.156.

  For small appliances, the refrigerant can be recovered on site, or the appliances can be sent to a disposal company. Only disposal or reclaimer companies that have submitted a signed reclaimer

certification statement to the EPA confirming that they recover refrigerant from equipment or appliances before final disposal should be used. The EPA should request a copy of this signed statement before using the disposal services of the company.

3.7 Products Containing Volatile Organic Compounds

Use of low or no VOC containing products is strongly encouraged whenever a substitute, if appropriate, is available at EPA facilities. Some state or local regulations apply to the categorical use of certain VOC-containing products, such as adhesives, sealants, coatings and solvents. Additionally, the VOCs from miscellaneous products not in any of these individual categories may be subject to a facility-wide limitation on usage per hour or per day based on state or local requirements. The VOC data can be obtained from the safety data sheets and categorized to ensure that only compliant materials are being used. In addition, if facility-wide VOC emission limits for these products apply, estimated worst-case VOC consumption rates can be calculated to ensure that the facility meets its compliance obligations.

3.8 Reporting and Recordkeeping

EPA facilities are responsible for evaluating federal, state and local codes and regulations to identify all applicable reporting and recordkeeping requirements. These requirements vary based on factors such as the location, type of facility and equipment installed. Examples of reporting and recordkeeping requirements for air pollution control that may apply to EPA facilities include:

- Actual emissions calculations based on usage hours, throughput, or other measurements
- Air emissions source inventory listing equipment, operations and stored materials
- Air permit applications and approvals, including construction and operation permits
- Certificate of Conformity
- Emissions unit and control technology specifications
- Equipment or system designs
- Fuel delivery records
- Inventory of new and recovered refrigerants
- Inventory of paints, primers, stains, adhesives, sealants, coatings, solvents
- Inventory of refrigerant-containing equipment and ODS
- Potential-to-Emit calculations
- Records of repair and maintenance activities
- Refrigerant leak rate calculations and notifications
- Refrigerant or appliance disposal records
- Refrigerant purchase records
- Safety Data Sheets
- Technician certification records

4. Water Pollution Control

4.1 Purpose

This chapter describes the statutory and regulatory requirements for controlling water pollution as a result of EPA facility activities. These activities include the direct and indirect discharge of wastewater, as well as construction activities contributing to stormwater runoff and wetlands impacts. This chapter also describes the regulatory requirements associated with potable water supplies at EPA facilities.

4.2 References

All wastewater discharges from EPA facilities, including discharges during construction activities, shall comply with Clean Water Act (CWA) and Safe Drinking Water Act (SDWA) requirements, as well as state and local restrictions. Drinking water monitoring shall be conducted as specified in this chapter unless approved by RPSD and SOHSD. Table 4-1 includes a list of references that provide guidance for compliance with the requirements described in this chapter.

Table 4-1: References for Water Pollution Control

Topic	References
Wastewater Discharges	
Direct Discharges	*National Pollutant Discharge Elimination System (NPDES) Permit Writers' Manual*, EPA 833-K-10-001 (September 2010)
Pretreatment	*Industrial User Inspection and Sampling Manual for POTWs*, EPA 831-B-17-001 (January 2017)
Stormwater Management	
Construction	*Construction Stormwater Pollution Prevention Plan Template*, EPA
Drinking Water	
Maximum Contaminant Levels	EPA website: National Primary Drinking Water Regulations
Lead	EPA website: 3Ts for Reducing Lead in Drinking Water

4.3 Direct Wastewater Discharges

As authorized by the CWA, the NPDES permit program controls water pollution by regulating point sources that discharge pollutants into waters of the United States. Potential sources of NPDES-regulated discharges to surface water at EPA facilities shall be identified in a documented inventory of point and non-point discharge sources. NPDES discharge source inventories shall be an integral part of facility construction or modification planning and shall include:

- Process effluent discharges
- Non-contact cooling water discharges

The anticipated operating conditions of discharge sources (e.g., flow rate and concentrations of discharged constituents) shall be evaluated to determine applicable federal and/or state NPDES permit requirements. In most cases, the NPDES permit program is administered by authorized states. Applicable NPDES permitting conditions shall be reflected in design specifications, including representative flow monitoring, sampling, special pretreatment systems and drainage. Special engineering design and control technologies shall be considered and developed in accordance with applicable NPDES permit conditions and effluent guidelines established in 40 CFR Parts 403 to 471.

4.4 Indirect Wastewater Discharges

For facilities discharging effluent to a publicly owned treatment works (POTW), applicable federal (see 40 CFR 403.5(b)) and state (see Appendix B for state water pollution control contacts) pretreatment standards, local sewer use ordinance, permitting and effluent monitoring requirements shall be determined. If applicable, permitting and pretreatment obligations for significant industrial users must be achieved in design and installation. The monitoring and sampling requirements shall be determined for all discharge points and shall include, at a minimum, flow rate, pH measurement and representative influent/effluent sample collection. Additionally, the facility shall have a plumbing design configuration to facilitate mapping of effluent discharge pathways, identification of representative sampling points and future plumbing system modifications.

Elementary neutralization systems shall be provided to neutralize and monitor wastewater discharges for facilities with corrosive effluents to ensure EPA facility conformance with the CWA pretreatment standards for pH in 40 CFR 403.5(b)(2) and pH standards imposed by local POTWs. The system shall include flow-rate measurement, pH sensors, pH adjustment capabilities and engineering features to enable the collection of representative effluent samples. The system engineering controls shall provide the capability to identify and mitigate unacceptable discharges; such controls include pH excursion alarms and automatic flow cutoff devices. System designs shall provide for the routine operation and maintenance of key components such as agitators, pumps, chemical addition systems and pH probes. Guidance on collecting representative wastewater samples to determine effluent quality can be obtained from the EPA publication, *Industrial User Inspection and Sampling Manual for POTWs*.

State and local requirements shall be identified for facilities that will discharge to septic systems or aquifers. Compliance with these provisions will be achieved by incorporating the appropriate design and engineering controls. RPSD shall be contacted for approval of any non-stormwater discharges into septic systems or aquifers.

4.5 Stormwater Management

Stormwater is rain or melted snow that flows over pervious and impervious areas, such as paved streets, parking lots and buildings. When stormwater flows across the ground, it can pick up pollutants that could adversely affect water quality. Specifically, construction activities at EPA facilities that disturb one or more acres of land are required to obtain NPDES construction general permit coverage. The specific construction general permit and application requirements are defined by the NPDES permitting authority (state or federal). These requirements may vary slightly but generally include:

- Submittal of an application for permit coverage, often known as a Notice of Intent, that includes general project information. The EPA's Notice of Intent includes a certification that the activity will not impact endangered or threatened species or has received the required endangered species act approvals.
- Development and implementation of a Stormwater Pollution Prevention Plan (SWPPP), describing appropriate stormwater controls to minimize the discharge of pollutants in stormwater from the site.
- Inspections (e.g., overall site, dewatering operations) by appropriately trained inspectors, along with documentation of inspection findings and corrective actions.
- Submittal of a Notice of Termination when final stabilization of the site has been achieved, as defined in the permit, or when another operator has assumed control of the site.

The primary method of minimizing the discharge of pollutants in construction stormwater is the use of stormwater controls. Refer to *EPA's Construction SWPPP Template* for guidance on developing SWPPPs and for examples of proven stormwater controls.

4.6 Wetlands and Waterways

The CWA regulates the discharge of dredged or fill material into "waters of the United States," which include wetlands. For purposes of the CWA, wetlands is a collective term that includes "those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal

circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions" (40 CFR 120.2(c)(1)). All EPA construction activities that have a potential for significant impact on waters of the United States, including wetlands, shall comply with the CWA requirements described below, as well as any state or local requirements.

Section 404 of the CWA, jointly administered by the U.S. Army Corps of Engineers[1] and the EPA, requires a permit for activities that discharge dredged or fill material into waters of the United States, including activities with significant wetland impact potential. The permit applicant must show that:

- All available alternatives to the impact have been considered, and no practicable alternative exists which would have less adverse impact on the aquatic ecosystem.
- The discharge does not violate other applicable laws, including state water quality standards, toxic effluent standards, the Endangered Species Act and marine sanctuary protections.
- The discharge cannot cause or contribute to significant degradation of wetlands by adversely impacting wildlife, ecosystem integrity, recreation, aesthetics and economic values.
- All appropriate and practicable steps will be taken to minimize adverse impacts of the discharge on wetlands.

Only after avoidance and minimization criteria are satisfied can wetlands mitigation be considered. In establishing mitigation requirements, the applicant must strive to achieve a goal of no overall net loss of wetland values and functions, meaning a minimum of one-for-one functional replacement with an adequate margin of safety to reflect scientific uncertainty. An environmental assessment or environmental impact statement may need to be prepared for each individual permit application (refer to Chapter 10 of this volume for more information).

Section 401 of the CWA, the State Water Quality Certification program, requires that states certify compliance of federal permits or licenses with state water quality requirements and other applicable state laws. Under Section 401, states have authority to review any federal permit or license (such as a 404 permit) that may result in a discharge to wetlands and other waters under state jurisdiction, to ensure that the actions would be consistent with the state's water quality requirements. A Section 404 permit for activities in wetlands cannot be issued by the U.S. Army Corps of Engineers until this state certification has been obtained or waived as provided by federal law.

4.7 Drinking Water

Facility construction planning should include a determination of the source of potable water supplies. Facilities that obtain drinking water from municipal sources have limited responsibilities for monitoring drinking water, except during initial construction or leasing as specified below.

- All newly leased and constructed facilities, and any modifications to the potable water system, shall have the potable water tested (optimally, a sample should be drawn from the main supply line to the facility, as well as at several affected points of use) to ensure conformance with the EPA National Primary Drinking Water Regulations. Applicable maximum contaminant levels can be found at https://www.epa.gov/ground-water-and-drinking-water/national-primary-drinking-water-regulations. Additionally, potable water system testing shall include legionella. It is recommended that this testing be completed every three years.
- In all newly leased and constructed facilities, any modifications to the potable water system, and in instances where the potable water system has not been in regular usage for a significant period of time, all affected drinking water fountains and filtered water sources shall have the filters replaced prior to operation and any testing.

[1] Some states have assumed administration of the Section 404 program and serve as the permitting authority instead of the U.S. Army Corps of Engineers. A list of states that have assumed Section 404 program administration can be found at https://www.epa.gov/cwa404g/us-interactive-map-state-and-tribal-assumption-under-cwa-section-404.

- All newly acquired facilities or newly plumbed systems shall test for lead (action level of 15 micrograms per liter) and copper (action level of 1.3 milligrams per liter) to ensure conformance with action levels in response to major facility modifications, plumbing system alterations, or the addition of new water supply fixtures (e.g., water coolers). Potable water shall be tested for lead content in accordance with the EPA's *3Ts for Reducing Lead in Drinking Water* (https://www.epa.gov/ground-water-and-drinking-water/3ts-reducing-lead-drinking-water). For copper monitoring of potable water, the Office of Water recommends that one 30-second flush sample be taken at an internal tap from which water is typically drawn for consumption.
- All drinking water test results must be within acceptable limits. Any results outside of acceptable limits must be investigated, corrective actions taken and water retested.

Where drinking water is derived from onsite wells and is provided to more than 25 individuals or 15 service connections for at least 60 days out of the year, facilities must comply with the requirements for "public drinking water systems" under the SDWA regulations. These systems are subject to periodic monitoring for physical, chemical, radiological and biological parameters as specified in 40 CFR Parts 141 and 143.

Facilities that obtain drinking water from onsite wells should also be designed with sufficient pretreatment capabilities to ensure the safety and aesthetic quality of the water for general consumption. At a minimum, pretreatment systems for water obtained from onsite sources should provide levels of performance that ensure fulfillment of the primary maximum contaminant levels in 40 CFR Part 141, the lead and copper action levels in 40 CFR 141.80, and the secondary maximum contaminant levels in 40 CFR Part 143.

4.8 Reporting and Recordkeeping

EPA facilities are responsible for evaluating federal, state and local codes and regulations to identify all applicable reporting and recordkeeping requirements. These requirements vary based on factors such as the location, type of facility and equipment installed. Examples of reporting and recordkeeping requirements for water pollution control that may apply to EPA facilities include:

- Construction general permit inspection and corrective action documentation (varies by permit)
- CWA Section 404 permit and associated records
- NPDES discharge source inventory (point and non-point sources)
- NPDES permit and associated records (e.g., design specifications, representative flow monitoring, sampling, special pretreatment systems, drainage)
- Plumbing design drawings to map effluent discharge pathways and identify sampling points
- Potable water test results
- Wastewater discharge monitoring and sampling results (e.g., flow rate, pH, representative influent/effluent samples)

5. Solid Waste Management

5.1 Purpose

This chapter describes the solid waste management requirements, including hazardous and non-hazardous waste, to be addressed by building designers and facility managers. The chapter focuses on the regulations of the Resource Conservation Recovery Act (RCRA) for the various types of hazardous waste handlers: generators; transporters; and treatment, storage and disposal facilities. This chapter also discusses hazardous waste minimization and non-hazardous solid waste management. Details are discussed for integrating design standards for waste management into the facility planning process.

5.2 References

Federal hazardous waste requirements are found in 40 CFR Parts 260 through 279. Parts 262, 264 and 265 are the most relevant to facility design. EO 14057 *Catalyzing Clean Energy Industries and Jobs Through Federal Sustainability* outlines requirements for minimization and diversion of non-hazardous solid waste and construction and demolition waste. Table 5-1 includes a list of references that provide guidance for compliance with the requirements described in this chapter.

Table 5-1: References for Hazardous and Solid Waste

Topic	References
Facility Waste Management	EPA SHEMP Guidelines
Federal Waste Diversion Goals	EO 14057 *Catalyzing Clean Energy Industries and Jobs Through Federal Sustainability*
Hazardous Waste Export	EPA website: Information for Exporters of Resource Conservation and Recovery Act (RCRA) Hazardous Waste

5.3 Hazardous Waste Management

5.3.1 Generator Requirements

Most EPA facilities operate solely as generators of hazardous waste. The specific regulatory standards that EPA facilities must follow are based upon the quantity and type of regulated hazardous waste they generate on a monthly basis and all regulated hazardous waste accumulated on site. Under the federal rules, there are three generator classes:

- **Very Small Quantity Generator (VSQG):** VSQGs generate no more than 100 kilograms (kg) of non-acute hazardous waste, 1 kg of acute hazardous waste, or 100 kg of spill residues per month. Most EPA offices and administrative buildings will qualify as VSQGs. EPA facilities operating under VSQG status are generally not subject to substantive regulation under federal and state hazardous waste laws. VSQGs must deliver their hazardous waste to approved facilities and comply with applicable U.S. Department of Transportation (DOT) requirements when sending these wastes off site.
- **Small Quantity Generator (SQG):** SQGs generate between 100 and 1,000 kg of non-acute hazardous waste and no more than 1 kg of acute hazardous waste per month. Additionally, they can only accumulate wastes on site for up to 180 days (or 270 days when transporting over 200 miles) and can accumulate no more than 6,000 kg of hazardous waste on site at any time.
- **Large Quantity Generator (LQG):** LQGs generate more than 1,000 kg of non-acute hazardous waste, 1 kg of acute hazardous waste, or 100 kg of contaminated waste from an acute spill per month. Additionally, they can accumulate wastes on site without a quantity limit but only for up to 90 days.

EPA facilities managing large amounts of chemicals (e.g., laboratories) may generate enough hazardous waste to qualify as an SQG or LQG. General design requirements for these facilities are summarized below. To ensure full

regulatory compliance with federal requirements, facilities should consult 40 CFR Part 262 and applicable state regulations. Additional requirements are also discussed in the EPA Facilities Safety Manual and the A&E Guidelines.

- **Waste Collection and Accumulation Requirements:** Hazardous waste accumulation areas must generally comply with the requirements specified below, though not all requirements apply to VSQGs and SQGs. Note that state and local requirements may be more stringent and federal exemptions may apply to specific circumstances. In addition, indoor hazardous waste accumulation areas must comply with the requirements outlined in Chapter 4 of the EPA Facilities Safety Manual. Hazardous waste can be stored in the following manner:
  - **Containers:** Hazardous wastes at EPA facilities are most commonly held in containers, such as glass solvent jugs, plastic jerry cans and 55-gallon drums. Containers in central and satellite accumulation areas must be left closed except when adding or removing waste, in good condition, compatible with the waste they contain and properly labeled. Central accumulation areas must also be inspected weekly. Sufficient space must be allowed, or a protective barrier installed, so that incompatible wastes (e.g., oxidizers and ignitables) can be separated by a safe distance or means. Container storage areas should have sufficient capacity to contain at least 10 percent of the volume of containers or the volume of the largest container to be accumulated, whichever is greater. The base of the containment system must be free of cracks and gaps and be sufficiently impervious to contain leaks or spills until the collected material is detected and removed. LQGs with containers holding ignitable or reactive wastes must be located at least 50 feet from the facility's property line (unless a waiver is granted by the authority having jurisdiction over the local fire code).
  - **Tanks:** Tanks and ancillary equipment (tank systems) must be properly installed, labeled and kept in good condition. The installation of hazardous waste tanks shall provide for sufficient area for visual tank inspection. Personnel must inspect tank system integrity and monitoring equipment daily. Tank systems at LQG facilities must have appropriate secondary containment (e.g., double-walls, dikes, berms) in case of tank system failure (40 CFR Part 265, Subpart J).
  - **Other Accumulation Units:** SQGs and LQGs are also permitted to store hazardous wastes on drip pads or within containment buildings and must follow the specific standards for these storage units (40 CFR Part 265, Subparts W and DD).
- **Emergency Preparedness and Response:** Aisle space in hazardous waste accumulation areas shall be sufficient to allow for container inspection and for the unobstructed movement of personnel and emergency equipment. State regulations may indicate exact distances.

  Fire extinguishers and other fire control equipment shall be available at hazardous waste accumulation points. Water must be available in sufficient volume and at sufficient pressure to facilitate fire-fighting operations (for example, sprinklers and hose streams). In addition, other safety equipment such as eyewashes and safety showers shall be provided in accordance with the provisions of Chapter 4 of the EPA Facilities Safety Manual.

  Two-way communications, such as radios or telephones, and alarm systems to initiate emergency response shall be available in locations where hazardous waste is handled. LQGs may determine the most appropriate locations within their facilities to locate equipment in accordance with 40 CFR 262.252).
- **Employee Training:** SQG facilities must provide basic training to their employees that makes them thoroughly familiar with proper waste handling and emergency procedures relevant to their responsibilities. LQGs shall develop a full training program in proper waste management and emergency procedures for their employees and review this training on an annual basis. Training for LQG employees must be documented and those records kept on file.

Hazardous waste managers may follow reduced standards when certain materials are sent for recycling if state and local regulations allow. A facility handling any of these special waste streams under separate guidelines must consider those standards within their facility design plan. Items such as hazardous waste batteries, lamps,

mercury-containing equipment, aerosol cans and pesticides sent for recycling may be managed under universal waste standards (40 CFR Part 273). In addition, used oil destined for recycling should be managed under the used oil management standards (40 CFR Part 279). Facilities storing used oil should also consult the requirements for petroleum storage discussed in Chapter 6 of this volume.

State requirements may also be more stringent than federal regulations. State agencies and implementing regulations shall be consulted to help identify applicable standards and determine whether requirements exceed federal regulations. Appendix B of this volume provides a contact list of state hazardous waste management agencies.

5.3.2 Transporter Requirements

EPA facilities that conduct their own waste transport off site must comply with hazardous waste transporter requirements (40 CFR Part 263). Buildings serving as temporary storage areas for waste materials in transit must be considered in the design for these facilities. State implementing agencies may also have more stringent standards for transfer facilities.

5.3.3 Treatment, Storage and Disposal Facilities

EPA facilities that operate long-term storage units, perform other types of treatment, or dispose of hazardous waste on site must comply with permitted or interim status facility standards (40 CFR Part 264 – Permitted; Part 265 – Interim Status).

All facilities with hazardous waste management permits or seeking permits (i.e., interim status) must comply with general facility standards, preparedness and prevention procedures, contingency plans and emergency procedures, manifest requirements, and recordkeeping guidelines. Additionally, there are specific design requirements based on the type of activity they conduct (e.g., storage, disposal) and the permitted units they operate (e.g., incinerators, landfills). To ensure full regulatory compliance, permitted and interim status hazardous waste managers must consult 40 CFR Part 264 or Part 265 for all applicable federal regulations and consider these guidelines in their facility design. Facilities must also consult state implementing agencies to determine if more stringent state hazardous waste management requirements apply.

To apply for a permit to treat, store, or dispose of hazardous waste, hazardous waste managers must submit applications to their implementing agency following specific regulatory procedures. Permits must be granted to the facility prior to beginning these types of operations (40 CFR Part 270).

A typical process employed in many EPA laboratories is solvent (e.g., methylene chloride) distillation and recovery. Hazardous waste managers should consult their state/local regulator as this can be considered hazardous waste treatment.

The export of hazardous waste is subject to specific exporter requirements described in 40 CFR Part 262, Subpart H. Additional information regarding these requirements, as well as the import and export requirements of other countries associated with the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal, can be found at https://www.epa.gov/hwgenerators/information-exporters-resource-conservation-and-recovery-act-rcra-hazardous-waste.

5.3.4 Minimization

Hazardous waste generator facilities and treatment, storage, and disposal facilities must make efforts to minimize hazardous waste generation and disposal through source reduction and recycling efforts. Generators must certify on hazardous waste manifests that they make efforts or have programs in place to minimize hazardous waste generation at their facility. Treatment, storage, and disposal facilities are required to certify annually that they have waste minimization programs in place and maintain this certification in their operating record.

Hazardous waste managers should design waste minimization programs that set explicit goals for reducing the volume and toxicity of waste streams, that encourage personnel input on ways to meet these goals, and that recognize individual and collective accomplishments in meeting goals. Hazardous waste managers should characterize waste generation amounts and toxicity as well as quantify waste management costs. They should use

this information to identify activities that produce the most wastes and take opportunities to prevent waste generation and toxicity at these points, thereby reducing management costs. Hazardous waste managers should additionally exchange technical information with other facilities to foster their own minimization and recycling programs. Finally, hazardous waste managers should conduct assessments of program effectiveness and implement any recommendations identified in these assessments that will lead to minimization improvements.

5.4 Non-Hazardous Solid Waste Management

EPA facilities generate a variety of non-hazardous waste such as office trash, used packing materials, discarded equipment and other garbage. Facilities must comply with requirements related to the collection and storage of this solid waste as well as regulations regarding its proper disposal (40 CFR Part 243).

- **Storage:** Facility design shall provide for adequate size and number of waste storage areas. These areas must be designed such that the waste stored will not constitute a fire, health, or safety hazard. Non-hazardous solid waste must be stored in ways that prevent a nuisance (e.g., odors) and in ways that do not attract vectors (e.g., animals or insects). Facilities shall also arrange for solid waste collection with sufficient frequency to inhibit the creation of such nuisances or attraction of such vectors.
- **Disposal:** EPA facilities will generally not have their own onsite solid waste disposal units. Facilities must arrange to have their wastes disposed of through municipal or private haulers at municipal solid waste landfills, waste-to-energy facilities, or other approved disposal facilities. Some materials may be prohibited from disposal in municipal landfills, and facility personnel shall determine if there are any wastes they cannot dispose of in their regular trash according to local solid waste regulations. Refer to the A&E Guidelines for construction waste management requirements, including development of a Construction Waste Management Plan and diversion goals.

5.4.1 Waste Reduction

EO 14057, *Catalyzing Clean Energy Industries and Jobs Through Federal Sustainability*, requires federal agencies to reduce waste, advance pollution prevention, and support markets for recycled products by annually diverting from landfill at least 50 percent of non-hazardous solid waste, including food and compostable material, and construction and demolition waste and debris by fiscal year 2025; and 75 percent by fiscal year 2030.

Federal Acquisition Regulation (FAR) Subpart 23.1, *Sustainable Acquisition Policy,* requires federal agencies to develop programs to promote and implement cost-effective waste reduction. Federal agencies need to adhere to acquisition policies and procedures supporting programs for protecting and improving the quality of the environment, and to foster markets for sustainable technologies, materials, products, and services. Agencies shall advance sustainable acquisition by ensuring that 95 percent of new contract actions for the supply of products and the acquisition of services, including construction, require products that are energy and water efficient, bio-based, environmentally preferable, non-ozone depleting or made with recovered materials. FAR Subpart 23.4, *Use of Recovered Materials and Biobased Products*, further requires the procurement of products with the highest percentage of recovered material or biobased content practicable.

5.4.2 Recycling and Composting

The facility shall be designed to support an aggressive non-hazardous solid waste recycling plan during construction and after occupancy. The facility design shall properly locate, and provide for, spaces that facilitate the collection, separation, storage, and transport of all recyclable materials, including, as appropriate, compostable materials (e.g., source separated organic waste). General office space, freight elevator areas, shipping and storage areas, and loading docks shall be designed with this important activity in mind. At a minimum, the facility should be designed to include collection and storage areas for recyclable materials including, but not limited to, mixed paper, corrugated cardboard, glass, plastics, and metals, unless local recycling markets are not sufficient to support recycling of these materials. The facility should also take appropriate measures for the safe collection, storage, and recycling of batteries, mercury-containing lamps, electronic waste, and toner cartridges. Collection and storage of additional recyclable and compostable materials should be considered based on the anticipated facility activities and operations.

5.4.3 Energy Recovery from Solid Waste

In accordance with the EPA sustainable waste management hierarchy for non-recyclable and non-compostable waste materials, EPA facilities shall prioritize disposal at a waste-to-energy facility capable of recovering energy from solid waste. If private hauling services are procured, EPA facilities shall specify that waste should be disposed of at a waste-to-energy facility unless markets are not available locally.

5.5 Reporting and Recordkeeping

EPA facilities are responsible for evaluating federal, state and local codes and regulations to identify all applicable reporting and recordkeeping requirements. These requirements vary based on factors such as the location, type of facility and equipment installed. Examples of reporting and recordkeeping requirements for hazardous and solid waste that may apply to EPA facilities include:

- Completed and signed hazardous waste manifests
- Construction waste management plan
- Hazardous waste accumulation area inspection records
- National Biennial RCRA Hazardous Waste Reports (Biennial Reports)
- RCRA closure notifications (facility, waste accumulation unit)
- RCRA generator status re-notifications
- Solid waste diversion goals and associated records

6. Petroleum Storage

6.1 Purpose

This chapter outlines the requirements for petroleum tank storage at EPA facilities. Specific areas covered by this chapter include UST and AST standards, and spill prevention, control, and countermeasure (SPCC) requirements.

6.2 References

Unless more stringent requirements are specified in this Manual or approved by RPSD and SOHSD, all tank designs and installations shall conform to the applicable requirements of 40 CFR Part 280, 40 CFR Part 112, National Fire Protection Association (NFPA) 30, 29 CFR Part 1910, and state and local requirements. Table 6-1 includes a list of references that provide guidance for compliance with the requirements described in this chapter.

Table 6-1: References for Petroleum Storage

Topic	References
USTs	
Regulations	*Implementation Time Frames for 2015 Underground Storage Tank Requirements*, EPA 510-F-15-001 (September 2015)
	State Program Approvals, 40 CFR Parts 281 and 282
Design and Installation	*Installation of Underground Petroleum Storage Systems*, American Petroleum Institute (API) Recommended Practice (RP) 1615
	Recommended Practices for Installation of Underground Liquid Storage Systems, Petroleum Equipment Institute (PEI) RP 100
	Installation and Testing of Vapor Recovery Systems at Vehicle Fueling Sites, PEI RP 300
	UST System Compatibility with Biofuels, EPA 510-K-20-001 (July 2020)
	Cathodic Protection of Underground Petroleum Storage Tanks and Piping Systems, API RP 1632
	Recommended Practice for Corrosion Protection of Underground Piping Networks Associated with Liquid Storage and Dispensing Systems, Steel Tank Institute R892
Operation	*Operating and Maintaining Underground Storage Tank Systems: Practical Help and Checklists*, EPA 510-K-16-001 (February 2016)
Release Detection	*Release Detection for Underground Storage Tanks and Piping: Straight Talk on Tanks*, EPA 510-K-20-002 (August 2020)
Closure	*Closure of Underground Petroleum Storage Tanks*, API RP 1604
ASTs	
Installation and Certification	*Installation of Aboveground Storage Systems for Motor Vehicle Fueling*, PEI RP 200

6.3 General Requirements

Prior to determining the tank specifications and design, the following requirements shall be assessed and considered.

- **Type of Material:** The type of tank and piping material and the composition of the substance requiring storage shall be assessed. Tank compatibility with the substances to be stored shall be determined. Other characteristics of the material to be assessed may include specific gravity, immiscibility in water and volatility of vapor level detection in soils.

- **Volume and Throughput Requirements:** The amount of product to be stored at any one time and the rate of product usage shall be determined. The maximum length of time the product may be needed and the rate of product usage during emergency situations also shall be determined.
- **Surrounding Conditions:** The surrounding conditions of the tank and associated piping shall be addressed, including maximum and minimum operating and exposure temperatures; soil type and background levels of contamination relative to the product to be stored; groundwater level; proximity to navigable waters, adjacent property and buildings; and location of floodplain, utility lines and service points. If a tank system is to be upgraded, the age, as-built design specifications, current tank conditions, compatibility and contents will need to be determined.
- **Nature of Activity:** Whether the tank under consideration is a replacement tank, an upgrade project, or a new installation is critical to determining the design and performance criteria. For logistical consideration of installation sequence and location, it should be established whether the tank is replacing an existing UST or AST. Also, if a tank is being replaced, the closure method should be assessed because this may impact the location of the replacement tank.

6.4 Underground Storage Tanks

6.4.1 General

The EPA defines a UST as any tank, including associated piping, that has at least 10 percent of its volume underground. Generally, if the tank bottom cannot be seen, it likely meets the UST definition. The federal UST provisions of 40 CFR Part 280 apply to USTs storing petroleum and hazardous substances, with the following exceptions:

- Tanks with a storage capacity of less than 110 gallons
- Tanks storing heating oil used on the premises where it is used
- Tanks on the floor of underground areas such as basements (i.e., visual inspection is feasible)
- Septic tanks and systems for collecting stormwater and wastewater
- Oil-water separators
- Emergency spill and overfill tanks (i.e., normally empty)
- Flow-through process tanks

Additionally, states may establish regulations that prescribe more stringent UST design standards and compliance requirements. See Appendix B for state UST contact information.

Note that for new tanks, ASTs are preferred over USTs and the installation of new USTs should be avoided whenever possible.

6.4.2 Location

USTs shall be located in consideration of existing building foundations. Distance or clearance of USTs from buildings should be in accordance with Section 2-4 of NFPA 30 and manufacturer specifications, including the following:

- For areas subject to traffic, the UST shall be protected with 3 feet of earth or with 18 inches of earth well tamped and 6 inches of reinforced concrete.
- For tanks storing Class I liquids, the distance from any part of the tank to the nearest wall of any basement or pit shall not be less than 1 foot, and the distance to any property line that may be built upon, not less than 3 feet.

- For tanks storing Class II or III liquids, the distance from any part of the tank to the nearest wall of any basement or pit or to the nearest property line shall not be less than 1 foot.

6.4.3 Design Standards

All tanks and piping shall be designed according to 40 CFR Part 280, including referenced national consensus standards (e.g., American Petroleum Institute), 40 CFR Part 112, NFPA 30, 29 CFR Part 1910, and state and local requirements. Specific UST system design requirements include:

- **Corrosion Protection:** All parts of the UST system that are underground and routinely contain petroleum must have corrosion protection. This includes the tank, associated piping and any metal components (e.g., connectors, joints, fittings and pumps). For new UST system installations, tank systems (including piping) must be constructed of a noncorrodible material (e.g., fiberglass-reinforced plastic) or be protected from corrosion. Both new and existing tanks made of corrodible material (e.g., steel) must be provided cathodic protection. Approved cathodic protection shall be designed in accordance with 40 CFR 280.20(a)(2) and 40 CFR 280.20(b)(2). Methods of corrosion protection include:
  - **Sacrificial Anode Systems:** Facilities must test the systems in accordance with nationally recognized practices, such as those developed by the National Association of Corrosion Engineers. Qualified corrosion testers must test the system within six months of installation, at least three years after a previous test and within six months of any repairs to a UST system. Facilities must keep the results of at least the last two tests on file.
  - **Impressed Current Systems:** Facilities must ensure performance by using the same testing standards and schedule as sacrificial anode systems. Facility personnel must also inspect the impressed current rectifier at least every 60 days, keeping records of at least the last three rectifier readings. Personnel must keep the impressed current rectifier operating at all times.
  - **Noncorrodible Exterior:** Metallic tanks may be clad or jacketed in a noncorrodible material such as a fiberglass outer coating (i.e., composite) or a fiberglass outer wall (i.e., jacketed).
- **Spill and Overfill Equipment:** Spill and overfill protection equipment is required if the UST ever receives more than 25 gallons at a time. Facilities must utilize spill prevention equipment (e.g., spill catchment basins or buckets) to prevent the release of product when the transfer hose is detached from the fill pipe. Overfill prevention equipment shall be installed to prevent overfilling of the tank during transfer through one or more of the following methods:
  - Automatically shut off flow into the tank at 95 percent capacity (e.g., drop tube flapper valve)
  - Alert the transfer operator at 90 percent capacity with a high-level alarm
  - Alert the transfer operator at 90 percent capacity by restricting the flow of fuel[2]
  - Restrict flow 30 minutes prior to overfilling
  - Alert the transfer operator with high-level alarm one minute before overfilling
  - Automatically shut off flow to prevent tank-top fittings from product exposure

  Facilities must ensure that the chosen overfill method is functioning properly by having a qualified technician periodically examine and certify the equipment. Personnel should also properly maintain the spill equipment empty of liquids; periodically check the catchment basin to remove any debris; and periodically have a qualified tester test the device to ensure that it is liquid tight.

  Personnel should post signs that delivery persons can easily read, alerting them of the overfill devices and alarms in use at the facility.

[2] Ball floats and other vent restriction devices may not be installed, repaired, or replaced after October 13, 2015.

- **Secondary Containment:** Secondary containment must be provided for new petroleum storage tanks and piping so that the tank system can contain any released product until the product is detected and removed, thereby preventing the release of regulated substances into the environment. Double-walled tanks should be provided to contain a release from the inner tank and to allow for the detection of the failure of the inner wall.
- **Vent Pipes:** Vent pipe requirements for USTs should be in accordance with NFPA 30, including the following:
  - For Class I liquid tanks, vent pipes shall be located so that the discharge point is outside of buildings, higher than the fill pipe opening and not less than 12 feet above the adjacent ground level.
  - For tanks containing Class II or III flammable liquid, vent pipes from tanks shall terminate outside of buildings and higher than the fill pipe opening, with outlets above normal snow level. Normal snow level can be calculated by using the method presented in the International Building Code or another nationally recognized method.
- **Tank Openings:** Connections and openings for gauging, vapor recovery and fill pipes should be designed in accordance with NFPA 30, including the following:
  - Connections for all tank openings and manual gauging openings should be liquid tight.
  - Fill and discharge lines shall enter through the top, and fill lines shall be sloped toward the tank. Fill pipes that enter through the top shall terminate within 6 inches of the tank bottom.
  - Class I liquid tanks having a capacity of greater than 1,000 gallons shall be equipped with a tight fill device for connecting the fill hose to the tank.
  - Valves, openings and connections for tanks equipped with vapor recovery shall be designed in accordance with NFPA 30 and any other applicable requirements.
- **Release Detection:** All UST systems must be provided a method or combination of methods that can detect a release from any portion of the tank. The release detection method must be installed, calibrated, operated and maintained in accordance with the manufacturer's instructions and must meet the requirements of 40 CFR 280.43 and 40 CFR 280.44. The chosen method must be capable of detecting a leak rate with a probability of detection of 0.95 and a probability of false alarm of 0.05. Facilities should have documentation from the manufacturer, vendor, or installer indicating that the method can meet the performance requirements. Acceptable methods of release detection include:
  - Automatic tank gauging systems
  - Secondary containment with interstitial monitoring
  - Vapor monitoring
  - Groundwater monitoring
  - Statistical Inventory Reconciliation
  - Agency approved methods that meet the performance standard

  The following release detection methods can also be used under certain conditions for tanks installed on or before April 11, 2016:

  - **Tank Tightness Testing with Inventory Control**: This method is generally allowed for only 10 years (40 CFR 280.41). After such time, facilities must switch to one of the more permanent methods listed above.
  - **Manual Tank Gauging:** Tanks of 1,000 gallons or less can use this method as the sole release detection method. Tanks with a capacity between 1,001 and 2,000 gallons can use this method if

combined with periodic tank tightness testing. Tanks with volumes greater than 2,000 gallons cannot use manual tank gauging as a method of release detection.

For piping associated with a UST system, the following release detection requirements must be met:

– **Pressurized Piping:** Pressurized piping must have an automatic line leak detector that can detect a leak at least as small as 3 gallons per hour at 10 pounds per square inch line pressure within 1 hour. Upon detection, the system must restrict product flow, shut off product flow, or trigger an audible or visual alarm. Pressurized piping must also have either an annual line tightness test conducted in accordance with 40 CFR 280.44(b) or one of the permanent monthly monitoring methods for tanks (i.e., secondary containment, groundwater or vapor monitoring, or an agency approved method meeting the performance criteria).

– **Suction Piping:** Suction piping requires line tightness testing that meets the standards of 40 CFR 280.44(b), or one of the permanent monthly monitoring methods for tanks (i.e., secondary containment, groundwater or vapor monitoring, or an agency approved method meeting the performance criteria). Suction piping does not require release detection if the following conditions are met:

  - Below-grade piping operates at less than atmospheric pressure
  - Below-grade piping is sloped so that the contents of the pipe will drain back into the storage tank if suction is released
  - Only one check valve is included in each suction line
  - The check valve is located directly below, and as close as practical to, the suction pump
  - A method is provided that allows compliance with the above conditions to be readily determined

6.4.4 Installation and Certification

All tanks and piping must be properly installed and tested in accordance with the manufacturer's instructions. The following installation procedures may be used:

- API RP 1615, *Installation of Underground Petroleum Storage System*
- PEI RP 100, *Recommended Practices for Installation of Underground Liquid Storage Systems*
- American Society of Mechanical Engineers (ASME) B31.4, *Liquid Petroleum Transportation Piping System*

One of the following testing, inspection and certification methods should be used to demonstrate the proper installation:

- The installer shall be certified by the tank and piping manufacturers and by the regulatory agency.
- The installation shall either be inspected and certified by a registered professional engineer with education and experience in UST system installation or shall be inspected and approved by the regulatory agency.
- The manufacturer's installation instructions (e.g., tank tightness tests, verification of fitting and tank integrity, ventilation of tank position and anchors, validating cathodic protection) have been performed and completed.

All UST system repairs must be made in accordance with 40 CFR 280.33 and nationally recognized standards or according to independent laboratory testing requirements. Within 30 days of repair completion, all repaired UST systems must be tightness tested in compliance with 40 CFR 280.43(c) and 40 CFR 280.44(b).

6.4.5 Closure

USTs may be closed either temporarily or permanently in accordance with the following requirements:

- **Temporary Closure:** USTs may be closed temporarily under certain conditions. Operation and maintenance of corrosion protection and release detection must continue during temporary closure. If the UST is temporarily closed for 3 months or more, lines and pumps must be capped and secured, and vent lines left open. Some states have a limit on how long a tank can be temporarily closed and may have other requirements.
- **Permanent Closure:** Facilities must notify the regulatory agency at least 30 days prior to final closure. Facility personnel must conduct a site assessment to determine if contamination is present. The UST must be excavated and removed or left in place and filled with an inert substance, such as sand or gravel. Some states require approval to leave a UST in place. Facilities must keep closure documentation for three years or mail the records to the appropriate regulatory agency.

6.4.6 Operations and Maintenance

Regular upkeep of UST system equipment, operations and monitoring methods is performed by facility operators. Some O&M activities occur at a specific frequency (e.g., every 30 days), while others are performed on an ongoing basis. O&M activities and schedules vary for each release detection method, and some states may require additional or more frequent O&M tasks. Examples include:

- Monitor alarms and report any spills or signs of release.
- Maintain spill buckets clean and dry (i.e., free of water, product and debris).
- Provide release detection monitoring for tanks (40 CFR 280.41(a), 40 CFR 280.43).
- Provide release detection monitoring for piping (40 CFR 280.41(b), 40 CFR 280.44).
- Perform rectifier inspections for impressed current cathodic protection systems (40 CFR 280.31(c)).

6.4.7 Testing

Periodic testing of UST system integrity and/or functionality must be performed by a certified tester and records must be maintained in accordance with 40 CFR 280.45. Some states may require additional or more frequent testing, additional tester certifications, and longer records retention periods.

Annual testing may include:

- Line tightness testing of pressurized piping (40 CFR 280.41(b))
- Line leak detector functionality testing for pressurized piping (40 CFR 280.40(a))
- Release detection monitoring equipment certification (e.g., automatic tank gauging console, automatic tank gauging probe, tank interstice sensors, piping sump sensors) (40 CFR 280.40(a)(3))

Triennial (three-year) testing may include:

- Line tightness testing of suction piping that does not meet the definition of safe suction piping in 40 CFR 280.41(b)(1)(ii) (40 CFR 280.41(b)(2)(ii))
- Spill containment device testing (40 CFR 280.35)
- Containment sump testing (when used for interstitial monitoring) (40 CFR 280.35)
- Overfill prevention device testing (e.g., flapper valves, high level alarm, ball float) (40 CFR 280.35)
- Cathodic protection system testing (40 CFR 280.31)

Five-year testing may include:

- Tank tightness testing (when used for release detection) (40 CF 280.43(c))

6.4.8 Tank Inspections

Facility operators perform periodic walkthrough inspections of UST facilities and maintain records in accordance with 40 CFR 280.36(b). These inspections include:

- Monthly (30 day) walkthrough inspection of spill prevention equipment and release detection equipment in accordance with 40 CFR 280.36(a)(1)(i)
- Annual walkthrough inspection of containment sumps and handheld release detection equipment in accordance with 40 CFR 280.36(a)(1)(ii)

6.4.9 Training

Facility owners and operators must complete training in the proper operation of UST systems, in accordance with 40 CFR 280 Subpart J. At least one individual, typically a supervisor, must complete Class A and Class B training, which is typically obtained through the state agency or a private vendor. General operators must complete Class C training, which is often obtained from Class A/B operators. Some states require periodic retraining of operators. Documentation of operator training must be maintained in accordance with 40 CFR 280.245.

6.5 Aboveground Storage Tanks

6.5.1 General

An AST system that stores oil is regulated primarily under 40 CFR Part 112. These regulations define ASTs as any bulk storage container such as day tanks, transformers, elevator reservoirs, and/or barrier reservoirs with a capacity of 55 gallons or more that is used to store oil, including those used to store oil before use or while being used. ASTs may be aboveground, partially buried, bunkered, or in a vault. Oil-filled electrical, operating, or manufacturing equipment is not considered an AST[3].

6.5.2 Design Standards

Facilities must design all ASTs and piping according to 40 CFR Part 112, NFPA 30 (Chapter 21), 29 CFR Part 1910, American Petroleum Institute standards, and state and local requirements. Many states have adopted fire codes, technical standards and permitting or registration requirements to regulate ASTs. The most common provisions are secondary containment standards, such as dike construction, impervious lining and volume capacity requirements. Other requirements include release detection, corrosion protection, overfill protection, piping and valve standards, as well as impermeable barriers or double bottoms for new ASTs. Chapter 21 of NFPA 30 includes the following requirements for ASTs exceeding a 660-gallon capacity:

- Location and spacing of ASTs shall be in accordance with NFPA 30.
- Liquefied propane gas containers shall be separated from flammable or combustible-liquid storage tanks by 20 feet.
- Volume of diked area shall not be less than the capacity of the largest tank within the diked area and should meet other NFPA 30 requirements.
- Tanks taken out of service or abandoned shall be emptied of liquid, rendered vapor-free, and safeguarded against trespassing.

3 Transformers containing 55 gallons or more of dielectric fluid, as well as hydraulic fluid reservoirs for elevators or other equipment should be included in an SPCC plan.

- When vent pipe outlets for tanks storing Class I liquids are adjacent to buildings or public ways, vents should discharge 12 feet above ground level. In addition, facilities must consider the placement of vent pipe outlets relative to building openings (e.g., air intakes).

AST design requirements associated with spill prevention, control and countermeasures (40 CFR Part 112) are described later in this chapter.

6.5.3 Closure

AST closure requirements are dependent on the locality in which the tank is situated. At a minimum, the following actions must occur as part of AST closure:

- All fuel and sludge must be removed from the tank and associated piping by a licensed waste hauler and a disposal manifest must be retained with closure documentation.
- The tank must be confirmed vapor-free before the tank is cut apart or transported off-site for disposal. A disposal manifest for the tank should also be retained with closure documentation.
- If possible, all piping should be removed and disposed of with the tank. If the piping runs underground, the locality may require soil sampling from under the piping.

6.5.4 Operations and Maintenance

There is no regulatory requirement to have an O&M plan for an AST system. However, all O&M procedures detailed in the tank manufacturers procedures should be followed. All tank repairs and maintenance should be documented, and records should be retained for the life of the AST.

6.5.5 Testing

There are no federal testing requirements for ASTs. There may be state or local testing requirements that must be followed. If there are state and/or local testing requirements, they should be detailed in a site-specific O&M manual. Certain AST manufacturers require periodic testing to maintain the tank warranty.

6.5.6 Tank Inspections

Monthly tank inspections are required for ASTs that are covered under 40 CFR Part 112. A monthly inspection form should be included with the site-specific SPCC plan. At a minimum, this form should include the following:

- Tank shell condition assessment (e.g., observations of corrosion, leaks)
- Piping condition assessment (e.g., observations of corrosion, leaks)
- Other equipment condition (e.g., ladders, platforms)
- Assessment of tank openings (are they all closed tightly, are weighted vent caps operable)
- Assessment of the tank gauge operation
- Inspection of the area around the tanks for staining or other evidence of leakage or spills

6.5.7 Training

Initial SPCC training is required for new tank operators. This site-specific training should be developed with the SPCC Plan. An annual refresher is required for all tank operators.

6.6 ASTs Inside Buildings

Tanks shall not be permitted inside buildings unless the storage of liquids in outside underground or aboveground tanks is not practical because of government regulations, temperature considerations, or production considerations. In such circumstances, facilities shall design and maintain the tanks in accordance with 29 CFR Part 1910, 40 CFR Part 112, and NFPA 30 where applicable. Chapter 4 of the EPA Facilities Safety Manual discusses in more detail the requirements such as separation, location and ventilation of inside chemical storage areas.

6.7 Spill Prevention and Control Planning

EPA facilities that meet the applicability criteria of 40 CFR Part 112 shall determine the potential spill risks associated with storing petroleum and hazardous substances and shall perform an assessment of the magnitude of these risks to facilitate effective prevention and control planning. Facilities must comply with the SPCC requirements if the facility has (1) a total aboveground oil storage capacity of more than 1,320 gallons; or (2) a total underground buried storage capacity of more than 42,000 gallons.

Facilities that meet the above criteria must comply with the following design and operational requirements:

- **Determination of Potential Spill Risks:** Potential spill risks are presented by petroleum storage vessels of all kinds, including aboveground, underground and internal storage tanks; container and drum storage areas; flow systems (valves and controls); waste treatment and disposal areas; and power transformers containing dielectric fluid with a capacity of 55 gallons or more. An accurate inventory of these spill risks shall be documented, including the tank area, size, volume, storage capacity, contents and function. A facility layout shall be prepared identifying the spill risk areas and probable dispersion pathways, topography, facility boundaries and all buildings and structures. The preventive systems, sources of water for firefighting, and service and emergency facilities relative to the spill risk areas shall be clearly represented in the layout. Major community receptors related to the spill risk area shall be represented on the layout or on a separate layout.
- **Risk Assessment:** Spill prevention and control planning requires performance of a risk assessment of the type of material storage, the quantity and type of material, and the incompatible surrounding storage conditions. There should be an evaluation of whether multiple or single releases could occur and what impact the release would have given the potential exposure pathways, direction and rate of spill flow, and the sensitive environmental areas and natural resources surrounding the storage area and facility. Sensitive environmental areas may include waterways, wetlands, recreational and park areas, forests, and wildlife sanctuaries. Natural resources, such as fish and wildlife, forest, waterways, agriculture, and groundwater critical to the local community, shall be assessed and the required measures taken to mitigate risk.
- **Secondary Containment for Covered Facilities:** Facilities shall have appropriate secondary containment or diversionary structures to prevent discharged petroleum products from reaching navigable waters. These may include dikes, berms and retaining walls; curbing; culverts, gutters, or other drainage systems; weirs, booms, or other barriers; spill diversion ponds; retention ponds; and sorbent materials. ASTs manufactured with integrated secondary containment (double-walled tanks) are most commonly used.
- **Secondary Containment for Bulk Storage Tank Systems:** Bulk storage tanks shall be compatible with the material stored and provide secondary containment for the entire contents of the largest tank plus freeboard for precipitation. These tanks shall include drainage and alternative containment, high-liquid-level alarms and pump, communication, and liquid-level sensors and gauges in accordance with 40 CFR 112.8(c). Facilities must position portable tanks to prevent spills from reaching navigable waters and away from areas prone to flooding.
- **Drainage Systems:** Facilities must control drainage of diked storage areas by using manual open/close valves. Undiked areas must drain into ponds, lagoons, or catchment basins that are designed to avoid flooding. Facilities shall use a diversion system to retain uncontrolled spills when there is final discharge of all in-plant ditches. In addition, facilities shall create treatment units for drainage, which can be used for gravity flow or backup pumping systems. Drainage areas shall prevent oil from reaching navigable waters in the event of equipment failure or human error.
- **Security:** Security measures for tanks must follow the provisions of 40 CFR 112.7(g), including fencing, entrance gates with locks, locking valves and pump controls, capped, locked and marked transfer points, and adequate lighting for visibility at night.

- **Facility Transfer Operations:** Aboveground pipelines shall be properly located allowing for regular integrity and leak inspections. Pipe supports shall avoid abrasion and corrosion and allow for expansion and contraction. Newly installed or replacement buried piping must have a protective wrapping and coating. If a pipeline is expected to be out of service for an extended period of time, facilities must cap and/or blank flange the terminal connection design of the transfer point and mark the origin.

6.8 Reporting and Recordkeeping

EPA facilities are responsible for evaluating federal, state and local codes and regulations to identify all applicable reporting and recordkeeping requirements. These requirements vary based on factors such as the location, type of facility and equipment installed. Examples of reporting and recordkeeping requirements for petroleum storage that may apply to EPA facilities include:

- Closure notification forms for ASTs and USTs and documentation of compliance with closure requirements
- Compatibility documentation (e.g., for storage of biofuels)
- Documentation of component repairs and post-repair testing
- Inspection records (e.g., monthly AST inspections, monthly and annual UST walkthroughs)
- O&M manuals for system components (e.g., written performance claims and schedules of required calibration and maintenance for release detection systems for USTs)
- Records of testing, inspection and certification of tank system components (e.g., spill prevention equipment, release detection containment sumps, overfill high level alarm, cathodic protection system, release detection equipment certification)
- Rectifier log for impressed current systems for USTs
- Registration forms for installation of ASTs and USTs
- Registration modification for ownership transfer, upgrade, replacement or change in operations
- Release detection records for piping and tanks (e.g., interstitial monitoring records)
- Site assessments (e.g., for tank closure or for groundwater/vapor monitoring)
- SPCC plans
- Suspected or confirmed releases
- Tank design diagrams, as-built drawings and manufacturer specifications
- Tank inventory records (volumes of oil) and fuel delivery records
- Training records (e.g., SPCC training, UST operator training)

7. Toxic Substances Management

7.1 Purpose

This chapter describes standards for the safe management of hazardous and toxic substances, including asbestos, lead, mercury, PCBs and radon.

7.2 References

Unless otherwise specified, management and abatement of toxic substances shall follow the guidelines specified in this chapter. Further guidance and resources for EPA facilities are also listed in Table 7-1. See Chapter 4 of the EPA Facilities Safety Manual for further guidance on hazardous material storage and management.

Table 7-1: References for Toxic Substances Management

Topic	References
Asbestos	*Guidance for Controlling Asbestos Materials in Buildings*, EPA 560/5-85-024 (June 1985)
	EPA website: Information for Owners and Managers of Buildings that Contain Asbestos
	EPA SHEMP Guideline 22, *Asbestos Procedures and Programs for Employees*
Lead	*Protect Your Family from Lead in Your Home*, EPA 747-K-12-001 (March 2021)
	EPA website: 3Ts for Reducing Lead in Drinking Water
Mercury	*National Elemental Mercury Response Guidebook*, EPA (March 2019)
	EPA websites: Cleaning Up a Broken CFL: Recommendations for When a CFL or Other Mercury-Containing Bulb Breaks What to Do if a Mercury Thermometer Breaks What to Do If You Spill More Mercury Than the Amount in a Thermometer
PCBs	*TSCA Storage and Disposal Requirements for Fluorescent Light Ballasts*, EPA (August 2015)
	EPA website: Polychlorinated Biphenyls (PCBs)
Radon	EPA website: Radon

7.3 Asbestos

Asbestos, and facility-related products that contain asbestos, shall not be installed in any EPA facility. Existing asbestos shall be managed in accordance with the EPA SHEMP Guideline 22, *Asbestos Procedures and Programs for Employees*. Specific procedures related to asbestos-containing materials (ACM) are as follows:

- Ensure that the facility has been inspected for ACM in accordance with 29 CFR 1926.1101 and 40 CFR Part 61 Subpart M. Ensure that leased space is, or has been, inspected or certified for the presence of asbestos.
- If ACM is present, and if it is in good condition and is not likely to be disturbed, ensure that a management program is implemented to manage the asbestos in place in accordance with the EPA's website Information for Owners and Managers of Buildings that Contain Asbestos.
- If ACM is present and is not in good condition or is likely to be disturbed during routine operations or construction activities, the asbestos must be abated in accordance with the EPA's website Information for Owners and Managers of Buildings that Contain Asbestos and the criteria contained in 29 CFR 1926.1101.
- Ensure that a pre-alteration asbestos assessment is performed, supplementing available information as appropriate, for any activity that may disturb any ACM. Conduct the asbestos assessment in accordance with the guidelines and requirements mentioned above.

7.4 Lead

All facility construction, modification and renovation actions are prohibited from using lead-based paints or any lead-containing materials. When a construction activity requires sanding, burning, welding, or scraping of existing painted surfaces, the paint must be tested for lead content before any such activities begin. If any lead is found, appropriate risk-control measures must be implemented in accordance with 29 CFR 1910.1025 and 29 CFR 1926.62 for lead and 29 CFR 1926.353 for ventilation when welding or cutting.

Lead compounds in paints and other interior coatings are of particular concern in childcare facilities. In these facilities, all surface coatings should be tested for lead, and coatings should be removed if they contain lead. For further guidance, see the EPA publication *Protect Your Family from Lead in Your Home*.

Potable water systems components, such as piping, valves, fittings, water coolers and fixtures, shall conform with requirements of the EPA National Primary Drinking Water Regulations for lead and copper (40 CFR Parts 141 and 143). Components shall not be incorporated unless bearing the NSF/American National Standards Institute (ANSI) Standard 61 mark, indicating that the product complies with the health effects requirements of NSF/ANSI Standard 61 for materials designed for contact with potable water.

Following the completion of a major renovation, new construction, or any modification to the water system, the potable water system within the building, including the potable water supply main as well as at several affected points of use, shall be tested for lead and copper content in accordance with the EPA's *3Ts for Reducing Lead in Drinking Water*. Testing of the building's potable water system and the potable water supply main shall be coordinated with the local water company, county health department and the state environmental protection agency, as applicable.

7.5 Mercury

Elemental mercury can be found in materials such as thermometers, thermostats, barometers, manometers, fluorescent lamps and some electrical switches. It may also be found in laboratory samples. When spilled, elemental mercury breaks into smaller droplets which can go through small cracks or become strongly attached to certain materials. At room temperature, exposed elemental mercury can evaporate to become an invisible, odorless, toxic vapor. Materials containing mercury must be properly managed during use, storage and disposal to reduce potential release and exposure.

The Mercury Export Ban Act went into effect in 2008 with the goal of reducing the use of mercury for commercial purposes. Materials containing mercury should be avoided and eliminated whenever possible and alternatives with no mercury should be selected instead.

7.5.1 Spills

Due to the concerns noted above, special care should be taken when cleaning up broken mercury-containing lamps and equipment. Recommended cleanup instructions for broken lamps can be found at https://www.epa.gov/mercury/cleaning-broken-cfl. Recommended cleanup instructions for broken thermometers can be found at https://www.epa.gov/mercury/what-do-if-mercury-thermometer-breaks.

Additional cleanup guidance and reporting requirements for spills of more mercury than the amount in a thermometer can be found at https://www.epa.gov/mercury/what-do-if-you-spill-more-mercury-amount-thermometer.

7.5.2 Disposal

Mercury is a common ingredient in certain lamps, such as fluorescent lamps, compact fluorescent lamps and high intensity discharge lamps. Waste lamps that contain enough mercury to exceed the toxicity characteristic leaching procedure (TCLP) level of 0.2 milligrams per liter are hazardous wastes regulated under RCRA. Upon removal of mercury-containing lamps for disposal, facilities must determine if the lamps are considered hazardous by obtaining manufacturer information regarding the mercury content of the lamps. Alternatively, the lamps may be

tested as described above (TCLP); however, it is recommended that the lamps be classified as mercury-containing waste in lieu of the testing procedure.

Waste mercury-containing lamps must be managed either under the traditional hazardous waste regulations or as universal wastes. If the lamps are managed as hazardous wastes, facilities must follow the hazardous waste generator requirements described in Chapter 5 of this volume. Lamps may also be managed under the streamlined provisions of the Universal Waste Rule (40 CFR Part 273), created to encourage the recycling of consumer products with specific toxic or hazardous constituents. Universal waste standards require the facility to:

- Store unbroken lamps in a box or fiber drum to prevent breakage and keep that container in a secure, protected area.
- Label the container "Universal Waste Lamps," "Waste Lamps," or "Used Lamps" and mark it with the date on which accumulation began.
- Have these lamps collected by or deliver them to an authorized lamp recycler, hazardous waste transporter, or another universal waste handler within one year of the collection start date.

Lamp wastes generated in small quantities (see "Very Small Quantity Generators" in Chapter 5 of this volume) and used lamps that do not test hazardous under RCRA can generally be disposed of in a properly managed municipal solid waste landfill (RCRA Subtitle D facility). Facilities must check with state environmental agencies for information on more stringent disposal requirements.

Waste mercury-containing equipment, such as thermometers and waste laboratory samples containing mercury that exceed the TCLP threshold must also be managed in accordance with hazardous or universal waste regulations as described above and in Chapter 5 of this volume.

7.6 Polychlorinated Biphenyls

The Toxic Substances Control Act Section 6(e) prohibits the manufacture, processing and distribution in commerce of PCBs after 1978. Therefore, EPA facilities shall not install any transformers, capacitors, switches, or other types of materials and electrical equipment containing PCBs. All dielectric fluid-containing equipment currently in use, including transformers and capacitors manufactured before 1978, must be evaluated to determine PCB content. Equipment found to contain PCBs must be labeled in accordance with 40 CFR 761.40 and registered and should be prioritized for removal.

Light ballasts used within fluorescent light assemblies may also contain PCBs if manufactured before 1978. Ballasts manufactured after 1979 that do not contain PCBs are labeled "No PCBs." If a ballast is not labeled "No PCBs," it must be assumed to contain PCBs. Such ballasts must be evaluated for PCB content upon removal for routine maintenance or as part of formal energy conservation upgrades. PCB concentration information can often be obtained by contacting the ballast manufacturer and providing the equipment lot and serial number. Intact ballasts (non-leaking) should first be offered to a PCB ballast recycling and recovery facility. Ballasts found to be leaking must be considered a hazardous PCB waste and sent to a facility approved to receive such waste for disposal. A summary of Toxic Substances Control Act Storage and Disposal Requirements for Fluorescent Light Ballasts can be found at https://www.epa.gov/sites/default/files/2015-08/documents/ballastchart.pdf. Additional resources related to managing PCBs in EPA facilities can be found at https://www.epa.gov/pcbs.

PCBs may also be present in EPA laboratories as analytical standards. For analytical standards with concentrations of 50 parts per million (ppm) or greater, the storage container/area must be marked with the PCB label and inventoried as required. All PCB wastes resulting from laboratory activities (e.g., spent samples (>50 ppm), residuals, contaminated pipettes) must be stored and disposed appropriately as described below.

Special handling and storage requirements apply to any waste material with a concentration greater than 50 ppm of PCBs. Items containing over 50 ppm of PCBs may be stored for up to one year prior to disposal. Storage facilities must meet the following design requirements:

- Be protected by roof and walls to prevent the infiltration of rainwater or runoff of PCBs, and have smooth, impervious flooring without drains, cracks, or expansion joints.
- Have continuous curbing of a minimum 6-inch height sufficient to contain at least 25 percent of the volume of containers being stored.
- Have posted on the outside entrance of the facility or area the official PCB mark shown in 40 CFR 761.45.

In addition, PCB storage areas must be inspected at least every 30 days and records of the inspections must be maintained. The EPA allows for temporary storage (up to 30 days) of PCB wastes in areas that do not meet the design requirements above, provided that these temporary storage areas are labeled, and the containers are marked and not leaking. SPCC plans must also be prepared and implemented for temporary storage areas where containers of liquid PCBs at concentrations between 50 and 500 ppm are stored (anything above 500 ppm cannot be stored in a temporary storage area). SPCC plans are not required for long-term storage areas. Refer to Chapter 6 of this volume for a description of SPCC requirements.

If the facility disposes of PCB wastes, the facility must obtain an EPA RCRA identification number, prepare hazardous waste manifests for all PCB wastes shipped off site and obtain certificates of disposal for all shipments. Additionally, some states may have requirements that are more stringent than federal regulations.

7.7 Radon

The EPA seeks to limit the presence of radon and its daughter degradation products at EPA facilities. Building materials, such as concrete and aggregate stone, shall be selected from sources with low probability of radioactivity. Radon concentrations identified above the EPA action level of 4 picocuries per liter (pCi/L) should be addressed through appropriate engineering and administrative controls. In areas known to have high radon in structures, buildings shall be designed to include preventive techniques such as caulking of all joints between concrete slab and walls below grade, caulking of all pipe penetrations, and venting of all non-occupied spaces below grade. Radon in drinking water supplies, measured as combined radium-226 and radium-228, shall not exceed 5 pCi/L.

Following the completion of a major renovation, new construction, or facility modification to a building located in a radon-prone area, all below-grade building areas designated as occupied space shall be tested for the presence of radon prior to occupation. Additional resources related to managing radon in EPA facilities can be found at https://www.epa.gov/radon.

7.8 Reporting and Recordkeeping

EPA facilities are responsible for evaluating federal, state and local codes and regulations to identify all applicable reporting and recordkeeping requirements. These requirements vary based on factors such as the location, type of facility and equipment installed. Examples of reporting and recordkeeping requirements for toxic substances management that may apply to EPA facilities include:

- Asbestos management plan
- Hazardous materials survey
- PCB storage area inspection records and disposal manifests
- Potable water test results
- Radon test results
- TCLP test results

8. Pesticide Management

8.1 Purpose

This chapter describes the safe handling and proper application of pesticides at EPA owned, leased or occupied facilities. Specific topics discussed in this section include pesticide storage and application, and the use of integrated pest management.

8.2 References

Unless otherwise specified in this EPA Facilities Environmental Manual or approved by RPSD and SOHSD, pesticide storage areas shall conform to applicable local building codes and NFPA 101. Pesticide application shall conform to applicable state standards based on 40 CFR Part 171.

8.3 Pesticide Storage

Any facility storing pesticides with a toxicity category of I or II (Category I being the highest toxicity category) according to 40 CFR Part 156, and whose labels are required to bear the signal words “Danger,” “Poison,” or “Warning,” or the skull and crossbones pictogram, should inventory and monitor its storage facilities even if application is performed by a licensed contractor. Pesticide storage areas shall be identified by signs placed on rooms, buildings, and fences to advise of the contents and warn of their hazardous nature. Signage on the outside of pesticide storage areas shall include “Danger,” “Poison,” or “Pesticide Storage,” or use the NFPA 704 hazard classification system. Pesticide storage facilities should be designed with the following safeguards:

- Facilities should be dry, well-ventilated areas within a separate room, building, or covered area that is provided with fire protection.
- Eyewash and safety shower equipment should be available to users of the pesticide storage area (See Chapter 5 of this volume for information on emergency equipment and showers).
- Facilities should be protected by security measures such as locks and fences to prevent unauthorized entry.
- To prevent runoff of pesticides and pesticide-contaminated residues, facilities should have secondary containment systems such as dikes, berms, or other devices that are separate from the facility sanitary sewer or stormwater collection system.
- Where feasible, a wash basin should be present for collecting and containing wastewater from decontaminating pesticide application equipment.

8.4 Pesticide Use and Disposal

Pesticide application at EPA facilities shall be conducted in accordance with the pesticide label instructions. Protective equipment shall be worn while handling and mixing pesticides. Restricted use pesticides may be applied only by or under the direct supervision of trained and certified applicators.

Disposal instructions for excess and residue pesticides are typically described on the pesticide label. All residues and rinsates should be collected and used according to their labeled application method or they should be mixed with similar solutions of the pesticide. Alternatively, the pesticide residues may be given to another pesticide applicator to use according to label directions. If the pesticide is a restricted use pesticide, it can be given only to a licensed applicator. If the pesticide will be disposed, it must be sent to an approved disposal facility. Refer to Chapter 5 of this volume for requirements for disposal of pesticides classified as hazardous wastes.

8.5 Integrated Pest Management

Integrated pest management (IPM) is an effective and environmentally sensitive approach to manage pest damage by the most economical means and with the least possible hazard to people, property, and the environment. IPM programs take advantage of all pest management options including, the judicious use of pesticides. Prevention and control of pest populations is focused on creating inhospitable environments, by removing the basic elements that pests need to survive (food, water and shelter) or by blocking their access into buildings. Pests can also be managed by other methods such as traps and vacuums.

EPA facilities shall consider IPM measures to reduce the need for pesticide applications, including sanitation and structural repair, and employing physical and mechanical controls such as screens, traps, weeders, and air doors. For example, special attention shall be given to minimizing development of rodent warrens (e.g., nests) in areas such as garbage collection areas, dumpsters and cafeterias.

EPA facilities must ensure that they are developing IPM plans and implementing IPM best practices.

8.6 Antifouling Paints

Tributyltin compounds are registered for use in paint formulations as antifoulants on vessel hulls and other marine structures to inhibit the growth of aquatic organisms such as barnacles and algae. All tributyltin antifouling paints used in EPA marine vessels shall meet the following conditions to minimize potential impacts on human health and the environment:

- Average daily release rate of 4.0 milligrams per organism per square centimeter per day or less
- Not used on nonaluminum vessels that are less than 82 feet long (non-tributyltin paints must be used on these types of vessels)
- Classified as restricted pesticides (only sold to and applied by certified commercial applicators)
- Labeled in compliance with the Occupational Safety and Health Administration regulations

In addition, antifouling paints containing mercury shall not be used for interior finishes, as they are intended solely for exterior applications. A list of certified antifouling paint manufacturers can be obtained by contacting the EPA Office of Pesticide Programs, Antimicrobials Division.

8.7 Reporting and Recordkeeping

EPA facilities are responsible for evaluating federal, state and local codes and regulations to identify all applicable reporting and recordkeeping requirements. These requirements vary based on factors such as the location, type of facility and equipment installed. Examples of reporting and recordkeeping requirements for pesticides that may apply to EPA facilities include:

- IPM plan
- Pesticide applicator certification records
- Pesticide inventory
- Pesticide storage facility inspection records

9. Radioactive Materials and Ionizing Radiation Producing Device Management

9.1 Purpose

This chapter describes the methods for managing radioactive materials and other sources of ionizing radiation (i.e., X-ray machines) to ensure regulatory compliance and protection of the public, workers and the environment at EPA owned, leased or occupied facilities. Each EPA facility that maintains a radioactive materials license, whether a general license or a site-specific license, or uses and maintains ionizing radiation-producing devices, must develop, document and implement a radiation protection program commensurate with the scope and extent of any regulated activities.

9.2 References

The primary federal agency with responsibility for the management of radioactive materials is the U.S. Nuclear Regulatory Commission (NRC). NRC licenses and regulates the commercial use of radioactive materials. NRC may relinquish portions of its regulatory authority to states, referred to as Agreement States. All operations involving radioactive material shall comply with the NRC regulations listed in Table 9-1 below, as well as state and local restrictions.

Ionizing radiation producing devices (i.e., X-ray machines) must be managed in accordance with applicable state and local regulations, and the EPA guidelines listed in Table 9-1. Refer to Section 4.7 of the EPA Facilities Safety Manual for further guidance on the management of ionizing radiation producing devices.

Further requirements and guidance for EPA facilities are also listed in Table 9-1. Suggested guidance documents and applicable sections of EPA SHEMP Guidelines that offer additional resources are provided in each section below.

Table 9-1: References for Radioactive Materials and Ionizing Radiation Producing Device Management

Topic	References
NRC Regulations	10 CFR Part 19 – Notices, Instructions, Reports to Workers: Inspection and Investigations
	10 CFR Part 20 – Standards for Protection Against Radiation
	10 CFR Part 21 – Reporting of Defects and Noncompliance
	10 CFR Part 30 – Rules of General Applicability to Domestic Licensing of Byproduct Material
	10 CFR Part 71 – Packaging and Transportation of Radioactive Material
EPA Guidance	EPA SHEMP Guideline 38, *Radiation Safety and Health Protection Program*
	EPA *Safety Guidelines for the Installation and Operation of X-Ray Generating Equipment at EPA Facilities*
Additional Guidance	*Air Cleaning Systems in DOE Nuclear Facilities*, DOE (DOE-STD-1269-2022, April 2022) *Handbook for Use with DOE-STD-1269-2022, "Air Cleaning Systems in DOE Nuclear Facilities"*, DOE (DOE-HDBK-1169-2022, April 2022)
	Health Physics Manual of Good Practices for Reducing Radiation Exposure to Levels That Are As Low As Reasonably Achievable (ALARA), DOE/Pacific Northwest Laboratory (PNL-6577)
	Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants, NRC/Federal Emergency Management Agency (NUREG-0654/FEMA-REP-1 Rev. 2)
	ANSI/Health Physics Society N43.3, *General Radiation Safety Installations Using Non-Medical X-ray and Sealed Gamma Ray Sources for Energies up to 10 MeV*

Topic	References
Additional Guidance (continued)	NRC Regulatory Guides: • 8.2, *Administrative Practices in Radiation Surveys and Monitoring* • 8.4, *Personnel Monitoring Device—Direct-Reading Pocket Dosimeters* • 8.7, *Instructions for Recording and Reporting Occupational Radiation Exposure Data* • 8.9, *Acceptable Concepts, Models, Equations, and Assumptions for a Bioassay Program* • 8.10, *Operating Philosophy for Maintaining Occupational Radiation Exposures As Low As Is Reasonably Achievable* • 8.25, *Air Sampling in the Workplace* • 8.28, *Audible-Alarm Dosimeters* • 8.29, *Instruction Concerning Risks from Occupational Radiation Exposure* • 8.34, *Monitoring Criteria and Methods to Calculate Occupational Radiation Doses* • 8.36, *Radiation Dose to the Embryo/Fetus* • 10.7, *Guide for the Preparation of Applications for Licenses for Laboratory and Industrial Use of Small Quantities of Byproduct Material*

9.3 Policy Statement

Operations involving radioactive materials handled at EPA facilities shall be conducted in accordance with this policy:

- All operations shall comply with the requirements and the intent of the facility license.
- All operations shall be performed only as directed in written procedures.
- All operations shall be performed under the direction of management.
- Personnel working with radioactive material shall be trained in the basic concepts of radiation safety.
- All required records shall be prepared and maintained in accordance with written procedures.
- The EPA is committed to the principle of keeping radiation doses ALARA.

EPA SHEMP Guideline 38, *Radiation Safety and Health Protection Program*, addresses the dose limitation system and ALARA principles for EPA facilities. Also refer to NRC Regulatory Guide 8.10, *Operating Philosophy for Maintaining Occupational Radiation Exposures As Low As Is Reasonably Achievable*, for methods for an acceptable ALARA program. Special considerations addressing the use of radioactive material are contained in the *Health Physics Manual of Good Practices for Reducing Radiation Exposure to Levels That Are As Low As Reasonably Achievable (ALARA)*, Pacific Northwest Laboratory (PNL-6577).

9.4 General Design Considerations

Design information (e.g., secure radiation storage areas, radioactive waste collection points, calibration areas, general facility shielding) that must be provided in license or permit applications should be reviewed to identify aspects of the design that are of particular interest to the NRC or the Agreement State, as appropriate. Consideration should also be given to configuring sample-receiving areas to accommodate the equipment to screen unknown samples for radiation contamination, as appropriate for the scope of facility operations. For a typical EPA laboratory facility, this information is available in NRC Regulatory Guide 10.7, *Guide for the Preparation of Applications for Licenses for Laboratory and Industrial Use of Small Quantities of Byproduct Material*.

9.5 Employee Training

In accordance with 10 CFR 19.12, persons that may receive 100 millirem (mrem) in a year must be instructed in the health protection issues associated with exposure to radioactive materials or radiation. NRC Regulatory Guide 8.29, *Instruction Concerning Risks from Occupational Radiation Exposure*, describes the instruction that should be provided to the worker concerning health risks from occupational exposure.

The EPA also requires sufficient training be provided to personnel working in designated radiation areas or around sources of ionizing radiation, and individuals in the radiation dosimetry program. In addition to basic radiation safety training, biennial refresher training and advanced radiation training for defined radiation workers must be included as part of the ongoing training program. EPA SHEMP Guideline 38 describes the knowledge base that should be demonstrated by successful completion of a competency examination for personnel required to attend radiation safety training.

9.6 Monitoring of Radiation

Radiation monitoring is an important element in the overall requirements for radiation protection. Requirements and guidance for monitoring are contained in EPA SHEMP Guideline 38. The guideline addresses monitoring for external and internal exposure, radon exposure, administrative control limits, and contractor and visitor monitoring.

EPA facilities must monitor exposures to radiation and radioactive material at levels sufficient to demonstrate compliance with dose limits established in EPA SHEMP Guideline 38. The EPA has established an Administrative Control Level of 500 mrem committed effective dose equivalent from intake plus external whole-body dose in any period of 12 consecutive months. To alert supervisors and workers to the constant need for maintaining good radiological protection practices, and to help ensure that long-term worker exposure does not exceed the Administrative Control Level, the EPA has established an Action Reference Level of 50 mrem per quarter whole-body external exposure or internal effective dose equivalent.

The standard personnel monitoring device for radiation exposure is the thermoluminescent dosimeter. Thermoluminescent dosimeters are exchanged quarterly, and their results are reported quarterly with a calendar-year summary. All workers participating in the monitoring and dosimetry program shall be notified in writing of their quarterly, or other exposure data as appropriate, even in the case where there is no detectable radiation exposure above normal background levels. Such notification would ordinarily be on a quarterly basis; however, if the 50 mrem per quarter Action Reference Level has been reached or exceeded, the SHEMP Manager and/or the Radiation Safety Officer shall be notified by telephone by the dosimetry service provider. The SHEMP Manager/Radiation Safety Officer shall then immediately notify the affected worker and the affected worker's supervisor, and the Radiation Safety Officer will initiate a review of the circumstances leading to the exposure data recorded by the thermoluminescent dosimeter badge.

EPA facilities with NRC site-specific licenses must also comply with the monitoring requirements of 10 CFR Part 20. The personnel monitoring program must provide for a continuing review of radiation exposure to individuals with mechanisms to assure against over exposure, and periodic reports to the individuals and the NRC. The requirements for recording individual monitoring results are contained in 10 CFR 20.2106. The following NRC Regulatory Guides address personnel monitoring:

- Regulatory Guide 8.2, *Administrative Practices in Radiation Surveys and Monitoring*
- Regulatory Guide 8.4, *Personnel Monitoring Device—Direct-Reading Pocket Dosimeters*
- Regulatory Guide 8.7, *Instructions for Recording and Reporting Occupational Radiation Exposure Data*
- Regulatory Guide 8.28, *Audible-Alarm Dosimeters*
- Regulatory Guide 8.34, *Monitoring Criteria and Methods to Calculate Occupational Radiation Doses*
- Regulatory Guide 8.36, *Radiation Dose to the Embryo/Fetus*

A radiological environmental management program should be established to monitor any potential exposure to the public and for the radiological impact of the facility's operations. An environmental monitoring program may include effluent air samples, water samples, soil samples, waste analysis and ambient radiation monitoring. Design engineers should consult the Radiation Safety Officer to determine if special considerations should be made for sampling location points.

Most EPA laboratories do not use sufficient quantities of radioactive material to require special emission control or monitoring equipment to meet established public radiation exposure limits in 10 CFR Part 20, Subpart D, beyond conventional laboratory engineering controls. Special use facilities or operations potentially handling significant quantities of radioactive materials should be evaluated on a case-by-case basis for specialized systems or controls necessary to fulfill established NRC limits in 10 CFR Part 20 or applicable license conditions.

9.7 Workplace Control for Airborne Radioactive Material

NRC requires the use of engineered controls (e.g., radioisotope fume hoods, glove boxes) as the primary means of protecting workers from exposure to airborne contaminants, including radioactive materials. Sealed sources generally require no additional special precautions. For the low concentrations of radioactive materials in powder or liquid form typically used at EPA facilities, the confinement afforded by a radioisotope laboratory fume hood will generally provide adequate control (see also Chapter 4 of the EPA Facilities Safety Manual and Chapter 7 of the A&E Guidelines for additional guidance). In general, airflow should always be from clean to contaminated areas, and ductwork and other components should include design features that minimize the potential for internal accumulation of radioactive materials as well as to facilitate decontamination. In some situations, the Radiation Safety Officer may determine that radioactive materials used by the facility are of low enough radioactivity to be used safely within a conventional laboratory fume hood.

Extensive guidance on design of systems for controlling airborne radioactive material, both in the workplace and in emissions from a facility, is available in the DOE standard for *Air Cleaning Systems in DOE Nuclear Facilities* and the associated *Handbook*.

9.8 Workplace Control for Surface Contamination

Facilities where unsealed radioactive sources or material will be used shall include design features to minimize the potential for contamination of surfaces with radioactive material and to facilitate decontamination. Construction materials and methods should be specified that minimize cracks, crevices, and porous materials that can readily accumulate contamination. Work surfaces should be sealed, and seamless flooring rather than tiles should be considered.

9.9 Access Control

NRC regulations contain requirements for “restricted areas.” Restricted areas are defined as any area to which the facility licensee limits access for purposes of protecting individuals against undue risks from exposure to radiation or radioactive materials. Such areas, including radioactive waste storage facilities, shall be posted in accordance with the radiation caution signs specified in 10 CFR 20.1901 through 20.1903.

Activities with radioactive material shall be performed within an area where physical access can be controlled. Space may be required at the egress to the restricted area to facilitate monitoring of personnel or items for radioactive contamination. Additionally, more stringent regulatory requirements for controlling access to smaller areas within the restricted area may apply depending on the radiation levels and quantities and form of radioactive material. High-hazard facilities with containment provided within the laboratory shall consider using special engineering design features such as an airlock with interlocked doors or special air-monitoring and warning systems. Lockable cabinets in secure storage areas are necessary for storing radioactive materials that are not in use. Design engineers must consult with individuals familiar with both the intended use of the facility and the applicable regulatory requirements to ensure that appropriate physical access controls are included in the design.

9.10 Shielding

Special shielding may be required to limit the radiation dose rates within the restricted area to levels consistent with EPA administrative limits for occupational radiation exposure and, outside of the restricted area, to levels specified in NRC regulations. Proper shield design requires knowledge of the maximum inventory (total activity level) of each isotope of radioactive material and where and how it will be used or stored in the facility. High-energy electronic radiation-generating devices (e.g., X-ray machines) may also require shielding. Detailed guidance

on radiation shielding design is available in ANSI N43.3, *General Radiation Safety Installations Using Non-Medical X-ray and Sealed Gamma Ray Sources for Energies up to 10 MeV* and the EPA's *Safety Guidelines for the Installation and Operation of X-Ray Generating Equipment at EPA Facilities.*

9.11 Radioactive Materials Waste Management

NRC regulations impose strict controls on the disposal of all forms of radioactive materials and waste. NRC regulations in 10 CFR 20.2003 impose strict conditions on the discharge of radioactive materials to sanitary sewers. In designing a new facility, determination should be made as to whether the quantities and chemical and physical forms of liquid radioactive wastes can be disposed of in accordance with those regulations. If not, a liquid radioactive waste and mixed waste (e.g., waste regulated under both NRC and RCRA) storage and treatment system must be provided. Facility design should provide for segregation of radioactive waste, where practicable, from all other types of liquid wastes, particularly hazardous chemicals.

Facilities that will use solid radioactive materials, other than sealed sources, which may generate radioactive waste should be provided with adequate space for temporary storage, packaging, monitoring and preparing shipments to an authorized disposal facility. Provisions should be made for monitoring potentially contaminated waste prior to packaging so that contaminated and uncontaminated wastes can be segregated. Depending on the types and quantities of radioactive material used in the facility, shielding and/or physical access controls may be required for the solid waste storage area.

Low-level radioactive mixed waste is regulated under both the NRC regulations and the hazardous waste management standards promulgated pursuant to RCRA. Therefore, the storage and management of these wastes require compliance with the requirements of this chapter and the hazardous waste standards in Chapter 5 of this volume. The generation of these wastes should be minimized.

9.12 Transport of Radioactive Materials

DOT, NRC and U.S. Postal Service regulations specify certain procedures, limits, and documentation requirements for radioactive material shipments. DOT regulates the shipments while they are in transit and sets standards for labeling and smaller quantity packages. NRC oversees the safety of the transportation of radioactive materials through a combination of regulatory requirements, transportation package certification, inspections and a system of monitoring to ensure that safety requirements are being met. DOT regulations for transporting hazardous materials, including radioactive materials, are contained in 49 CFR Parts 171 to 179. NRC has the responsibility for transferring radioactive materials that exceed Type A quantities as defined in 10 CFR Part 71. In addition, NRC is responsible for overseeing compliance of licensees for DOT regulations involving radioactive material. U.S. Postal Service Publication 52, *Hazardous, Restricted, and Perishable Mail* contains requirements for the transport of radioactive material through the mail.

9.13 Emergency Planning

EPA SHEMP Guideline 38 requires that written emergency plans and procedures be developed, implemented, and executed prior to the start of work involving radioactive materials. Depending on the quantity of radioactive material that a facility is licensed to possess, an NRC approved emergency response plan may also be required. The criteria and recommendations contained in the *Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants* are considered by the NRC to be acceptable methods for complying with NRC standards that must be met in onsite and offsite emergency response plans.

The facility design should emphasize the use of prevention features to limit the release of radioactive material in the event of an incident. Prevention is the use of design features (e.g., shielded storage containers, hardened storage rooms, filtration systems, secondary containment) to reduce the frequency of events that could result in radiological release. Prevention features should be incorporated into the design to ensure that the operational controls important to radiological safety are not compromised during an event. The design of systems for controlling radioactive material should consider events such as loss-of-power, fire and inclement weather to determine the impact on the safety systems ability to control radioactive material.

9.14 Reporting and Recordkeeping

Radiation protection programs and systems that support operations involving radioactive materials must be well documented. As part of the written radiation protection program, procedures, requirements on recordkeeping, reporting and retention of records should be addressed in accordance with NRC regulations. During the engineering and construction phase of any new installation that supports licensed activities, the drawings and operating instructions shall be documented and verified that the system is built and operates within specifications.

In accordance with EPA SHEMP Guideline 38, facilities must maintain a computer-based Radiation Safety Information System for storing exposure records for all participating EPA workers.

EPA facilities are responsible for evaluating federal, state and local codes and regulations to identify all applicable reporting and recordkeeping requirements. These requirements vary based on factors such as the location, type of facility and equipment installed. Examples of reporting and recordkeeping requirements for radioactive materials and ionizing radiation-producing device management that may apply to EPA facilities include:

- Agreement State communications
- Dosimetry records (NRC Form 5)
- Ionizing radiation surveys
- Material transfer and disposal records
- NRC communications
- Physical inventory
- Training records
- Wipe test results

10. National Environmental Policy Act

10.1 Purpose

The purpose of this chapter is to present procedural guidance for EPA Regional Site Mangers and Headquarters Project Managers on the requirements of the National Environmental Policy Act (NEPA). This chapter presents information and procedures for the proper implementation of NEPA and for the integration of environmental impact analysis/assessment into the EPA's project management process for property transfers, closures, acquisitions, new construction, renovations and new additions. The strategies and procedures stated in this chapter should be used for all projects employing building and facility funds and may be applied to projects employing alternative funding.

10.2 References

These guidelines are designed to comply with the NEPA guidance documents, regulations and statutes listed in Table 10-1 below. Unless otherwise specified herein, the execution of projects that are considered "major Federal actions," potentially causing environmental and socioeconomic consequences shall conform to the requirements of NEPA as specified in these references.

Table 10-1: References for the National Environmental Policy Act

Topic	References
NEPA Statute	The National Environmental Policy Act, 42 United States Code 4321 - 4347, as amended by Pub. L. 94-52, July 3, 1975, Pub. L. 94-83, August 9, 1975, and Pub. L. 97-258, § 4(b), Sept. 13, 1982
NEPA Regulations	40 CFR Parts 1500 to 1508 (CEQ NEPA Implementing Regulations)
	40 CFR Part 6 (EPA Procedures for Implementing NEPA and Assessing the Environmental Effects Abroad of EPA Actions)
NEPA Guidance	*National Environmental Policy Act Review Procedures for EPA Facilities*, EPA 200-K-16-001 (July 2017)

10.3 Overview of NEPA Process / General Program Requirements

NEPA is a decision-making process that requires all federal agencies to consider the environmental impacts of their actions and provide opportunities for public involvement. EPA actions that are not specifically exempt from NEPA must comply with NEPA through three possible levels of review:

- **Level 1 Analysis – Categorical Exclusion (CX):** This first level of NEPA review screens proposed projects against categories of actions "which do not individually or cumulatively have a significant effect on the human environment" (40 CFR 1508.4). Each federal agency develops a list of categories of actions specific to their work that do not significantly affect the environment. The EPA's list of CXs may be found in 40 CFR 6.204.
- **Level 2 Analysis – Environmental Assessment (EA):** For actions not eligible for a CX, an EA is required. The purpose of an EA is to determine whether a proposed action may significantly affect the environment. If the results of an EA indicate that there are no significant impacts or the significant impacts to the environment can be mitigated, then the EPA will issue a Finding of No Significant Impact, which may include mitigation measures to reduce the potential environmental and human health impacts to below significant.
- **Level 3 Analysis – Environmental Impact Statement (EIS):** If an EA determines that significant environmental impacts may result from a proposed action, then an EIS is required. An EIS provides a more detailed evaluation of the proposed action, potential mitigation and alternatives that may reduce impacts. In cases where the EPA anticipates that an action may significantly impact the environment, a decision can be made to prepare an EIS without first developing an EA. EPA regulations include a list of actions that

normally require an EIS (40 CFR 6.207(a)(1)). After a Final EIS is prepared and prior to its decision, the EPA must publish and make available to the public a Record of Decision, which provides the final decision for the proposed action and includes a description of the alternatives considered in the EPA's decision-making process and any commitments to mitigation measures. Note that EPA facilities projects rarely require an EIS.

Further information regarding each level of review, including a decision tree for the NEPA process, is included in Sections 4 through 7 of the *National Environmental Policy Act Review Procedures for EPA Facilities*, EPA 200-K-16-001 (July 2017).

10.4 EPA Responsibilities

The Responsible Official is the EPA official who is responsible for compliance with NEPA for an individual proposed action and will sign off on the NEPA documentation. An appropriate Responsible Official is designated for each EPA facilities project and is determined by the organization managing the project funding and decisions regarding the project. The Responsible Official may delegate its NEPA-related responsibilities to a level no lower than a Branch Chief or equivalent organizational level. If the EPA is working with GSA to construct or renovate leased space, then GSA is typically designated as the NEPA lead agency and will prepare the NEPA documentation. In certain instances, the EPA may prepare the appropriate documentation in lieu of GSA.

Further information regarding EPA staff roles and responsibilities, including the protocol for designation of the Responsible Official for an EPA facilities project, is included in Section 2 of the *National Environmental Policy Act Review Procedures for EPA Facilities*.

10.5 Project-Level Compliance

The NEPA review process should not be viewed as an independent activity, but rather as an integral component of a project's environmental compliance program. At the outset of a project, the NEPA review facilitates the assessment of project-specific variables, including regulatory, environmental and socioeconomic factors. To assist in identifying relevant project considerations, personnel overseeing NEPA review activities should consult with the appropriate Regional NEPA Coordinator. These individuals represent a valuable information resource and maintain access to recent or current NEPA documentation. The list of Regional NEPA Coordinators is available on the EPA's NEPA compliance website (http://www.epa.gov/nepa/regional-national-environmental-policy-act-contacts-and-environmental-impact-statements-state).

Regulatory factors include those requirements that need to be considered to achieve compliance with standards, permits and plans. Environmental factors must be evaluated to establish baseline conditions, determine site suitability and identify potential impacts. Socioeconomic considerations include potential effects on local residential dwellings, traffic, public utilities and facilities. A project-level evaluation worksheet that can be used to perform an initial assessment of project-specific variables in included in Appendix F of the *National Environmental Policy Act Review Procedures for EPA Facilities*. Other important factors, such as safety considerations, sustainability, energy conservation and integrated solid waste management programs, must also be considered in the design and assessment of major actions.

Environmental permits may be required for construction projects. The EPA is responsible for preparing the permit application and working with permitting authorities to identify permit conditions/considerations. Much of the data developed in support of permitting will be useful in the NEPA review process, and therefore it is critical that these two activities be closely coordinated.

10.6 Cross-Cutters

As part of the NEPA review process, the Responsible Official is responsible for determining the applicability of environmental laws, EOs and implementing regulations to the proposed action; these are generally referred to as "cross-cutters." Environmentally related cross-cutters require federal agencies to consider the impact that their programs and actions might have on particular resources. These considerations are usually integrated with the NEPA review process to reduce paperwork and the potential for delays and can result in better decisions by

considering all impacts to resources from a proposed action through the NEPA process. Therefore, coordination and/or consultation with the agencies administering cross-cutters should begin early in the NEPA process. An overview of cross-cutters most commonly applicable to EPA facilities projects is included in Appendix C of the *National Environmental Policy Act Review Procedures for EPA Facilities*.

10.7 Reporting and Recordkeeping

EPA facilities are responsible for evaluating federal, state and local codes and regulations to identify all applicable reporting and recordkeeping requirements. These requirements vary based on factors such as the location, type of facility and equipment installed. Examples of reporting and recordkeeping requirements for NEPA that may apply to EPA facilities include:

- Completed CX forms and attachments
- Completed EAs and all associated correspondence and documentation

11. Environmental Due Diligence Process

11.1 Purpose

This chapter describes the environmental due diligence process (EDDP) that must be applied when acquiring, transferring, or terminating the EPA's interests in real property.

11.2 References

Unless otherwise specified, EPA real property transfers shall follow the EDDP as described in the *Guidelines for Acquiring and Transferring EPA Real Property and Complying with the Community Environmental Response Facilitation Act (CERFA)*, EPA 100-B-00-002 (December 2000).

11.3 General Requirements

The EDDP requires the evaluation of the environmental condition of real property prior to transfer to allow the EPA to take appropriate steps to eliminate or minimize the EPA's potential or actual environmental risk or liability associated with that real property. The EPA's EDDP includes three phases:

- **Phase I – Preliminary Survey and Site Investigation:** This phase qualitatively characterizes the site and identifies any suspected areas of environmental contamination that may require further investigation or remediation.
- **Phase II – Confirmatory Sampling:** This phase confirms the presence or absence of suspected environmental contamination identified in Phase I by conducting confirmatory sampling of areas of concern.
- **Phase III – Characterization Sampling, Cleanup, and Decontamination:** This phase characterizes site contaminants, develops remedial approaches and cost estimates, and performs remediation of contaminated areas.

A Phase I EDDP shall be conducted for all real property that the EPA is considering acquiring. The Phase I EDDP shall include a thorough and detailed records review and site investigation. The site investigation includes general observations and an evaluation of the presence of underground and aboveground storage tanks, waste handling practices, radioactive materials, PCBs, asbestos, lead-based paint, pesticides, radon, and sensitive environmental areas. Phase II EDDP activities may be needed to properly characterize the environmental condition of the property. However, if a Phase II EDDP is needed, the EPA must evaluate its options on whether to move forward with the acquisition process or pursue other parcels of land. A Phase III EDDP is unlikely, since the EPA generally would not acquire property found to be contaminated unless it was prepared to pay for cleanup, or able to negotiate a reduced sale price adjusted for cleanup costs. Detailed procedures for Phase I, Phase II and Phase III can be found in the *Guidelines for Acquiring and Transferring EPA Real Property and Complying with the Community Environmental Response Facilitation Act (CERFA)*.

11.4 Reporting and Recordkeeping

EPA facilities are responsible for evaluating federal, state and local codes and regulations to identify all applicable reporting and recordkeeping requirements. These requirements vary based on factors such as the location, type of facility and equipment installed. Examples of reporting and recordkeeping requirements for EDDP that may apply to EPA facilities include:

- Phase I EDDP report
- Phase II/III project reports

Appendix A: Relevant Regulations

This appendix lists the regulations referenced in this Manual. For questions or inquiries, contact SOHSD@epa.gov.

- 10 CFR Part 20, Standards for Protection Against Radiation
- 29 CFR Part 1910, Occupational Safety and Health Act of 1970
- 29 CFR Part 1960, Basic Program Elements for Federal Employee Occupational Safety and Health Programs and Related Matters
- 40 CFR Part 6, Procedures for Implementing the Requirements of the Council on Environmental Quality on the National Environmental Policy Act
- 40 CFR Part 60, Standards of Performance for New Stationary Sources
- 40 CFR Part 61, National Emission Standards for Hazardous Air Pollutants
- 40 CFR Part 63, National Emission Standards for Hazardous Air Pollutants for Source Categories
- 40 CFR Part 82, Protection of Stratospheric Ozone
- 40 CFR Part 112, Oil Pollution Prevention
- 40 CFR Part 141, National Primary Drinking Water Regulations
- 40 CFR Part 142, National Primary Drinking Water Regulations Implementation
- 40 CFR Part 143, National Secondary Drinking Water Regulations
- 40 CFR Part 261, Identification and Listing of Hazardous Waste
- 40 CFR Part 262, Standards Applicable to Generators of Hazardous Waste
- 40 CFR Part 263, Standards Applicable to Transporters of Hazardous Waste
- 40 CFR Part 264, Standards for Owners and Operators of Hazardous Waste Treatment
- 40 CFR Part 265, Interim Status Standards for Owners and Operators of Hazardous Waste
- 40 CFR Part 266, Standards for the Management of Specific Hazardous Wastes and Specific Types of Hazardous Waste Management Facilities
- 40 CFR Part 268, Land Disposal Restrictions
- 40 CFR Part 270, EPA Administered Permit Programs: The Hazardous Waste Permit Program
- 40 CFR Part 273, Standards for Universal Waste Management
- 40 CFR Part 279, Standards for the Management of Used Oil
- 40 CFR Part 280, Technical Standards and Corrective Action Requirements for Owners and Operators of Underground Storage Tanks
- 40 CFR 403.5(b)(2), National Pretreatment Standards: Prohibited Discharges
- 40 CFR Part 761, Polychlorinated Biphenyls Manufacturing, Processing, Distribution in Commerce, and Use Prohibitions
- 40 CFR Parts 1500 to 1508, Council on Environmental Quality NEPA Implementing Regulations
- 41 CFR Part 102, Federal Management Regulations

Appendix B: State Environmental Contacts

State	State Agencies			
	Air Management	Hazardous Waste Management	Underground Storage Tanks	Water Management
Alabama	Air Division	Land Division	Land Division	Water Division
Alaska	Division of Air Quality	Solid Waste Program	Underground Storage Tanks	Division of Water
Arizona	Air Quality Division	Waste Programs Division	Underground Storage Tank Program	Water Quality Division
Arkansas	Office of Air Quality	Office of Land Resources	Office of Land Resources	Office of Water Quality
California	Air Resources Board	Department of Toxic Substances Control	State Waters Resources Control Board	State Waters Resources Control Board
Colorado	Department of Public Health & Environment	Department of Public Health & Environment	Division of Oil & Public Safety	Water Quality Control Division
Connecticut	Department of Energy and Environmental Protection	Department of Energy and Environmental Protection	Department of Energy and Environmental Protection	Department of Energy and Environmental Protection
Delaware	Division of Air Quality	Division of Waste and Hazardous Substances	Division of Waste and Hazardous Substances	Division of Water
District of Columbia	Department of Energy and Environment	Department of Energy and Environment	Department of Energy and Environment	Department of Energy and Environment
Florida	Department of Environmental Protection	Division of Waste Management	Division of Waste Management	Water Resource Management
Georgia	Air Protection Branch	Land Protection Branch	Land Protection Branch	Watershed Protection Branch
Hawaii	Clean Air Branch	Solid and Hazardous Waste Branch	Underground Storage Tanks Program	Water Resource Management
Idaho	Department of Environmental Quality	Department of Environmental Quality	Department of Environmental Quality	Department of Water Resources
Illinois	Environmental Protection Agency	Environmental Protection Agency	The Division of Petroleum & Chemical Safety	Environmental Protection Agency
Indiana	Department of Environmental Management	Department of Environmental Management	Department of Environmental Management	Department of Environmental Management
Iowa	Department of Natural Resources	Department of Natural Resources	Department of Natural Resources	Department of Natural Resources
Kansas	Division of Environment	Division of Environment	Division of Environment	Division of Environment
Kentucky	Energy and Environment Cabinet	Hazardous Waste Branch	Underground Storage Tank Branch	Division of Water

State	State Agencies			
	Air Management	Hazardous Waste Management	Underground Storage Tanks	Water Management
Louisiana	Department of Environmental Quality	Department of Environmental Quality	Underground Storage Tank Program	Department of Environmental Quality
Maine	Department of Environmental Protection	Department of Environmental Protection	Department of Environmental Protection	Department of Environmental Protection
Maryland	Department of the Environment	Department of the Environment	Oil Control Program	Department of the Environment
Massachusetts	Department of Environmental Protection	Department of Environmental Protection	Underground Storage Tank Program	Department of Environmental Protection
Michigan	Air Quality Division	Department of Environment, Great Lakes, and Energy	Storage Tank Division	Water Resources Division
Minnesota	Pollution Control Agency	Pollution Control Agency	Pollution Control Agency	Pollution Control Agency
Mississippi	Air Division	Waste Division	Underground Storage Tank Program	Department of Environmental Quality
Missouri	Department of Natural Resources	Department of Transportation	Department of Natural Resources	Department of Natural Resources
Montana	Department of Environmental Quality	Department of Environmental Quality	Department of Environmental Quality	Department of Environmental Quality
Nebraska	Department of Environment and Energy	Department of Environment and Energy	State Fire Marshall	Department of Environment and Energy
Nevada	Division of Environmental Protection	Division of Environmental Protection	Division of Environmental Protection	Division of Environmental Protection
New Hampshire	Department of Environmental Services	Department of Environmental Services	Department of Environmental Services	Department of Environmental Services
New Jersey	Division of Air Quality	Department of Environmental Protection Compliance & Enforcement	Site Remediation Program	Division of Water Supply and GeoScience
New Mexico	Air Quality Bureau	Hazardous Waste Regulation and Authorization	Petroleum Storage Tank Bureau	Environment Department
New York	Department of Environmental Conservation	Department of Environmental Conservation	Department of Environmental Conservation	Department of Environmental Conservation
North Carolina	Division of Air Quality	Division of Waste Management	Underground Storage Tank Section	Division of Water Resources
North Dakota	Division of Air Quality	Department of Environmental Quality	Department of Environmental Quality	Department of Water Resources

State	State Agencies			
	Air Management	Hazardous Waste Management	Underground Storage Tanks	Water Management
Ohio	Division of Air Pollution Control	Division of Environmental Response and Revitalization	Bureau of Underground Storage Tank Regulations	Division of Surface Water
Oklahoma	Air Quality Division	Land Protection Division	Petroleum Storage Tank Division	Water Resources Board
Oregon	Department of Environmental Quality	Department of Environmental Quality	Underground Storage Tank Program	Department of Environmental Quality
Pennsylvania	Bureau of Air Quality	Hazardous Waste Program	Department of Environmental Protection	Office of Water Programs
Puerto Rico	Department of Environment & Natural Resources	Department of Environment & Natural Resources	Department of Environment & Natural Resources	Department of Environment & Natural Resources
Rhode Island	Office of Air Resources	Waste Facilities Management Program	Underground Storage Tank Management Program	Water Resources Board
South Carolina	Air Quality	Land & Waste Management	Land & Waste Management	Bureau of Water
South Dakota	Air Quality Program	Agricultural & Environmental Services	Agricultural & Environmental Services	Office of Water
Tennessee	Division of Air Pollution Control	Department of Environment & Conservation	Department of Environment & Conservation	Division of Water Resources
Texas	Commission on Environmental Quality	Commission on Environmental Quality	Commission on Environmental Quality	Commission on Environmental Quality
Utah	Department of Environmental Quality	Department of Environmental Quality	Underground Storage Tank Branch	Department of Environmental Quality
Vermont	Air Quality and Climate Division	Waste Management and Prevention	Waste Management and Prevention	Watershed Management Division
Virginia	Department of Environmental Quality	Department of Environmental Quality	Department of Environmental Quality	Department of Environmental Quality
Washington	Department of Ecology	Department of Ecology	Department of Ecology	Department of Ecology
West Virginia	Division of Air Quality	Division of Water and Waste Management	Division of Water and Waste Management	Division of Water and Waste Management
Wisconsin	Department of Natural Resources	Department of Natural Resources	Department of Agriculture, Trade and Consumer Protection	Department of Natural Resources

State	State Agencies			
	Air Management	Hazardous Waste Management	Underground Storage Tanks	Water Management
Wyoming	Air Quality Division	Solid and Hazardous Waste Division	Solid and Hazardous Waste Division	Water Quality Division

Appendix C: Acronyms and Abbreviations

A&E	Architecture and Engineering
ACM	asbestos-containing materials
AHRI	Air-Conditioning, Heating, and Refrigeration Institute
ALARA	As Low As Reasonably Achievable
ANSI	American National Standards Institute
API	American Petroleum Institute
ASHRAE	American Society of Heating, Refrigerating and Air-Conditioning Engineers
ASME	American Society of Mechanical Engineers
AST	aboveground storage tank
BACT	best available control technology
Btu	British thermal units
CAA	Clean Air Act
CEQ	Council on Environmental Quality
CERFA	Community Environmental Response Facilitation Act
CFC	chlorofluorocarbon
CFR	Code of Federal Regulations
CWA	Clean Wate Act
CX	categorical exclusion
DOE	U.S. Department of Energy
DOT	U.S. Department of Transportation
EA	environmental assessment
EDDP	environmental due diligence process
EIS	environmental impact statement
EMS	environmental management system
EO	executive order
EPA	U.S. Environmental Protection Agency
EPCRA	Emergency Planning and Community Right-to-Know Act
EVSE	electric vehicle supply equipment
FAR	Federal Acquisition Regulation
FAST	Federal Automotive Statistical Tool
GHG	greenhouse gas
GSA	U.S. General Services Administration
HAP	hazardous air pollutant
HFC	hydrofluorocarbon
HVAC	heating, ventilation, and air-conditioning
IPM	Integrated pest management

ISO	International Organization for Standardization
kg	kilogram
LAER	lowest available emission rate
LQG	large quantity generator
MMBtu	Million Btu
mrem	millirem
MVAC	motor vehicle air conditioner
MW	megawatts
NEPA	National Environmental Policy Act
NESHAP	National Emissions Standards for Hazardous Air Pollutants
NFPA	National Fire Protection Association
NO_x	nitrogen oxides
NPDES	National Pollutant Discharge Elimination System
NRC	U.S. Nuclear Regulatory Commission
NSPS	new source performance standards
O&M	operations and maintenance
ODS	ozone-depleting substances
OMB	Office of Management and Budget
OTM	objectives, targets and metrics
PCB	polychlorinated biphenyl
pCi/L	picocuries per liter
PDCA	Plan-Do-Check-Act
PEI	Petroleum Equipment Institute
PM	particulate matter
POTW	publicly owned treatment works
ppm	parts per million
RACT	Reasonably Available Control Technology
RCRA	Resource Conservation and Recovery Act
RP	Recommended Practice
RPSD	Real Property Services Division
SDWA	Safe Drinking Water Act
SHEMP	Safety, Health and Environmental Management Program
SNAP	Significant New Alternatives Policy
SO_2	sulfur dioxide
SOHSD	Safety, Occupational Health and Sustainability Division
SPCC	spill prevention, control and countermeasure
SQG	small quantity generator
SWPPP	Stormwater Pollution Prevention Plan
TCLP	toxicity characteristic leaching procedure
UST	underground storage tank

VAM	vehicle allocation methodology
VOC	volatile organic compound
VSQG	very small quantity generator