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UCOR
United Cleanup Oak Ridge LLC

UCOR-4088/R4

Environmental Compliance Awareness Handbook, Oak Ridge, Tennessee

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This document is approved for public release per review by:

David Hamrin — 8/14/2025
UCOR Classification & Information Control Office — Date

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UCOR-4088/R4

Environmental Compliance Awareness Handbook, Oak Ridge, Tennessee

Date Issued—September 2025

Prepared for the
U.S. Department of Energy
Oak Ridge Office of Environmental Management

United Cleanup Oak Ridge LLC
under contract 89303322DEM000067

APPROVALS

Environmental Compliance Awareness Handbook, Oak Ridge, Tennessee	UCOR-4088/R4
	September 2025

USQD Review Determination	☐ USQD ☐ UCD ☐ CAT X ☐ Exempt (Select criteria 1–3 below.) USQD/UCD/CAT X No.: _____
Exemption Criteria	☐ (1) Non-intent change ☐ (2) DOE-approved safety basis document ☐ (3) Per criteria in PROC-NS-1001 (e.g., Project Integration and Business Services, Controller, Internal Audit, Labor Relations, General Counsel, Outreach & Public Affairs, Project Controls Services, and Human Resources provided they do not address any aspects of Fitness for Duty) OR ☒ (4) Document identified in USQD-MS-CX-REPORTS-1074
USQD Preparer:	Jamie Bailey Digitally signed by Jamie Bailey Date: 2025.08.14 07:52:34 -04'00' Name _____ Date _____
Exhibit L Mandatory Contractor Document	☒ No (No Proforma Change Control Director [PCCD] signature required.) ☐ Yes (Requires review by the PCCD.)
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Kevin Crow, Environmental Compliance Manager _____ Date _____
UCOR

Approved by: EMILY DAY (Affiliate) Digitally signed by EMILY DAY (Affiliate) Date: 2025.08.18 14:28:04 -04'00'

Emily Day, Environmental Compliance and Environmental Management System Program Manager _____ Date _____
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REVISION LOG

Revision number	Date	Description of changes	Sections or pages affected
0	December 2011	Initial issue of document.	All
1	June 2017	Updated program organizations and title changes	All
2	March 2021	Updated Safety Conscious Work Environment section, program organizations and title changes, added information on e-cigarette/vaping waste requirements.	All
3	June 2023	Updated Department Name and Universal Waste Information.	All
4	September 2025	Updated Environmental Management System (EMS) information. Removed DOE O 436.1, *Departmental Sustainability*, and climate change. Updated the Environmental Policy Statement.	All

CONTENTS

ACRONYMS

90-DAA	90-day accumulation area
ARAR	applicable or relevant and appropriate requirement
BMP	best management practice
CA	corrective action
CAA	central accumulation area
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act of 1980
CFR	*Code of Federal Regulations*
COR	City of Oak Ridge
DOE	U.S. Department of Energy
EC	environmental compliance
EMS	Environmental Management System
EPA	U.S. Environmental Protection Agency
ESWO	Emergency Services Watch Office
ETTP	East Tennessee Technology Park
FFA	Federal Facilities Agreement
HM	hazardous material(s)
HW	hazardous waste
ISMS	Integrated Safety Management System
LDR	Land Disposal Restriction
LLW	low-level waste
LSS	Laboratory Shift Superintendent
MLLW	mixed low-level waste
MW	mixed waste
NEPA	National Environmental Policy Act
NPDES	National Pollutant Discharge Elimination System
NPL	National Priorities List
NRC	U.S. Nuclear Regulatory Commission
OC	Operations Center
OREM	Oak Ridge Office of Environmental Management
ORNL	Oak Ridge National Laboratory
ORR	Oak Ridge Reservation
ORWMA	Oak Ridge Wildlife Management Area
OSHA	U.S. Occupational Safety and Health Administration
PCB	polychlorinated biphenyl
RCRA	Resource Conservation and Recovery Act of 1976
ROD	Record of Decision
RQ	reportable quantity
SAA	satellite accumulation area
SDS	Safety Data Sheet
SPCC	spill prevention, control, and countermeasures
TDEC	Tennessee Department of Environment and Conservation
TRU	transuranic
TSCA	Toxic Substances Control Act of 1976
TWRA	Tennessee Wildlife Resources Agency
UCOR	United Cleanup Oak Ridge LLC

UST	underground storage tank
UW	universal waste
WM	waste management
Y-12	Y-12 National Security Complex

1. PURPOSE

The purpose of this handbook is to provide UCOR employees and subcontractors working on the DOE Oak Ridge Reservation (ORR) with an overview of environmental and regulatory requirements applicable to site-specific environmental restoration activities. Brief summaries of hazards to the environment that can be expected on the jobsite and common physical controls for environmental protection are also provided.

Note: This handbook provides brief summaries of environmental resources, impacts, and controls to be applied to all work performed by UCOR employees and subcontractors. It is not meant to serve as or replace UCOR's or your company's EC program. Contact your EC Lead if you have questions or need assistance with environmental and regulatory issues or questions.

2. OUR SAFETY CULTURE

> *Safety is a prerequisite for all work being performed by UCOR and our subcontractors. We are committed to ensuring the safety of our employees and protection of the environment as we work to clean up the Oak Ridge Reservation. Our Integrated Safety Management System brings together environment, safety, and health into management and work practices at all levels. Employee involvement is a critical component of this system. We empower employees to stop work whenever they feel something is unsafe or unsure. We embrace a questioning attitude amongst our UCOR team members and encourage feedback and participation at all levels of the company. As we look toward the many upcoming tasks and challenges, safety will always be the foundation upon which we build our success—Every Task, Every Activity, Every Time.*
>
> —Ken Rueter, President and Chief Executive Officer, United Cleanup Oak Ridge LLC (UCOR)

UCOR always welcomes constructive feedback that will improve our EC Program. If you have a suggestion, discuss it with your supervisor or your EC Manager or EC Lead.

3. SAFETY CONSCIOUS WORK ENVIRONMENT

UCOR is committed to fostering and maintaining a safe work environment. UCOR and the U.S. Department of Energy (DOE) Oak Ridge Office of Environmental Management (OREM) are committed to maintaining a safety conscious work environment in all facilities and for all work. This is based on the following principles:

- Safety is a prerequisite for all work. Our expectation is that each employee goes home in the same condition in which they came to work. Our goal is zero injuries.

- All employees are encouraged and expected to promptly report all injuries, illnesses, and environmental incidents.
- All employees are encouraged and expected to understand the impact of personal choices and personal condition on being mission ready; and are expected to come to work each day prepared, ready, and able—physically, mentally, and emotionally—to complete their job tasks safely.
- All employees are encouraged and expected to have a questioning attitude and stop work if they feel a job cannot be done safely or if the environment is threatened.
- All members of the OREM/UCOR leadership team, up to and including the OREM Manager and the UCOR President and Chief Executive Officer, have an open-door policy, especially pertaining to safety.
- Employees have and are encouraged and expected to use multiple venues to express safety concerns, including but not limited to their management chain and the UCOR Employee Concerns Program.
- Employee involvement is the cornerstone of our safety culture and is essential to the successful implementation of the Integrated Safety Management System (ISMS), nuclear safety, the DOE Voluntary Protection Program, behavior-based safety, and other environmental, safety, health, and quality assurance program elements.

Employees are encouraged to raise safety issues and concerns without fear of reprisal. The OREM/UCOR leadership team will address and resolve issues and concerns in a timely manner.

4. OAK RIDGE RESERVATION SITE OVERVIEW

The DOE ORR encompasses 33,746 acres located within and adjacent to the corporate limits of the City of Oak Ridge (COR) in Anderson and Roane counties in East Tennessee. The ORR is bordered by developed portions of COR to the north and east, and the Clinch River to the south and west. Land use in the surrounding areas includes residential, commercial, and agricultural properties. Other than COR, property immediately adjacent to the ORR is primarily rural and undeveloped. Much of the ORR is also part of the Oak Ridge Wildlife Management Area (ORWMA).

The three primary DOE installations located within the ORR are the East Tennessee Technology Park (ETTP), Oak Ridge National Laboratory (ORNL), and Y-12 National Security Complex (Y-12). Operations at these facilities dating from the Manhattan Project in 1942 have resulted in contamination of the environment. As a result, the U.S. Environmental Protection Agency (EPA) placed the entire ORR on the National Priorities List (NPL) in 1989. These three facilities have different missions and expected end uses. ETTP has no continuing DOE mission and is being remediated to allow for its use as a commercial industrial park and the K-25 History Center, both without a significant DOE presence. ORNL is operated by the DOE Office of Science as a multidisciplinary research and development center. Y-12 is operated under the National Nuclear Security Administration to provide national defense operations.

The DOE Environmental Management Program is responsible for environmental restoration of contaminated sites within the ORR and its three installations. UCOR assumed responsibility as the environmental cleanup and remediation contractor for DOE on August 1, 2011.

5. ENVIRONMENTAL LAWS IMPACTING THE ORR AND ITS FACILITIES

Driving the environmental remediation program at the ORR and its facilities are several state and federal laws and regulations, as well as DOE directives and orders. The requirements generated from these laws, regulations, and directives are extensive and sometimes overlapping.

Restoration began in 1992, when DOE signed the first cleanup agreements with the EPA and the Tennessee Department of Environment and Conservation (TDEC). DOE was legally bound to investigate the ORR and take corrective actions (CAs) to clean up contamination and ensure the safe handling of waste. TDEC, its Division of DOE Oversight, and EPA Region 4 oversee cleanup at the ORR.

Cleanup work is based on agreements being performed in compliance with various regulations established to control hazardous, radioactive, and mixed wastes—from the time they are generated until their final disposal—in a manner that is protective of public health and the environment.

5.1 RESOURCE CONSERVATION AND RECOVERY ACT OF 1976

The Resource Conservation and Recovery Act of 1976 (RCRA) regulates the generation, accumulation, storage, transportation, and disposal of hazardous waste (HW). Waste is designated as hazardous by the EPA because of various chemical properties, including ignitability, corrosivity, reactivity, and toxicity. Certain waste must be rendered nonhazardous or treated to meet specific standards before it can be permanently disposed of in a landfill.

5.2 TOXIC SUBSTANCES CONTROL ACT OF 1976

The Toxic Substances Control Act of 1976 (TSCA) regulates the use, storage, and disposal of polychlorinated biphenyls (PCBs). The electrical power systems at many ORR facilities that are in the process of being dismantled used oil-based circuit breaker transformers and large high-voltage capacitors, both containing PCB oil, to supply electricity for past enrichment process activities. PCBs were also used in paints, and PCB-contaminated paint has been identified on numerous structures at the ORR.

In addition to TSCA and its enabling regulations, ORR facilities operate in compliance with the Oak Ridge Reservation Polychlorinated Biphenyl Federal Facilities Compliance Agreement between EPA Region 4 and DOE Oak Ridge Operations, effective December 16, 1996.

5.3 COMPREHENSIVE ENVIRONMENTAL RESPONSE, COMPENSATION, AND LIABILITY ACT OF 1980

ORR is included on the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) NPL of sites requiring cleanup. Under the provisions of CERCLA and its decision documents (e.g., Records of Decision [RODs]), DOE is obligated to comply with those federal, state, and local requirements that are deemed applicable or relevant and appropriate requirements (ARARs). Although many administrative requirements (e.g., written records, permits) are waived under CERCLA, all substantive requirements (e.g., engineering controls) that provide protection of the environment or that meet permitting standards still apply and must be complied with to meet the intent of the enabling federal laws that are the basis for the regulations.

Section 103 of CERCLA requires notification to the EPA National Response Center if hazardous substances are released to the environment in amounts greater than or equal to the reportable quantity (RQ) listed for each hazardous substance. RQs are listed in the act and EPA regulations and vary depending on the type of hazardous substance and volume released.

5.4 FEDERAL FACILITY COMPLIANCE ACT

All three facilities at the ORR currently manage a mixture of RCRA HW, low-level radioactive waste, and mixed waste (MW) consisting of RCRA waste and radioactivity. RCRA HW is subject to Land Disposal Restrictions (LDRs) in federal regulations that do not allow the storage of HW for longer than 1 yr if there is an EPA-approved technology to treat the waste. The Federal Facility Compliance Act, enacted by Congress in October 1992, allows for the storage of mixed hazardous/low-level radioactive waste for longer than 1 yr if treatment is not readily available for these types of waste.

5.5 NATIONAL ENVIRONMENTAL POLICY ACT

This act requires that all federal agencies anticipate and consider environmental consequences prior to undertaking major actions. DOE is required to evaluate and prepare a statement on the environmental impact of every proposal for federal action “significantly affecting the quality of the human environment.”

National Environmental Policy Act (NEPA) created an environmental impact review process that includes public review and participation. This process includes an environmental assessment to determine whether a proposed action would have significant impact to the environment and an environmental impact statement that summarizes all impacts to the environment and their consequences. NEPA values are also addressed in all CERCLA evaluations conducted for remedial activities on the ORR.

5.6 NATIONAL HISTORIC PRESERVATION ACT AND ARCHAEOLOGICAL RESOURCES PROTECTION ACT

The intent of these acts is to preserve the historical and cultural foundations of the nation as a living part of our community life and development in order to give a sense of orientation to the American people. DOE is required to prepare and implement a cultural resources management plan that documents and protects historical, cultural, and archaeological resources (including artifacts, human remains, etc.) for future generations.

5.7 SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT (SARA TITLE III)

This law also includes provisions of the Emergency Planning and Community Right-to-Know Act. Its two-fold purpose is to develop plans to respond quickly in the event of an accident, spill, or release of hazardous substances, and to increase the public's knowledge and access to information on the presence of hazardous chemicals in their communities, and releases of these chemicals into the environment.

5.8 CLEAN WATER ACT

This act forms the basis for efforts to control pollution of our nation's surface waters. The law's goal is to make all surface waters safe for fishing and swimming.

5.9 CLEAN AIR ACT

The Clean Air Act of 1970 and 1977 and the Act's 1990 amendments gave the federal government power to control air pollution. Clean air laws require EPA to establish national ambient air quality standards for major outdoor pollutants—particulates, sulfur oxides, carbon monoxide, nitrogen oxides, ozone, and lead. Each standard specifies the maximum allowable level, averaged over a specific time period, for a certain pollutant in outdoor air. The EPA has designated a list of hazardous air pollutants and established national emission standards for hazardous air pollutants to control radionuclide and radon emissions from DOE facilities.

5.10 FEDERAL INSECTICIDE, FUNGICIDE, AND RODENTICIDE ACT

This act controls any substance or mixture of substances intended for preventing, destroying, repelling, or mitigating any pest, use as a plant regulator, defoliant, or desiccant, or use as a nitrogen stabilizer. Personnel at all three facilities on the ORR may apply general-use pesticides according to product labeling, and all product warnings and cautions must be strictly obeyed. When application of a restricted-use pesticide is required, a certified contractor must be employed before the pesticide is applied.

5.11 ENVIRONMENTAL PROTECTION

DOE Policy 450.4A, *Integrated Safety Management Policy*, which references DOE Order 450.2, *Integrated Safety Management*, support establishment of environmental management system (EMS) programs. The UCOR EMS and other programs serve to effectively and efficiently implement the provisions of DOE Guide 450.4-1C, *Integrated Safety Management System Guide*, and 48 *Code of Federal Regulations* (*CFR*) Sect. 970.5223-1, "Integration of environment, safety, and health into work planning and execution" (Department of Energy Acquisition Regulation [DEAR] Integrated Safety Management [ISM] clause). The primary elements of the EMS include a written environmental policy, subject matter expertise, approved and documented procedures, and a CA program that addresses EC.

6. REGULATORY AGREEMENTS

6.1 FEDERAL FACILITIES AGREEMENT

EPA proposed the ORR for listing on the NPL in July 1989, with the final listing effective in December 1989. As a result of this, DOE, EPA Region 4, and TDEC signed DOE/OR-1014, *Federal Facilities Agreement*, for the restoration of the ORR, effective in January 1992. The FFA has been amended several times since then by agreement of the signing parties.

The FFA defines various federal environmental laws that apply to remedial efforts. It also establishes a procedural framework and schedule for developing, implementing, and monitoring response actions at the ORR in accordance with CERCLA, RCRA, NEPA, and Tennessee laws. The FFA requires that a list of ARARs be prepared as required by CERCLA. ARARs are normally written into the CERCLA decision documents. The FFA coordinates between CERCLA and RCRA, stating that CAs previously established under DOE's current Hazardous and Solid Waste Amendments of 1984 CAs document will be supplemented with response actions under CERCLA to ensure comprehensive remediation at the ORR. Existing RCRA-permitted facilities will be modified to incorporate a CERCLA remedial response selected as a corrective measure to satisfy RCRA. Specifically, the FFA extends to preparation of key decision documents under CERCLA and RCRA, called RODs.

6.2 CERCLA RECORDS OF DECISION

The following list contains some of the sites for which RODs have been approved and issued to direct cleanup work on the ORR. Additional RODs will be written and approved as new cleanup actions are planned, scheduled, and implemented.

- K-1407-B/-C Ponds (1993)
- Upper East Fork Poplar Creek Operable Unit 2 (1994)

- Oak Ridge Associated Universities South Campus Facility, Kerr Hollow Quarry, Lower East Fork Poplar Creek, and Lower Watts Bar Reservoir (1995)
- Chestnut Ridge Operable Unit 2 (1996)
- Removal of sludge from tanks at ORNL; and remediation of the Surface Impoundments at ORNL, Clinch River/Poplar Creek, Bear Creek Operable Unit 2, and Union Valley groundwater plumes (1997)
- Molten Salt Reactor Experiment fuel and flush salts, K-1070-C/D Operable Units (1998)
- K-1070-A Burial Ground and Bear Creek Valley (2000)
- Melton Valley Watershed and Bear Creek Valley Watershed (2000 and 2004, respectively)
- Bethel Valley Watershed and Upper East Fork Poplar Creek sediments (2002)
- ETTP Zone 1 soil remediation (2002)
- Zone 2 Soil, Buried Waste, and Subsurface Structure removal (2005)
- Upper East Fork Poplar Creek Characterization Area (2006)

7. ENVIRONMENTAL MANAGEMENT SYSTEM

7.1 ENVIRONMENTAL POLICY STATEMENT

UCOR is committed to incorporating sound environmental management, protection, and stewardship considerations in all its business decisions, work processes, and activities that are part of our DOE contract. The environmental policy provides a framework for setting environmental objectives and includes a commitment to continually improve the environmental performance of our operations. Our commitment to protect and sustain human, natural, and cultural resources is inherent in our mission to complete environmental cleanup safely with reduced risks to the public, workers, and the environment.

UCOR implements an EMS as part of its existing ISMS. Using a graded approach appropriate for a closure and remediation contract, the EMS incorporates performance goals and provides a unified strategy for the management and protection of natural resources, the control and attenuation of risks, the prevention of pollution, the acquisition of environmentally preferable products and services, and the establishment and attainment of all environmental, safety and health requirements. UCOR works continuously to improve our EMS and environmental performance and to communicate and reinforce this policy to our internal and external stakeholders.

Taking into account environmental considerations during all phases of work is important. UCOR ISMS provides a framework for doing work safely when we apply its five core functions and eight guiding principles. Environmental aspects—a site's natural resources, how our work affects them, and how impacts on our environment can be controlled or

eliminated—are all evaluated by applying an EMS approach to the ISMS process. Listed below are UCOR's environmental aspects associated with our work activities:

- Air emissions
- Aquatic resource alteration
- Cultural/historic preservation
- Energy/fuel use
- Environmental noise
- Land use changes
- Pollution prevention/waste minimization
- Releases to the facilities/land/soil/surface water
- Releases to or pumping of groundwater
- Sanitary wastewater discharges
- Stormwater discharges
- Waste generation
- Wastewater discharges
- Water use
- Wildlife/habitat/endangered species

7.2 YOUR ROLE IN ENVIRONMENTAL COMPLIANCE

You help make the EMS work when you consider the environment during each phase of your job planning, scoping, and execution and discuss your ideas with your supervisor and your team as work proceeds and after the job is done.

Thinking about environmental compliance means asking the following questions:

1. Have we discussed the scope of work to be performed today?
2. Have we considered the site's natural resources and their significance?
3. Have we identified the hazards and potential impacts that may affect the site's environment as well as our own safety?
4. Are we trained to apply the appropriate environmental requirements or permit conditions? Are we complying with the requirements that apply?
5. What conditions could change today that might affect the site's environment?
6. Do we know what to do or whom to contact if there is a spill, release, or other change?
7. How can we ensure that what we do and how we do it will protect the site environment?

With UCOR environmental policy in mind, you can turn to the specific job-related environmental requirements that ensure compliance and promote best practices in daily operations.

8. JOB-SPECIFIC ENVIRONMENTAL REQUIREMENTS

8.1 GENERAL

This section provides general summary-level information on various job-specific environmental requirements; however, it is not intended to be an all-inclusive list of environmental aspects and controls. More specific guidance and requirements can be found in PPD-EC-1747, *Environmental Compliance Program*, and other UCOR EC and EMS implementing documents. In addition, the EC Lead and/or EC Manager should be consulted for guidance on job-specific environmental requirements as necessary.

8.2 AIR

8.2.1 Sources of Air Pollution That May Require Permits

Permits, physical controls, or evaluations normally required for air emission limits may apply to the following:

- Fuel storage/transfer tanks
- Construction projects
- Excavation and penetration activities
- Scabbling and paint removal activities
- Painting spray booths
- Solvent cleaning operations
- Carpenter shops
- Emergency diesel generators
- Glove boxes
- Maintenance of refrigeration equipment
- Landfill vents
- Groundwater treatment facilities
- Radioactive emission point sources (e.g., portable high-efficiency particulate air filters)

Remember—Permits, controls, or evaluations may be required before construction or operations begin.

These permits limit some or all of the following:

- Particulate and gaseous emissions (from stacks, ducts, and filters)
- Fugitive emissions (emissions from sources other than stacks or ducts, such as gasoline, chemical tanks or airborne dust and particulate matter)
- Opacity (pollutants from building vents or stacks and fugitive emissions)
- Volatile organic compounds (fuel storage tanks and chemical treatment tanks)

Control equipment must be maintained in good condition and operated as permitted.

8.2.2 What Can I Do?

- Apply water for control of airborne dust, such as on gravel roads and open areas where earthmoving operations are in progress. Cover sources of dust where practical.

  Note: Potable tap water usually contains chlorine and should not be used for dust control. Chlorine in runoff water can kill fish and wildlife and may violate certain water permits.
- Do not conduct open burning unless you have checked with your site EC Lead and notified the Emergency Services Watch Office (ESWO), Y-12 Operations Center (OC), or ORNL Laboratory Shift Superintendent (LSS), according to your location. In certain cases, notification to COR and TDEC are required prior to conducting open burning. Also, in certain county jurisdictions (e.g., Roane County), a burn permit is required before conducting an open burn. Never burn tires, rubber, batteries, plastics, or treated wood.
- Remember—Check to see if a permit is required before you build it, operate it, or change it.

8.3 STORMWATER

National Pollutant Discharge Elimination System (NPDES) permits are issued by TDEC and set limits for discharges of pollutants into waters of the State of Tennessee (e.g., surface water, groundwater, wetlands). These permits regulate discharges of stormwater, treated wastewater, groundwater, etc., into the waters of the state.

8.3.1 Stormwater Runoff

Stormwater runoff is generated from rain and snowmelt events that flow over land or impervious surfaces, such as paved streets, parking lots, and building rooftops, and does not soak into the ground. The runoff picks up pollutants like trash, chemicals, oils, and dirt/sediment that can harm rivers, streams, lakes, and wetlands. Stormwater runoff regulations and site runoff controls are designed to prevent pollutants from washing into surface water during precipitation events.

General plant areas, parking lots, and equipment are sources of stormwater runoff contamination. Other potential sources of contamination in stormwater include the following:

- Chemical or material transfer and storage including any associated leaks
- Improper discharge of accumulated water from ditches, trenches, excavations, etc.
- Vehicle and heavy equipment maintenance areas
- Leaking equipment in switchyards or transformer yards
- Fluid leaks from vehicles and equipment
- Overfilling of fuel tanks on personal or site vehicles, especially during hot weather
- Poor housekeeping
- Leaking storage tanks, drums, or containers
- Improper pesticide application
- Erosion from areas of exposed soil

Discharges of pollutants in stormwater runoff can be controlled using best management practices (BMPs). BMPs are utilized to reduce pollutants and/or prevent pollution by controlling it at its source. BMPs have been prepared for many common activities that could contribute pollutants to surface water via stormwater runoff. Check with your site EC staff for further assistance about what requirements apply to your site or work area and what BMPs are available that cover your work activities.

8.3.2 What Can I Do?

- Do not discharge or dispose of anything in a stormwater inlet under any circumstances. These inlets are connected to the main stormwater drainage system, which ultimately discharges to waters of the state. In addition to creating a potential noncompliance with your site's NPDES stormwater permit, illicit discharges to the storm drain system could cause major impact to the plants and animals that inhabit receiving waters.
- Immediately report any leaks or spills you observe to your supervisor or directly to ESWO, the OC, or the LSS.
- Inspect your personal vehicle and any vehicles you may operate onsite on a routine basis to ensure that they are not leaking fuel, oil, coolant, or other fluids.

8.4 DRINKING WATER

The installations on the ORR either have their own water treatment facilities that supply drinking water onsite or are supplied municipal water. ETTP and Y-12 receive drinking water from facilities operated by COR. UCOR does not operate any water potable treatment facilities on the ORR.

Drinking water must meet special permit limits set on chlorine, turbidity, metals, organic compounds, and bacterial content.

Whenever drinking water lines are extended or new lines are installed, the lines must be disinfected, and the water tested to demonstrate that bacteria are not present before the lines

can be placed into service. Backflow preventers are also required within ORR facilities to prevent contamination of drinking water by process water.

8.4.1 What Can I Do?

- Do not discharge drinking water to the environment or to the storm drain system. The chlorine used to kill bacteria in drinking water can kill aquatic organisms at very low concentrations.
- Report immediately any unusual water discharges from the ground or through cracks in sidewalks or roadways. Seeping water may indicate a ruptured water line.

8.5 SANITARY SEWER SYSTEMS

Sewage is waste matter or refuse liquid carried by water. It consists mostly of greywater (from sinks, showers, dishwashers, and clothes washers), blackwater (the water used to flush toilets, combined with the human waste that it flushes away), soaps and detergents, and toilet paper. Facilities on the ORR have their own sewage treatment plants operated by a DOE prime contractor or are provided sewage treatment services by COR.

Overflow is a discharge of a waste stream from a collection or treatment system other than through the permitted discharge point.

Examples of overflow include release due to leaking or ruptured pipe and release due to blockage of a pipe by an obstruction.

8.5.1 What Can I Do?

- Report any seepage, leaks, or overflows of sanitary sewage piping systems and associated tanks to your supervisor; to ESWO, the OC, the LSS, as appropriate; or the project's EC staff.
- Ask before you repair, reroute, or perform maintenance work for any sewage-handling equipment, piping, and associated tanks.
- Do not pour any chemical, used oil, or other hazardous liquid down any drain that could inhibit the bacterial action responsible for sewage treatment or have negative effects on the ORR sewage treatment systems. Dispose of chemicals properly. If you do not know what to do, ask your supervisor or EC Lead.
- Do not flush paper towels, sanitary products, or other materials that may create blockages in sanitary sewer system piping.

8.6 SEDIMENT/EROSION CONTROL

Disturbed areas (e.g., land areas subject to excavation, penetration) or construction activities that disturb greater than 1 acre may require a stormwater permit and a stormwater pollution prevention plan before work can begin.

8.6.1 What Can I Do?

Work with your EC Lead or your company's EC staff before beginning clearing, excavating, or construction activities to determine permit requirements and to apply for and obtain a permit if one is required.

Disturbed soil, if not managed properly, can be carried offsite during precipitation events. Unless proper erosion prevention and sediment controls are used for construction activities, transport of sediment to a local water body is possible. Excessive sedimentation causes adverse impacts due to biological alterations, reduced passage in rivers and streams, higher drinking water treatment costs for removing the sediment, and the alteration of water's physical and chemical properties, resulting in degradation of its quality.

The amount of sediment carried in stormwater runoff can be minimized by using the following BMPs:

- Stormwater can be diverted away from areas of soil disturbance to reduce contact (e.g.. using diversion ditch or dike up-gradient of a construction area).
- Construction projects can be planned in stages to minimize areas of soil exposed at any one time.
- Terraced or benched slopes and roughening or graded slopes will slow and reduce runoff.
- Disturbed areas should be revegetated as soon as possible after work has been completed.
- Vegetation can provide sediment control when used as a filter to collect sediment (e.g., strips of grass along the contour of a graded slope or planted in the area preceding a storm drain).
- Silt fences, absorbent socks, or sandbags can be used to trap sediment in areas of exposed soil. These devices must be installed so that water does not flow under or around them. They must also be checked routinely (particularly after heavy rains) and repaired or replaced as necessary.
- Sediment basins or retention ponds may be used to collect runoff that has high levels of suspended solids or other pollutants, such as from a large construction project.

8.7 GROUNDWATER

Groundwater is widely used as a source of drinking water, so groundwater quality must be protected. Although groundwater beneath the ORR is not used as a drinking water supply, it does provide a source of recharge water to certain surface water environments like streams, lakes, and wetland areas.

Common sources of groundwater contamination include the following:

- Leachate from landfills
- Leaking underground storage tanks (USTs) and leaking underground pipes/lines

- Improper use of pesticides
- Cleaning and degreasing operations
- Overfills or spills when filling tanks or refueling equipment
- Pipeline or equipment ruptures

8.7.1 What Can I Do?

- Properly dispose of all waste; do not dispose of chemicals down storm drains, floor drains, or on the ground.
- Safely use and store all chemicals and fuels.
- Minimize the use of chemicals; always use according to directions.
- Make sure waste dumpsters are closed.
- Do not overfill vehicle fuel tanks, especially in hot weather.

8.8 RELEASES TO THE ENVIRONMENT

Releases of liquids, solids, or gases to the air, water, and soil can have immediate and long-term effects on the environment as well as on our personal safety and the public health.

8.8.1 What Can I Do?

There are actions that you can take to help prevent spills, leaks, emissions, discharges, and other releases to the environment and control or minimize their damage when they occur.

8.8.1.1 Spill prevention

Each plant site on the ORR has a spill prevention, control, and countermeasure (SPCC) plan and contingency plan for preventing oil or hazardous substances from reaching surface waters and responding to a spill:

- READ your plan so you are familiar with it.

Storage tanks (e.g., fuel oil, gasoline, acids, caustics, drums of chemicals) may create opportunities for spills:

- Fuel truck transfer operations and oil storage containers (e.g., fuel oil, diesel, gasoline, hydraulic fluids) with a capacity of 55 gal or greater must have secondary containment.
- SPCC-regulated aboveground storage tanks must meet specifically sized secondary containment requirements.
- Keep valves on secondary containment areas closed.
- Use oil absorbents for spills.
- Inspect tanks, pipes, and valves for leaks.

- Petroleum USTs must meet regulatory requirements for USTs, which may include SPCC requirements.
- Maintain your spill kit by periodically, checking its inventory to ensure it is stocked for use.
- Be alert—Do not overfill a storage tank, gasoline can, container, or a vehicle or equipment fuel tank.

8.8.1.2 Spill control

All facilities at the ORR should use documented and approved practices to prevent spills. If a spill of oil, hydraulic fluid, antifreeze, material, product, or hazardous or radioactive substances occurs, immediately notify your supervisor; ESWO, the OC, or the LSS; and your site or company EC staff.

Note 1: Under no circumstances shall the spilled material be intentionally washed into nearby drainage ditches, storm sewers, sanitary sewers, wetlands, or waterways.

Note 2: Your site or work area may have criteria that help determine the need to notify based on the size of the spill, the material involved, or whether the spill is easily contained and cleaned up. Check with UCOR's or your company's EC staff to be sure.

To control a spill:

- Identify the material spilled and the approximate quantity. Can the spill reach surface waters? A storm drain?
- If safe to do so, stop the source of the release and its spread if possible.
- If safe to do so, contain the spill within a diked area if possible. Block possible pathways for the spill to reach surface waters or to contaminate a larger area.
- If safe to do so, clean up the spill using absorbents or other appropriate response materials.
- Dispose of all cleanup residue (wipes, pads, tools, etc.) properly.

Contact the UCOR Waste Management (WM) organization or your company's WM staff for further information.

Soil contaminated from the spill may need to be removed or treated in accordance with regulations (the transport and/or treatment of contaminated soil may require permitting or regulatory approval).

To control a spill of hazardous or radioactive substances:

- The ETTP, ORNL, and Y-12 Fire Departments have primary responsibility for the initial response to the most hazardous and radioactive spills that the operating project or organization cannot control. Proper training is required prior to handling hazardous and radioactive material spills.

8.8.1.3 Spill notification

Any spill that releases more than EPA's defined RQ to the environment must be reported to the EPA National Response Center in Washington, D.C., and the appropriate Tennessee and local authorities.

In Tennessee, any amount of oil that causes oil sheen on a water surface of a creek, stream, tributary, river, pond, or lake is also a reportable spill.

Some hazardous materials (HM), such as asbestos or PCBs, must be reported if the amount spilled to the environment is as low as 1 lb.

Contact your EC Lead to determine if spills and releases are reportable. In addition, immediately contact your supervisor; and ESWO, the OC, or the LSS, as appropriate. Finally, follow UCOR's or your project site's occurrence reporting procedures or the DOE Occurrence Reporting and Processing System process.

8.8.1.4 Spill response

Note: When responding to spills, releases, and other emergencies involving an uncontrolled release of hazardous or radioactive materials, consider your safety and that of your team first! Keep distance between yourself and your coworkers and the spill to provide a margin of safety.

Specialized response training is required for all workers and their supervisors who handle HW; radioactive materials; and certain other liquids, solids, or gases. If you are not trained to respond to a given type of spill or release, immediately contact ESWO, the OC, or the LSS, as appropriate, so trained personnel can respond in a timely manner.

8.9 POLLUTION PREVENTION/WASTE MINIMIZATION

There are many things each of us can do to prevent pollution and to minimize the amount of waste we create on the jobsite.

- Recycling paper, aluminum cans, used oil, plastic, alkaline batteries and other disposable items (e.g., photocopier toner cartridges) can help to reduce waste that needs to be landfilled and helps to stop pollution of the environment.
- Watch for special containers at your jobsite that are used to collect various recyclable materials. Recycle when you can.
- Ask your office administrator about how you can recycle paper or other office supplies (e.g., photocopier machine toner cartridges).

- When procuring goods under government contract, buy building materials, office supplies, and other goods that are made from recycled or biobased material. For example, office paper should be manufactured from recycled paper. Examples of biobased materials include products made from renewable natural resources such as products made from agricultural products (e.g., citric-based cleaning products). Contact the UCOR Pollution Prevention Coordinator for assistance in identifying environmentally preferable products and materials.
- Discuss your ideas for preventing pollution and minimizing all types of waste with your supervisor and work team.

9. WASTE TYPES AND THEIR MANAGEMENT

9.1 GENERAL

Many types of waste are generated during execution of UCOR work scope and it is very important that the type of waste generated, and the associated waste storage and handling requirements be identified prior to generating the waste. This section contains summary level information on the various types of waste and the associated handling requirements. Additional information can be found in PPD-EC-1747. In addition, the EC Lead and project WM staff should be contacted to determine proper waste handling requirements when necessary.

9.2 SANITARY WASTE

Sanitary or solid waste is commonly considered household trash, garbage, or clean, uncontaminated industrial waste. Such waste generated at the jobsite must be properly disposed.

The following uncontaminated construction and industrial waste is also considered sanitary or solid waste:

- Bricks
- Concrete
- Masonry
- Fiberglass
- Glass
- Rubber
- Plastic
- Non-asbestos insulation
- Empty crushed paint cans
- Used paint brushes

- Soil
- Rocks
- Paving materials
- Scrap metal
- Duct work
- Piping
- Filters
- Treated wood
- Rubbish—Similar to household waste; non-oily rags, nonrecyclable paper

To help prevent pollution and minimize waste, collect the following types of solid waste separately for recycling or reuse (in designated, properly labeled containers):

- Office paper
- Cardboard packaging
- Aluminum cans
- Used oil
- Light bulbs (e.g., fluorescent, sodium, halogen)
- Plastic bottles
- Batteries

Check with your project's or company's WM staff if you have any questions about proper management, transportation, and disposal of sanitary or solid waste.

9.3 HAZARDOUS WASTE, RADIOACTIVE WASTE, MIXED WASTE, AND SPECIAL WASTE

An HW is a waste with properties that make it dangerous or capable of having a harmful effect on human health or the environment. HW is regulated by TDEC and EPA.

Radioactive waste is radioactive material with little potential for recycle and is therefore destined for disposal. Radioactive waste is regulated by DOE.

MW is an HW which also contains radioactive material. MW is regulated by DOE, TDEC, and EPA.

Special waste (such as oily rags, used oil absorbent materials, empty HM containers, materials containing bulk PCBs or asbestos, sandblasting grit, and industrial filters) is a solid waste that is either difficult or dangerous to manage. Special wastes are regulated by TDEC.

9.4 HAZARDOUS MATERIALS

An HM is any material (e.g., liquid, solid, or gas) that is capable of producing adverse effects to human health, to the safety of those using it, and to the environment where it is used. The use of HM in the workplace is regulated by the Occupational Safety and Health Administration (OSHA). The transport of HM and HW, MW, and radioactive waste is regulated by the U.S. Department of Transportation (DOT).

9.5 HAZARD COMMUNICATION

HM is a necessary part of most ORR operations, but it can be handled to minimize risk to health, safety, and the environment. You have a legal right to know about any hazards involved with chemicals used on the job.

Know what is on the warning label and the Safety Data Sheet (SDS). The label on each container will provide valuable information on potential hazards, safe handling, and proper storage.

- The label provides information on the container's contents.
- An SDS is provided by the manufacturer for every chemical used.
- The SDS contains information on any hazards and any special handling requirements.
- The SDS must be available to you for your review at the work site.
- Follow all safety, storage, handling, use, and disposal instructions.
- Use the correct product or chemical for the job and the minimum amount of product or chemical necessary. If possible, use a nonhazardous substitute.

The OSHA 2012 Hazard Communication Standard requires employee training on HM in the workplace, including how to read an SDS.

9.6 COMMON HAZARDOUS MATERIALS FOUND OR USED AT FACILITIES ON THE ORR

Asbestos may be present in ceiling tiles, transite siding, roofing, flooring, insulation, cable trays, wire, piping, boiler turbines, and feedwater heater insulation.

Mercury may be present in some electrical switches and gauges, as well as in thermometers and thermostats.

Compressed gas is usually stored in metal cylinders. One of the most common types of compressed gases is aerosol cans. Spent or unwanted aerosol cans should never be thrown into the dumpster or sanitary trash bin. They must be depressurized and drained before recycling, and liquids must be managed as HW and shipped offsite for proper treatment and disposal (e.g., incineration).

Toxic, reactive, corrosive, or ignitable reagents Yes be stored in approved safety containers or storage cabinets.

Air conditioning and heating systems, diesel generators, and water treatment processes may contain hazardous liquids, such as the following:

- Sulfuric acid
- Ethylene glycol (antifreeze)
- Sodium hydroxide
- Chlorofluorocarbon refrigerant
- Natural gas
- Sodium permanganate
- Sodium nitrate
- Citric acid
- Nitric acid (corrosive, oxidizer)
- Diesel fuel
- Gasoline

9.6.1 E-Cigarettes/Vapes

Electronic cigarettes (e-cigarettes) and vaping products have become widely used in recent years. Nicotine, a chemical found in tobacco, is commonly used in e-cigarettes and vaping products. When generated in the workplace, e-cigarettes and vaping products containing nicotine (even if used and empty) are regulated for disposal as an acute HW. Examples include:

- Waste e-liquids/e-juice in e-cigarettes
- Waste cartridges
- Waste vials

To ensure these items are properly managed, do not place any e-cigarette or vaping wastes in the sanitary trash, recycle containers, or outdoor ashtrays/cigarette butt receptacles at work. Do either of the following:

- Dispose of at home. Consumers can dispose of e-cigarette and vaping products at home as they are considered exempt household HW and not subject to regulation.
- Recycle from home by locating manufacturers and retailers that will accept the items.

9.6.2 What Can I Do to Handle Hazardous Materials Properly?

- Wear appropriate safety equipment as defined in the Job Hazard Analysis for your task.

Remember—You must be medically qualified, trained, and fit tested prior to using a respirator or dust mask.

- Make sure your work area is safe for handling HM. Safe conditions are a result of the following:
  - — Good ventilation
  - — Clean workspace where good housekeeping practices are obvious
  - — Appropriate temperature and away from direct heat
  - — Readily available spill response equipment
  - — Compliance with fire safety rules
- Use the contents of previously opened containers prior to opening a new one. Take out of storage only the amount you need to do the job.
- When transferring chemicals from bulk containers (drums) to smaller containers (buckets), the smaller container must be compatible with the chemical used and must be properly labeled to identify the chemical.
- Return unused and uncontaminated chemicals to a designated storage area when the job is completed.
- Close/seal all chemical containers when they are not in use.
- Do not pour used or excess chemicals down a drain, into a sump or pond, or onto the ground.
- Check with your project's WM staff for proper disposal of waste and containers (e.g., plastic bottles, used spray paint cans).

9.7 PESTICIDES AND THEIR APPLICATION

A pesticide is any substance or mixture of substances intended for:

- Preventing, destroying, repelling or mitigating any pest
- Use as a plant regulator, defoliant, or desiccant
- Use as a nitrogen stabilizer

Pesticides are classified as nonrestricted use or restricted use. Nonrestricted-use pesticides are generally in ready to use form and are approved for use by noncertified applicators. Restricted-use pesticides are used only when nothing else works to control the pest. Such pesticides can be used only by state-certified applicators. ORR facility personnel may use contractors to apply restricted-use pesticides. Waste generated from using such pesticides may require disposal as HW.

- Use appropriate personal protective equipment for the job: safety glasses, respirator, protective clothing, gloves, and boots.
- Read and follow all label directions—the label is the law.

- Improper application of pesticides can contaminate surface water or groundwater.
- Remember—Keep pesticide use and waste to a minimum.

9.8 MANAGEMENT OF SOLID AND HAZARDOUS WASTE

Waste is managed by storage, treatment, recycling/reuse, or disposal. A material that is ready for disposal is considered a solid waste. A solid waste may be a liquid, solid, or gas. Disposal practices must follow federal, state, and local solid waste laws.

Generators of waste at ORR facilities are responsible for determining if the waste is hazardous. If help is needed with this determination, contact your project's or company's WM staff.

HW is tracked and managed during its storage, treatment, recycling, and disposal, from "cradle to grave" (from its point of generation to disposal). Such waste must be labeled and managed in accordance with EPA and TDEC rules.

To properly dispose of waste, you must know whether it is hazardous or nonhazardous.

A waste is hazardous if it contains an EPA-listed HW or if it exhibits one or more of any hazardous characteristic(s) (ignitable, corrosive, reactive, or toxic).

HW or HW residues from treatment processes must be permanently disposed of at an EPA/state-permitted disposal facility.

A nonhazardous/non-radiological waste can be disposed of at a state-permitted landfill. On the ORR, most of this type of waste is disposed of at the Y-12 Sanitary Landfills.

Do not mix hazardous and nonhazardous waste. If an EPA-listed HW is purposely or accidentally mixed with nonhazardous waste, the entire waste volume must be disposed as required for the listed waste.

If you are unsure about whether a waste is hazardous, then you must manage the waste as if it were hazardous in the interim. Check with your project or company WM staff.

9.9 CHARACTERISTICS OF HAZARDOUS WASTE

- Ignitable—Can cause a fire and can easily burst into flames (e.g., gasoline, alcohol, paint solvents)
- Reactive—Unstable, may produce toxic fumes or be explosive (e.g., dry chlorine mixed with any organic product)
- Corrosive—Can eat into other materials (e.g., sulfuric acid, hydrochloric acid, sodium hydroxide)
- Toxic—Poisonous (e.g., mercury, lead, pesticides)

HW can be solid, liquid, or gas. Contact your project's or company's WM staff with questions if you are uncertain about your waste.

Handle HW with care:

- Do not mix hazardous with nonhazardous (e.g., solvent with used oil).
- Minimize MW generation (e.g., radioactive and HW).
- Do not mix or store incompatible wastes together (e.g., acid with solvent).

Contact your project's or company's WM staff with questions.

9.10 AREAS FOR THE TEMPORARY STORAGE OF HAZARDOUS WASTE

Satellite accumulation areas (SAAs), 90-day accumulation areas (90-DAAs), and central accumulation areas (CAAs) are specially designated locations on the ORR that may be used for the temporary accumulation or storage of HW. These areas must be preregistered with your UCOR project and properly posted before they can be used for waste accumulation or storage.

SAAs and 90-DAAs/CAAs are required to have a contingency plan and adequate aisle space for emergency response measures. All response equipment listed in the contingency plan must be readily accessible at the SAA or 90-DAA/CAA.

Contact your UCOR EC Lead or your company's EC staff for assistance if you are not sure that an area can be used for managing HW.

9.11 SATELLITE ACCUMULATION AREA

Containers having a total volume of up to 55 gal of HW or 1 qt of acutely HW may be stored in an SAA as long as there is an active process generating the waste and that process is near or next to the SAA. The container must be in good condition and compatible with the waste. If a waste container is not in good condition, the generator must immediately transfer to a container that is in good condition. Incompatible waste cannot be stored in the same container and must be separated from other materials and protected by any practical means (e.g., dike, concrete barrier). The SAA container must remain closed except for adding or removing waste or temporary ventilation.

An SAA must include the following emergency preparedness elements:

- A phone (or other communication device) with posted contact names and phone numbers of emergency personnel
- An alarm system
- Fire protection equipment (e.g., adequate water supply, fire extinguisher)

- Secondary containment
- Spill control equipment

A waste accumulation container held in an SAA must be located near or next to the process generating the HW (e.g., paint shop, garage). The container must be labeled with the words "Hazardous Waste" and an indication of the hazards of the contents (i.e., ignitable, corrosive, reactive, toxic, or pending analysis if unknown).

A container may stay in this area until the volume reaches 55 gal. Once the SAA is filled to its capacity (55 gal), the container(s) must be moved within 72 hr to a RCRA-permitted storage area or to a 90-DAA.

An SAA should be posted (display a sign) so it is clear that the area is being used to store waste.

After the work is done or the jobsite is closed, the waste must be disposed and the SAA closed and down posted.

9.12 90-DAY ACCUMULATION AREA

HW in excess of 55 gal may be temporarily stored for up to 90 days in a specifically designated/posted 90-DAA/CAA. The 90-DAA/CAA should be clearly marked (posted with a sign), a contingency plan, and all containers grouped according to the waste's hazard class.

Containers must be in good condition and compatible with the waste. If a waste container is not in good condition, the generator must immediately transfer to a container that is in good condition. Incompatible waste cannot be stored in the same container and must be separated from other materials and protected by any practical means (e.g., dike, concrete barrier). The 90-DAA/CAA container must remain closed unless adding or removing waste.

The container must be labeled with the words, "Hazardous Waste", the start date, and an indication of the hazards of the contents (i.e., ignitable, corrosive, reactive, toxic, or pending analysis if unknown). If waste is ignitable or reactive, then a "No Smoking" sign must be posted.

Incompatible waste cannot be stored in the same container and must be separated from other materials and protected by any practical means (e.g., dike, concrete barrier). Ignitable and reactive wastes must be located at least 15 m (50 ft) from the facility's property line.

Leave adequate aisle space (a good rule of thumb is 36 in.) to move containers, visually inspect containers for leaks, and provide access for emergency equipment.

Good recordkeeping is essential. Inspect 90-DAAs/CAAs every 7 days (even during periods of work stoppage and holidays) and have inspection records available.

A 90-DAA/CAA must include the following emergency preparedness elements:

- A phone (or other communication device) with posted contact names and phone numbers of emergency personnel
- An alarm system
- Fire protection equipment (adequate water supply, fire extinguisher)
- Secondary containment
- Spill control equipment

Weekly inspections of these areas must be conducted to ensure safe storage of waste and that equipment and workers are prepared to handle spills and emergencies.

9.13 MANAGEMENT AND STORAGE OF HAZARDOUS WASTE

Do:

- Ensure you are trained and qualified to handle HW.
- Keep the container lid closed and locked when not being filled.
- Clearly label container as "Hazardous Waste" and include an indication of the hazard (i.e., ignitable, corrosive, reactive, toxic, or pending analysis if unknown).
- Clearly indicate what type of waste is in the container.
- Use containers in good condition.
- Leave 2 in. of headspace when filling a drum.
- Date the container and move it to a RCRA-permitted storage area or to a 90-DAA once it is filled.
- Use a container that is compatible with the waste (e.g., do not put acid in a metal drum if the drum is not lined with a plastic liner).

Do not:

- Use a container with rust, cracks, leaks, bulges, or major dents.
- Overfill the container (put more than 50 gal in a 55-gal drum).
- Store incompatible waste in the same container.
- Miss a 90-DAA/CAA inspection.

9.14 HANDLING OF EMPTY CONTAINERS

- Separate empty containers (e.g., drums, overpacks, carboys, pressurized cans) that formerly contained hazardous or nonhazardous materials from others with content.

- Store empty drums upside down, either indoors or outdoors. This helps to keep moisture from accumulating in the empty drum.
- A container is determined to be empty if all contents have been removed using commonly employed practices and:
  - — It has no more than 1 in. of residue remaining at the bottom of the container; or
  - — No more than 3% by weight of container capacity of residual material remaining in the container (containers less than or equal to 110 gal in size); or
  - — No more than 0.3% by weight of container capacity of residue remaining in the container (containers greater than 110 gal in size).
- Any residue released when a container is crushed or punctured must be collected, analyzed, and disposed appropriately.
- Before transporting any empty container offsite, remove any facility name markings.
- Empty aerosol paint cans—Depressurize and drain the can. Such cans are considered scrap metal and are recycled.
- Empty pesticide containers—Follow the manufacturer's directions for disposal. Many pesticides are considered an acute HW, and the container will require triple rinsing prior to disposal.

9.15 ASBESTOS

9.15.1 What is Asbestos?

Asbestos is a family of naturally occurring mineral fibers uniquely suited for use in noncombustible, nonconducting, or chemically-resistant materials. It is used in building materials and electrical components because of its thermal and electrical insulation properties.

9.15.2 Where is Asbestos Found?

Asbestos may be found in cement, plaster, siding, roofing material, floor tiles, mastic adhesives, insulation (e.g., wall, wire, piping, boiler, turbine, feedwater), cable trays, and spray materials (used on ducts, beams, and equipment).

Asbestos-containing materials are classified as friable material (can be crumbled to powder by hand and, therefore, can be inhaled and are considered hazardous) and non-friable (not easily crumbled but may also need special handling).

9.16 POLYCHLORINATED BIPHENYLS

PCBs are hazardous compounds (usually found in oils) that have been used in dielectric fluid of electrical transformers. PCBs are practically insoluble in water, they do not burn except at high temperatures, they do not conduct electricity and they conduct heat very well, which made them popular for electrical use prior to them being banned. PCBs may also be found in bushings, capacitors, circuit breakers, metering devices, electrical cable,

electromagnets, hydraulic fluids, electric motors, ballasts for light fixtures, some coolant fluids, caulks, carbonless paper, and as an ingredient in paints. PCBs were present in certain transformers in ETTP process buildings, electrical switchyards and may be present in other structures on the ORR.

9.16.1 What Effect Can PCB Contamination Have on my Health or the Environment?

PCBs are very stable compounds and degrade very slowly in the environment. Some PCBs have been shown to cause cancer in animals and may cause cancer in humans. When burned, PCBs may be converted to other highly toxic compounds like dioxins and furans.

9.16.2 How Do I Know if a Piece of Equipment Contains PCBs?

Equipment at all facilities on the ORR is labeled according to the levels of PCBs present as determined by laboratory testing.

Labels are used to designate the following groups of PCB-containing items:

- "Non-PCB Equipment"—Less than 50 parts per million PCB.
- "PCB-Contaminated Equipment"—50–499 parts per million PCB.
- "PCB Equipment"—More than 500 parts per million PCB, which requires labeling, inspection, and inspection records.

Watch for spills and leaks under or near electrical equipment. Any leaks from PCB or PCB-contaminated equipment must be corrected and cleaned up immediately. Notify your supervisor; ESWO, the OC, or the LSS; or the facility manager if you discover suspected PCB leaks or spills. Any materials contaminated with spilled PCBs must be properly labeled, stored, and disposed of in an appropriate permitted waste facility. Contact your EC Lead for guidance prior to cleaning up any spill or leak.

10. OTHER TYPES OF WASTE AT ORR FACILITIES

- Low-level waste (LLW)
- Mixed low-level waste (MLLW)
- TSCA PCB waste (LLW)
- Transuranic (TRU) waste
- Universal waste (UW)
- Used oil
- CERCLA waste

10.1 LOW-LEVEL WASTE

- **What is LLW?**

  LLW is a broad category of waste. It consists primarily of radioactively contaminated hand tools, components, shoe covers, lab coats, cloths, paper towels, etc. These were items used in areas where radioactive material was present, and they generally carry a small amount of radioactivity. LLW can also include radioactively contaminated soil and equipment.

- **How is LLW stored?**

  LLW must be stored in approved containers and be inspected monthly.

- **How is LLW labeled?**

  Containers storing LLW must have radiological, nonhazardous waste, and contents information labels.

- **What happens to LLW?**

  LLW is transported and disposed at an approved facility owned by DOE (e.g., the Environmental Management Waste Management Facility [EMWMF] on the ORR or the Nevada National Security Site [NNSS]) or licensed by the U.S. Nuclear Regulatory Commission (NRC).

10.2 MIXED LOW-LEVEL WASTE

- **What is MLLW?**

  MLLW is waste that contains both radioactive and hazardous components as defined by the Atomic Energy Act and RCRA.

- **How is MLLW stored?**

  MLLW is stored in approved containers within facilities that have a RCRA permit. This permit has a list of criteria that includes weekly inspections, engineering and administrative controls, and training requirements.

- **How is MLLW labeled?**

  A RCRA HW label with an indication of the hazardous, radiological label, and contents information label are on all MLLW storage containers.

- **What happens to MLLW?**

  MLLW is disposed at an NRC-licensed or DOE facility with a RCRA permit, and the material must meet RCRA LDRs.

10.3 TSCA PCB LLW

- **What is TSCA PCB LLW?**

  TSCA PCB LLW contains both radiological and PCB components. TSCA regulates the use, storage, and disposal of PCBs.

- **How is TSCA PCB LLW stored?**

  It must be stored in approved containers inside a facility that has a secondary containment system and adequate roof and walls and containers must be inspected for leaks at least once every 30 days.

- **How is it marked?**

  This type of waste is stored in a container labeled with a PCB M_L 6 in. × 6 in. mark and contents information label.

- **What happens to TSCA PCB LLW?**

  It must be disposed of at an NRC-licensed facility or a DOE facility that is permitted to accept TSCA PCB LLW waste.

10.4 TRU WASTE

- **What is TRU waste?**

  TRU waste is radioactive waste that contains man-made elements heavier than uranium and is categorized by its composition as either contact-handled (CH) or remote-handled (RH). TRU MW is managed the same as MLLW except there are weekly and monthly inspection requirements.

- **How is TRU waste stored?**

  TRU waste is stored in approved containers within permitted RCRA facilities at ORNL.

- **How is TRU waste labeled?**

  A radiological label and contents information label are on all TRU waste containers.

- **What happens to TRU waste?**

  TRU waste is disposed of at the DOE Waste Isolation Pilot Plant (WIPP).

10.5 UNIVERSAL WASTE

UW is a category of RCRA HW that EPA created to encourage recycling. Four waste streams common to the three sites on the ORR include:

- Batteries—Typically rechargeable types, such as lead-acid, nickel-cadmium, nickel-metal hydride, and mercury-containing batteries; automotive lead-acid batteries destined for regeneration. Lead-acid batteries can be managed under the spent lead-acid battery reclamation standards if they will be shipped offsite to be reclaimed.
- Used lamps—Fluorescent, high intensity, neon, mercury vapor, high-pressure sodium, incandescent, and metal halide lamps.
- Mercury-containing equipment—A device or part of a device (including thermostats) that contains elemental mercury integral to its function.
- Pesticides—Stocks of recalled or unused pesticide products collected in a pesticide collection program for recycling.

- Aerosol cans—Minimize use and purchase when possible. Can be managed as either HW or UW. Contact your EC Lead to determine options for the project. UW may be accumulated for up to 1 yr before recycling. The start date must be readily available either on the container or in a logbook.

10.5.1 What Can I Do?

If you manage UW, you should do the following:

- Make sure containers are appropriate for the waste.
- Place a UW label, add the first date of accumulation, and identify the type of UW (i.e., UW-batteries, UW-lamp).
- Keep containers closed when not filling them to prevent spills and so as not to collect precipitation.
- Store aerosol cans must be stored in a structurally sound container.
- Make sure labels are visible on the containers of items.
- Make sure that tapes, fences, signs, etc., designating the collection area are in place and visible.
- Manage all leaks or spills as HW.

10.6 USED OIL

Many products used on the ORR qualify as used oil.

Used oils include electrical insulating oil, industrial hydraulic fluid, automotive transmission fluid, refrigeration oil, compressor oil, metal working fluids, and grease.

Collect used oil for recycling only in containers in good condition. Each container used must be clearly labeled or marked with the words “Used Oil,” even if oil is stored for only 1 day and must be covered or closed at all times to prevent rainwater from entering. There is no time limit for storing used oil, but containers must be inspected monthly.

10.6.1 What Can I Do?

- Make sure containers are in good condition (no rust, dents, bulges, or leaks).
- Make sure containers are marked “Used Oil.”
- Keep containers closed except when adding used oil.
- Clean up spills immediately.
- Do not put other liquid waste in used oil containers.
- Inspect containers monthly.

Before releasing a used oil container for transport, contact your supervisor to be sure that all transportation identification numbers and permits held by the receiving transporter are valid.

10.7 CERCLA WASTE

CERCLA waste is generated during the implementation of environmental cleanup or remediation conducted pursuant to CERCLA. CERCLA waste is also classified as one or more of the waste types identified above (e.g., hazardous, PCB, asbestos, universal, used oil) and projects must comply with all ARARs identified in the applicable CERCLA decision document. Administrative requirements such as permitting and waste storage time requirements (e.g., 90 days) are generally not applicable to CERCLA waste.

11. WETLANDS

Wetlands are common on the ORR. They serve many valuable environmental functions and are protected by state and federal laws and regulations, and by DOE orders. Wetlands are commonly characterized by standing water during a significant part of the year and may also have vegetation such as cattails.

11.1 WHAT CAN I DO?

- Locations of known wetland areas are mapped. The NEPA review required before the initiation of projects will include reviews of these maps to determine if wetlands will be impacted.
- If you suspect that a wetland has not been included in these maps, please contact your EC Lead to arrange for an investigation by qualified personnel.
- If a wetland area is impacted by any earth-disturbing activities, additional protection will likely be required. Contact your EC Lead for assistance.

12. WILDLIFE ON THE ORR

Wildlife, including both plants and animals, is abundant on the ORR. Much of the ORR is included in the ORWMA. Many species on the ORR are protected by state and federal laws and regulations, and by international agreements. The resulting regulatory framework can be quite confusing. Surveys have been made to establish the presence or absence of protected species on the ORR, but due to the nature both of wildlife and the operations, these surveys must be performed periodically to ensure that protected species have not moved back into areas once thought clear.

In addition, nuisance species sometimes move into facilities (including buildings) where they could interfere with operations or pose a danger to employees. Bats often roost in abandoned buildings and under the bark of certain species of trees. Raccoons and opossums frequently raid dumpsters and even sometimes enter buildings in search of food. Although uncommon, venomous snakes are present on the ORR. Ospreys, bald eagles, and migratory birds such as Canada geese nest on the ORR. All of these are protected species.

If necessary, wildlife can be relocated by Tennessee Wildlife Resources Agency (TWRA) personnel. Employees should never relocate, harass, or interfere with wildlife of any kind.

12.1 WHAT CAN I DO?

- Before conducting any activities that will disturb the environment (including earth-disturbing activities and removing vegetation in areas outside of the property protection fences) or demolishing buildings, be sure that wildlife will not be impacted. If wildlife may be impacted by work, contact your EC Lead for assistance.
- Do not feed wildlife (including feral cats and dogs).
- Keep dumpsters and other waste containers closed.
- If nuisance wildlife is interfering with operations or has entered a building, please contact your EC Lead to arrange for TWRA personnel to remove the wildlife.

13. ENVIRONMENTAL PAGER FACT SHEETS

The UCOR EC Program periodically issues *Environmental Pagers*, fact sheets that provide you with useful information about a variety of concerns and questions related to the environment and to the protection of natural resources. They can be found on the EMS intranet hub.

The *Environmental Pagers* are produced by a team of EC experts. Each concisely addresses key compliance information of interest to all workers in the office and in the field and helps us put important EC information to use wherever we are. Some of the topics include:

- Common RCRA violations
- Spill response
- The National Historic Preservation Act
- RCRA UW
- Aerosol cans as UW
- RCRA SAAs
- The EMS
- RCRA 90-DAAs
- NEPA
- SPCCs
- Used oil
- Fire ants
- Bats

If you have an idea for an *Environmental Pager* or questions about content, speak to your EC Lead or your company's EC staff.

14. ENVIRONMENTAL AWARENESS OFF THE JOB

UCOR is equally concerned with protecting the environment and your safety off the jobsite. Please use the information about the environment that you have learned while working in our facilities when you are away from work and share it with your family and friends or participate in community events that promote awareness.

15. SAFETY AND HEALTH QUESTIONS

UCOR has also issued UCOR-4087, *Safety and Health Handbook, Oak Ridge, Tennessee*, to help answer questions you may have about your safety and the safety of others you work with on the jobsite. If you have questions, discuss them with your supervisor or your project Safety and Health Operations Manager.

16. CONCLUSION

Thanks for taking the time to read this Handbook. Use it as a reference on the jobsite or in the office as you do work.

Although environmental laws, regulations, orders, and standards may vary depending on a project's scope of work or the location of the work activity, UCOR takes upon itself the responsibility to remain fully compliant with all applicable federal, state, local, and DOE requirements so the environment is protected, and expects each of us to do the same.

Keep in mind that although this Handbook is designed to recommend compliant and environmentally protective practices and to guide you in developing good work habits and a general awareness about the environment, it alone cannot guarantee that your work activity will meet all laws, regulations, orders, and local requirements. Contact your supervisor, EC Lead, or your company's environmental staff if you have any questions.

Remember that it is our collective responsibility to work in a manner that is protective of the environment and its natural resources. The safety, health, and well-being of every worker and the public at large, as well as our environment, are the most important assets we are entrusted to protect.

17. REFERENCES

48 *CFR* Part 970. *DOE Management and Operating Contracts*, Washington, D.C.

DOE G 450.4-1C. *Integrated Safety Management System Guide*, September 2011, U.S. Department of Energy, Washington, D.C.

———DOE O 450.2, Chg. 1 (MinChg). *Integrated Safety Management*, January 2017.

———DOE P 450.4A, Chg. 1 (MinChg). *Integrated Safety Management Policy*, January 2018.

DOE/OR-1014. *Federal Facility Agreement for the Oak Ridge Reservation*, January 1992, U.S. Department of Energy, Washington, D.C.

PPD-EC-1747. *Environmental Compliance Program*, latest revision, United Cleanup Oak Ridge LLC, Oak Ridge, TN.

UCOR-4087. *Safety and Health Handbook, Oak Ridge, Tennessee*, latest revision, United Cleanup Oak Ridge LLC, Oak Ridge, TN.

18. EMERGENCY SIGNALS AND REPORTING

Standard alerting tone on radios:

- Signal: High/low wavering tone.
- Action: Standby for information from ESWO, the OC, or the LSS.

Criticality accident alarm:

- Signal: Continuous, steady tone.
- Action: Exit the area as quickly as possible and go to the nearest Assembly Station.

Instructions for Emergency Reporting:

- Use the fire alarm box to summon help for any emergency. Emergency response personnel will respond to the location of the fire alarm box, so if it is safe, stand by the alarm box and provide information to the emergency response responders when they arrive.
- Use the phone numbers in this table to report onsite emergencies at each location.

  Note: At ORNL and Y-12, cell calls to 911 will slow response since the call will have to be re-routed from city/county service to OC/LSS response.

EMERGENCY CONTACTS

Location	1st	2nd (landline or cell)
ETTP, 1916-T2, 90 Union Valley, 100 Union Valley, 701 Scarboro, EMWMF	911 (landline or cell)	ESWO— 865-574-3282 or 865-574-4911
ORNL	911 (landline **only**)	LSS—865-574-6606
Y-12	911 (landline **only**)	OC—865-574-7172

Information:

For information on road closures, inclement weather, or schedule changes, do not call the ESWO. Call the UCOR Info Line at 865-241-INFO (865-241-4636) or sign up on the UCOR Mass Notification System (see the Emergency Services intranet hub).

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