



Summary of Annual Site Environmental Reports

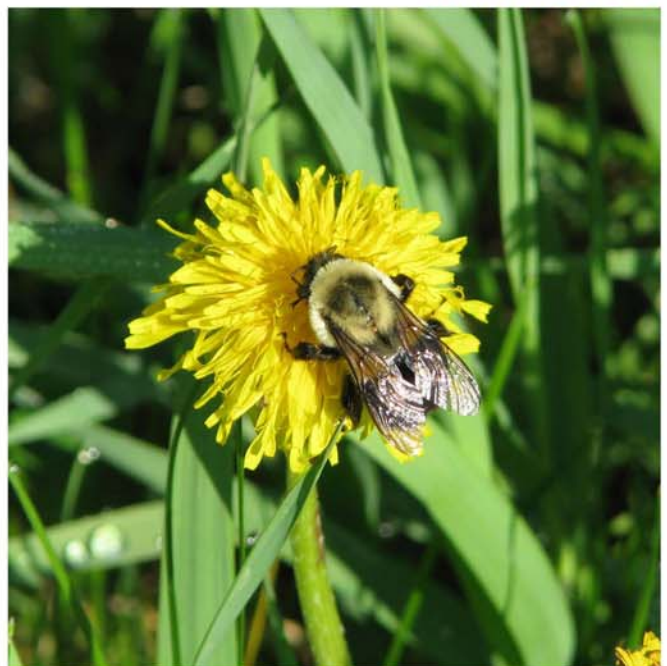
Calendar Year 2017



U.S. DEPARTMENT OF
ENERGY | Legacy
Management



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Cover photo captions:

Top left: This photo shows one of six test pits constructed on the armored side slope and vegetated top slope of the Lakeview, Oregon, Disposal Site. This pit was part of an Applied Studies and Technology study, *Effects of Soil-Forming Processes on Cover Engineering Properties*. Some objectives of the study were to evaluate the effects of natural processes on the performance of disposal cell covers and investigate options for improving the long-term surveillance and maintenance of covers.

Bottom left: The top photo shows new ion exchange treatment vessels and multimedia vessels with piping being installed as part of the Wastewater Treatment Optimization Project at the Fernald Preserve, Ohio, Site. The bottom photo shows low-level radioactive waste associated with the decommissioning and dismantlement of some elements of the Converted Advanced Wastewater Treatment (CAWWT) Facility.

Bottom right: This photo shows the rusty patched bumble bee. Pollinators like bees and butterflies are vital to flowering plants which depend on these species to produce fruit and seeds. As of April 2017, the Ecosystem Management Team implemented pollinator-friendly practices over 2564 acres of land since land management activities began in the late 1990s. The Ecosystem Management Team also supports initiatives regarding ecological health, conservation, land reuse, and land management.

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Abbreviations

AEA	Atomic Energy Act
AEC	U.S. Atomic Energy Commission
ARAR	applicable or relevant and appropriate requirement
ASER	Annual Site Environmental Report
AS&T	Applied Studies and Technology
BLM	Bureau of Land Management
BMP	best management practice
CAA	Clean Air Act
CAWWT	Converted Advanced Wastewater Treatment
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	<i>Code of Federal Regulations</i>
COC	contaminant of concern
CWA	Clean Water Act
CXE	Categorical Exclusion Evaluation
D&D	Decontamination and Decommissioning
DOE	U.S. Department of Energy
DOECAP	DOE Consolidated Audit Program
DRUM	Defense-Related Uranium Mines
EISA	Energy Independence and Security Act
EMS	Environmental Management System
EO	Executive Order
EPA	U.S. Environmental Protection Agency
EPCRA	Emergency Planning and Community Right to Know Act
EPEAT	Electronic Product Environmental Assessment Tool
ESA	Endangered Species Act
FFCA	Federal Facilities Compliance Act
FIFRA	Federal Insecticide, Fungicide, and Rodenticide Act
FIMS	Facility Information Management System
FUSRAP	Formerly Utilized Sites Remedial Action Program
HSWA	Hazardous and Solid Waste Amendments
ISO	International Organization for Standardization
LLW	low-level radioactive waste

LM	Office of Legacy Management
LMS	Legacy Management Support
LTS&M	long-term surveillance and maintenance
MBTA	Migratory Bird Treaty Act
MED	Manhattan Engineer District
mrem	milliroentgen equivalent man
NEPA	National Environmental Policy Act
NFPA	National Fire Protection Association
NHPA	National Historic Preservation Act
NORM	naturally occurring radioactive material
NPDES	National Pollutant Discharge Elimination System
NRC	U.S. Nuclear Regulatory Commission
NWPA	Nuclear Waste Policy Act
PCB	polychlorinated biphenyls
POC	point of compliance
Q&PA	Quality and Performance Assurance
RCRA	Resource Conservation and Recovery Act
RPP	Radiation Protection Program
SARA	Superfund Amendments and Reauthorization Act
SDWA	Safe Drinking Water Act
SHPO	State Historic Preservation Officer
SSP	Site Sustainability Plan
SWQS	State Water Quality Standards
TSCA	Toxic Substances Control Act
TSDF	treatment, storage, and disposal facilities
ULP	Uranium Leasing Program
UMTRCA	Uranium Mill Tailings Radiation Control Act
USACE	U.S. Army Corps of Engineers
USFS	U.S. Forest Service
USFWS	U.S. Fish and Wildlife Service

1.0 Reporting Requirement

U.S. Department of Energy (DOE) Order 231.1B Admin. Chg 1, *Environment, Safety and Health Reporting*, requires each DOE site to prepare an Annual Site Environmental Report (ASER) documenting the site's environmental conditions and compliance with DOE reporting requirements. The ASER is submitted to DOE headquarters annually and is available to the public. DOE's *Guidance for the Preparation of the 2017 Department of Energy Annual Site Environmental Reports* (April 2018) recognizes Office of Legacy Management (LM) sites have unique characteristics and suggests two alternatives to the preparation of the ASER: (1) prepare a scaled-down or streamlined version of the ASER reflecting the current nature and extent of site operations and monitoring programs, or (2) submit equivalent documentation providing the results of relevant environmental monitoring programs. This scaled-down report (alternative 1) meets the intent of DOE Order 231.1B Admin. Chg 1 and provides a summary of LM's programmatic and site-specific environmental activities, including reporting, for calendar year 2017. When practical, this report provides website links where programmatic and site-specific documents are publically accessible. The document versions in effect for the ASER reporting period may have been updated with newer versions.

2.0 Introduction

LM was established in 2003 to manage DOE's postclosure responsibilities at sites under its care and ensure the future protection of human health and the environment at those sites. The histories of the legacy sites vary, as do the regulatory regimes under which the sites are managed. Long-term surveillance and maintenance (LTS&M) plans or equivalent documents are prepared for the sites. These documents are available to the public and include site descriptions and information about site history, the nature and extent of contamination, closeout condition of the site, present and future monitoring and surveillance programs, and institutional controls. A description of the type and number of sites managed during the reporting period and their regulatory framework are provided below and on the DOE website at <https://energy.gov/lm/sites/lm-sites/programmatic-framework>. Site counts are updated annually and are obtained from the *LM Site Management Guide* (March 2018), available at <https://energy.gov/lm/downloads/site-management-guide>.

2.1 CERCLA/RCRA Sites

LM managed eight sites where remediation was conducted in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) or Resource Conservation and Recovery Act (RCRA), or both. Federal milling, processing, research, or weapons-manufacturing operations at these sites resulted in radiological or chemical contamination, or both.

2.2 Nevada Offsites

LM managed nine sites under the Nevada Offsites program, which includes sites where underground nuclear tests and experiments were performed outside of the Nevada National Security Site (formerly the Nevada Test Site). Underground nuclear testing was conducted for various purposes, including stimulating natural gas production and cataloging seismic

detonation signatures. Two sites in Nevada are managed under the regulatory authority of a Nevada-administered Federal Facility Agreement Consent Order, and the remaining seven sites are managed in collaboration with the host-state agencies.

2.3 UMTRCA Sites

The Uranium Mill Tailings Radiation Control Act (UMTRCA) (Title 42 *United States Code* Section 7901, as amended) addresses the remediation and regulation of uranium mill tailings at uranium mill sites addressed under Title I and Title II.

- Title I of UMTRCA identified inactive uranium ore-processing sites requiring remediation. LM managed 21 UMTRCA Title I sites during the reporting period, some of which contain encapsulated uranium mill tailings and associated contaminated material.
- Title II of UMTRCA addresses remediation and reclamation of uranium mill sites under specific license on or after January 1, 1978. LM managed six remediated UMTRCA Title II sites during the reporting period. The number will increase as ongoing site reclamations are completed and the sites are transferred from the licensee to LM for LTS&M.

2.4 FUSRAP Sites

The U.S. Atomic Energy Commission (AEC), predecessor to DOE, established the Formerly Utilized Sites Remedial Action Program (FUSRAP) to remediate sites where radioactive contamination remained from the Manhattan Engineer District (MED) projects and early AEC operations. DOE assessed more than 600 candidate facilities and determined 46 would be eligible for remediation under FUSRAP. DOE remediated 25 sites from 1974 to 1997, when Congress directed the U.S. Army Corps of Engineers (USACE) to assume responsibility for the remediation work of the remaining 21 designated FUSRAP sites. USACE retains responsibility for each site for 2 years after remediation and then transfers the long-term stewardship responsibilities of the site to LM. Long-term stewardship may include surveillance and maintenance of remediated sites or be limited to management of site records and responding to stakeholder inquiries. LM managed 31 FUSRAP sites during the reporting period. The number will increase as ongoing site reclamations are completed and the sites are transferred to LM for LTS&M.

2.5 D&D Sites

DOE established the Defense Decontamination and Decommissioning (D&D) Program for the remediation of surplus DOE facilities. D&D sites have been transferred to LM for LTS&M. LM managed five D&D sites during the reporting period. Four of these sites are former nuclear power plants, and the fifth was a uranium ore pilot processing and shipping center.

2.6 NWPA Section 151 Site

Certain sites with low-level radioactive contamination remediated by the owner under the U.S. Nuclear Regulatory Commission (NRC) Site Decommissioning Management Program can be transferred to the federal government under Section 151 of the Nuclear Waste Policy Act (NWPA). LM managed one NWPA Section 151 site for LTS&M during the reporting period.

2.7 MED/AEC Legacy Sites

LM is responsible for the records management and stakeholder support of 10 remediated MED/AEC Legacy sites, formerly referred to as “Other” sites. MED sites were associated with the program during World War II to produce the first nuclear weapons, whereas AEC sites were associated with early weapons development.

2.8 State Water Quality Standards Site

LM is responsible for the records management and stakeholder support of one site remediated to state requirements and no federal requirements were applicable. For this site, DOE completed the cleanup activities based on an order from a regional water quality control board. The U.S. Bureau of Land Management (BLM) then relinquished and terminated the right-of-way reservation.

2.9 Other LM Activities and Programs

In addition to the responsibilities at postclosure sites described above, other LM activities include:

- Maintenance of five radiometric calibration facilities.
- Managing the Uranium Leasing Program (ULP), including administrative, oversight, and inspection activities for 31 uranium mining lease tracts in southwestern Colorado.
- Managing the Defense-Related Uranium Mines (DRUM) Program, which was established by LM in 2016 as a result of the National Defense Authorization Act for Fiscal Year 2013 to verify and validate the condition of over 4000 defense-related uranium mine sites. Verification and validation activities include mine location reconciliation, field inventory, environmental sampling, and risk scoring assessment completion to determine potential physical safety hazards and risks to human health and the environment.
- Managing the Applied Studies and Technology (AS&T) Program, which was established to incorporate improvements in scientific understanding and technology applications with management strategies to decrease long-term costs of LM activities.
- Managing the LM Business Center Records Storage Facility, certified by the National Archives and Records Administration as an official repository for the storage of federal records. The facility is environmentally controlled and capable of storing approximately 150,000 cubic feet of physical records including a cold storage vault for microfilm, negatives, photographs, and other media.
- Supporting LM programmatic activities at the following 10 occupied office locations:
 - Fernald Preserve, Ohio
 - Grand Junction, Colorado
 - Monticello, Utah
 - Morgantown, West Virginia
 - Pinellas, Florida

- Tuba City, Arizona
- Washington, DC
- Weldon Springs, Missouri
- Westminster, Colorado
- Window Rock, Arizona

3.0 Summary of General Environmental Reporting

3.1 Oversight

DOE assigns an LM site manager or program manager to each LM site or activity to oversee the scope of work, address stakeholder concerns, and ensure activities are compliant and protective of human health and the environment. All reports associated with site projects or activities are thoroughly reviewed to ensure data is accurately reported.

3.2 Summary of Site-Specific Activities

In 2017, LM managed the long-term care of 92 sites. LM classifies the sites as Category 1, Category 2, or Category 3 based on the actual or anticipated LTS&M activities associated with the site. In general, fewer activities and less environmental monitoring are performed at the lower category sites, resulting in less documentation and reporting. However, a site's category can change depending on changes in site conditions (e.g., changes in groundwater remediation strategies or regulatory changes). The three categories of LM sites and their site counts according to the *Site Management Guide* (March 2018) are as follows (sites geographically grouped as one in the *Site Management Guide* are addressed individually in Tables A-1 through A-4 of Appendix A):

1. Category 1 sites

- Category 1 sites are listed in Table A-1 and include 39 LM sites. LM activities include records-related activities and stakeholder support. Historical site information is available online and accessible for stakeholders.
- LM is not required to routinely inspect or sample these sites for environmental monitoring data, and there are no annual reporting requirements.

2. Category 2 sites

- Category 2 sites are listed in Table A-2 and include 44 LM sites.
- LM activities may include:
 - Conducting required inspections (typically annually) and maintenance
 - Sampling for environmental monitoring data, as required
 - Managing site records and providing support on stakeholder inquiries and requests for information (historical site information and monitoring results are accessible online for stakeholders)

- Implementing and managing administrative controls (e.g., access agreements or land use control through federal ownership) and institutional controls
- Preparing inspection, monitoring, and compliance reports, as required

3. Category 3 sites

- Category 3 sites are listed in Table A-3 and include nine LM sites.
- LM activities may include:
 - Operating and maintaining remedial action systems (e.g., active treatment systems for contaminated groundwater or surface water)
 - Conducting required inspections (typically annually) and maintenance
 - Sampling for environmental monitoring data, as required
 - Managing site records and providing support on stakeholder inquiries, requests for information, and routine communications (historical site information and monitoring results are accessible online for stakeholders)
 - Implementing and managing administrative and institutional controls
 - Preparing inspection, monitoring, and compliance reports, as required

Tables A-1 through A-4 summarize the monitoring and associated reporting for each site. The majority of the information in the tables is available on site-specific websites accessible from the LM Sites website (<https://www.energy.gov/lm/sites/lm-sites>) or from the site-specific links in Appendix A of this report. Any additional information is available upon request. When annual inspection and monitoring reports are issued, LM sends copies or notices of electronic availability to site stakeholders, including state and federal regulators and local governments. LM is providing Appendix A as a summarized version of the environmental reporting in lieu of individual reports.

In addition to long-term care of sites, LM is responsible for activities associated with the following facilities and programs:

1. Radiometric Calibration facilities

- Calibration facilities consist of five facilities used for the calibration of radiometric instrumentation for measurements of radium (uranium), thorium, and potassium. LM grants access to these facilities to non-LM users upon request.
- The primary calibration facilities are located in Grand Junction, Colorado (Grand Junction Regional Airport and Grand Junction, Colorado, Site) and secondary facilities are located at Grants, New Mexico; George West, Texas; and Casper, Wyoming.
- LM activities include facility maintenance, annual inspections, and records-related activities.

2. ULP

- The ULP consists of 31 uranium mining lease tracts within southwestern Colorado.
- LM activities include:
 - Conducting annual inspections of mining operations to assure leaseholders adhere to lease stipulations

- Oversight of leaseholder routine maintenance activities
 - Preparation of an annual status and activities report summarizing LM activities for the ULP during the calendar year
 - Due to a court-ordered injunction, leaseholders did not perform any exploration, development, mining or extraction, or reclamation activities on the DOE lease tracts during the reporting period.
3. DRUM Program
- The DRUM Program consists of more than 4000 defense-related uranium mines (mines); most are in Arizona, Colorado, New Mexico, Utah, and Wyoming.
 - LM activities include:
 - Verification and validation of the condition of mines on lands managed by BLM and U.S. Forest Service (USFS).
 - Preparation of a summary report for each mine. Reports will be transmitted to the appropriate agency: BLM or USFS.
 - Verification and validation of approximately 400 BLM and USFS mines in Colorado, New Mexico, and Utah was conducted.
4. AS&T Program
- The AS&T Program includes the management of long-term and short-term studies which involve collaboration with other federal agencies, national laboratories, universities, and the scientific and environmental community.
 - LM activities include:
 - Long-term studies conducted to enhance LM’s strategic capabilities by optimizing current LM operations and advancing technology applications.
 - Short-term investigations considered on an ad hoc basis such as collaborating across multiple LM sites, supporting current long-term work, and developing white papers.
 - Management of the Environmental Sciences Laboratory at the LM office at Grand Junction, Colorado, which features a geochemical laboratory, ecology laboratory, petrography facility, and an instrument calibration facility.
 - Preparation of an internal annual report summarizing AS&T activities for each fiscal year.

4.0 Summary of Environmental Management System and Sustainability

As required by prior DOE orders and DOE Order 436.1, *Departmental Sustainability*, LM has had a fully implemented Environmental Management System (EMS) since October 2005. LM has declared full implementation of the EMS every 3 years starting in 2009, with the latest declaration on June 30, 2015. LM’s EMS is a comprehensive system to incorporate life-cycle

environmental considerations into all aspects of the LM mission to maximize beneficial resources, minimize wastes and adverse environmental impacts, and meet or exceed compliance with applicable regulations and DOE requirements. The EMS serves as the platform for adhering to, implementing, and tracking environmental requirements for compliance and sustainability. The LM EMS is consistent with the framework of the International Organization for Standardization (ISO) Standard 14001, *Environmental Management Systems*; the Integrated Safety Management System requirements of DOE Policy 450.4A Chg 1, *Integrated Safety Management Policy*; and Title 10 *Code of Federal Regulations* Section 851, *Worker Safety and Health Program*. LM conducted an independent assessment of the LM EMS in early 2017 in accordance with ISO Standard 14001 and LM's *Environmental Management System Description*.

The Associate Undersecretary of DOE Office of Environment, Health, Safety, and Security issued a memorandum AU21-16-N1-0050, *Departmental Use of Environmental Management Systems* in October 2016 requiring DOE sites to conform to the new ISO 14001:2015 version by October 1, 2018. LM worked on revising their EMS to conform to the new standard during the reporting period.

The LM EMS public website describes the EMS and provides links to many of the documents and reports identified in this section (<https://energy.gov/lm/services/joint-environmental-management-system-ems>). The following programmatic documents describe LM's EMS and are accessible on the LM EMS public website on the "Guiding Documents and Links" page (<https://energy.gov/lm/services/joint-environmental-management-system-ems/guiding-documents-and-links>).

- LM's *Environmental Policy* (LM PO 436.1C)
- LM's EMS Description (LM-Procedure-3-20-12.0-0.0. LMS/POL/S04346)

4.1 Performance Measures

The following is a summary of reporting mechanisms for the EMS, some of which are available on the LM EMS public website on the "EMS Goals/Progress/Plans/Reports" page (<https://energy.gov/lm/services/joint-environmental-management-system-ems/ems-goalsprogressplansreports>).

The following documents are available on the EMS Goals/Progress/Plans/Reports page:

- LM Site Sustainability Plan (SSP): LM reports past performance and future plans for meeting sustainability goals in the SSP. This assists DOE with meeting its sustainability goals, objectives, and targets established in Executive Order (EO) 13693 (supersedes EOs 13423 and 13514 on March 19, 2015); DOE Order 436.1, *Departmental Sustainability*; and the DOE Strategic Sustainability Performance Plan.
- Consolidated Energy Data Report: This annual report contains information on electronics stewardship, energy and water usage, waste diversion data, renewable energy generation, greenhouse gas emissions, high-performance sustainable buildings, and sustainability projects. Information is entered into the DOE Sustainability Dashboard.
- LM Facility EMS Annual Report: This report identifies the scope of LM's EMS and the status of sustainability goal performance and conformance with the EMS standard.

- **LM Significant Environmental Aspects:** This document describes the four categories of significant environmental aspects from LM operations. Environmental aspects are the attributes of project and program activities, products, and services that interact with the environment and may create a significant impact if not controlled.

Other reporting mechanisms for the EMS include:

- **Energy Independence and Security Act (EISA) Section 432 Report:** EISA reinforces the energy reduction goals for federal agencies put forth in EO 13693. Section 432 requires federal agencies to identify facilities constituting at least 75% of the agency’s facility energy use. Comprehensive energy and water evaluations of 25% of facilities are completed each year, and an evaluation of each facility is completed once every 4 years. Section 432 reports are submitted annually to provide a status on energy and water evaluations, benchmarking, and project implementation and measures follow-up.
- **Facility Information Management System (FIMS) updates:** FIMS collects information about real property attributes and use, including compiling a list of assets excluded from the energy intensity reduction goal. The database also stores data on buildings assessed against the High Performance Sustainable Building goals.
- **Federal Acquisition Statistical Tool updates:** This tool collects data about current and past federal fleet fuel use, inventory, and acquisitions.

4.2 Accomplishments, Awards, and Recognition

LM received the following award for EMS-related activities:

- An Electronic Product Environmental Assessment Tool (EPEAT) Purchasers Award for purchasing EPEAT-rated electronic equipment.

5.0 Summary of Environmental Compliance

The following subsections summarize compliance with applicable regulations and the related 2017 reporting. Because LM manages sites under different regulatory frameworks, postclosure environmental requirements vary based on the activities being conducted.

5.1 Environmental Remediation and Waste Management Compliance

CERCLA: CERCLA was enacted by Congress in 1980 to enforce cleanup and reporting requirements applicable to abandoned or uncontrolled hazardous waste sites. CERCLA was amended in 1986 by the Superfund Amendments and Reauthorization Act (SARA). Typically, the lead agency at the federal facility (DOE) initiates a response action under CERCLA if there is a release or a substantial threat of a release of a hazardous substance into the environment. Remedial actions have been completed at LM sites regulated by the U.S. Environmental Protection Agency (EPA) with the expectation of long-term monitoring and active groundwater remediation at several sites. The status of the activities at each site is available on site-specific links provided in Appendix A of this report. A Five-Year Review report is required for a CERCLA site with residual contamination (see Table A-2 and Table A-3) to evaluate whether the remedy at the site remains protective of human health and the environment.

LM completed Five-Year Review reports for the following sites:

- Monticello, Utah, Disposal and Processing Sites
- Rocky Flats Site, Colorado

RCRA: RCRA was enacted by Congress in 1976 to govern the management of solid and hazardous waste and establish standards by which waste generators and treatment, storage, and disposal facilities are regulated. RCRA was amended in 1984 by the Hazardous and Solid Waste Amendments (HSWA). Among other requirements, HSWA mandated waste minimization, corrective action, and land disposal restrictions for hazardous waste. RCRA remains an applicable or relevant and appropriate requirement (ARAR) at many LM sites for disposal cell maintenance and groundwater monitoring, and the sites maintain compliance with these ARARs.

- Each site generating hazardous waste maintained a Very Small Quantity Generator status.
- Hazardous waste was shipped from the Grand Junction site to a local county hazardous waste collection facility for Very Small Quantity Generators for disposal.
- An active RCRA HSWA corrective action permit issued by the State of Florida is maintained for the Pinellas County, Florida, Site. The permit includes requirements for remedial action at the site under state Global Risk-Based Corrective Action regulations.

Federal Facilities Compliance Act (FFCA): FFCA was enacted in 1992 and amended RCRA with the objectives of bringing all federal facilities into compliance with applicable federal and state hazardous waste laws, of waiving federal sovereign immunity under those laws, and of allowing the imposition of fines and penalties. The FFCA gave EPA the authority to issue administrative compliance orders to federal agencies in violation of hazardous waste laws and requires EPA to conduct annual inspections of RCRA Part B-permitted federal treatment, storage, and disposal facilities.

- Programmatic policies and plans and site-specific plans and procedures are maintained for LM sites, as needed, to comply with all applicable requirements under the FFCA.

Emergency Planning and Community Right to Know Act (EPCRA) and SARA: EPCRA was enacted by Congress in 1986 to help communities plan for chemical emergencies. It also requires industry to report to federal, state, and local governments on the storage, use, and releases of hazardous substances. EPCRA reports under SARA Section 312 are required annually for sites storing chemicals in amounts exceeding threshold planning quantities.

- EPCRA reports were submitted for the Rocky Flats Site, which listed lead-acid batteries, the contents of which exceeded EPCRA threshold planning quantities.

Toxic Substances Control Act (TSCA): TSCA was enacted in 1976 and regulates the control (manufacturing, use, distribution in commerce, abatement, and disposal) of toxic substances including polychlorinated biphenyls (PCBs), asbestos, lead, mercury, and radon. LM's management of some older buildings may require assessment and abatement of TSCA-regulated substances, especially asbestos.

- LM awarded a subcontract to a qualified firm to develop the abatement design plan for the abatement of TSCA-regulated material at the Piqua, Ohio, Decommissioned Reactor Site.
- No other TSCA-regulated actions occurred at other LM sites during this reporting period.

Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA): FIFRA regulates the distribution, use, and sale of pesticides and requires a certified applicator to supervise the application of herbicides or pesticides on property.

- LM uses herbicides and pesticides at many LM sites as part of land stewardship responsibilities. Policies, procedures, and manuals are in place to ensure herbicides and pesticides are applied in compliance with FIFRA.

Radioactive Waste Management: The type of radioactive waste generated at an LM site is dependent on the source and characteristics of the radioactivity and the regulatory driver(s) associated with radioactive material at the site. For example:

- Radioactive waste generated at an UMTRCA site is characterized as:
 - residual radioactive material (UMTRCA Title I site) or
 - Atomic Energy Act (AEA) Section 11e.(2) byproduct material (UMTRCA Title II site)
- Radioactive waste generated at a CERCLA or RCRA site is typically characterized as:
 - Low-level radioactive waste (LLW) or
 - Naturally occurring radioactive material (NORM)

Management and disposal requirements differ for these specific waste types. Radioactive wastes are managed in accordance with the AEA; UMTRCA; 10 *Code of Federal Regulations* Part 40 (10 CFR 40), “Domestic Licensing of Source Material”; and DOE Order 435.1 Chg 1, *Radioactive Waste Management*.

- At the Grand Junction, Colorado, Disposal Site, LM continues to operate and receive radioactive materials. This site is used for the permanent disposal of specific radioactive materials described in Sections 101 and 102 of Title I of UMTRCA and defined in the disposal facility waste acceptance criteria. The disposal cell is authorized by Congress to remain open until it reaches capacity or until 2023, whichever comes first. Legislation has been proposed in the U.S. House of Representatives and the U.S. Senate to extend Congress’s authorization to keep the disposal site open until 2048.
- At the Fernald Preserve, LLW associated with routine site inspections, construction projects, and the decommissioning and dismantlement of some elements of the CAWWT Facility was shipped to the Waste Control Specialists facility in Andrews, Texas, for disposal.
- At the Rocky Flats Site, LLW consisting of spent treatment media from the Solar Ponds Plume Treatment System was shipped offsite to the Energy Solutions Inc. Clive disposal facility in Grantsville, Utah.
- At the Durango, Colorado, Disposal Site, residual radioactive material was generated from the decommissioning of an onsite evaporation pond. The waste was disposed at the Grand Junction disposal site.
- At the Grand Junction Regional Airport calibration facility, NORM consisting of concrete slurry was generated. The waste was disposed at the Grand Junction disposal site.

5.2 Radiation Protection Compliance

AEA: The purpose of the AEA is to assure the proper management of source, special nuclear, and byproduct material. The AEA and the statutes amending it delegate the control of nuclear energy primarily to DOE, NRC, and EPA. DOE established LM to ensure DOE's postclosure responsibilities are met and to provide DOE programs for LTS&M, records management, work force restructuring and benefits continuity, property management, land use planning, and community assistance.

UMTRCA: UMTRCA is a federal law providing for the safe and environmentally sound disposal, long-term stabilization, and control of uranium mill tailings in order to minimize or eliminate radiation health hazards to the public. Under Title I of UMTRCA, DOE remediated inactive uranium ore-processing sites in accordance with standards promulgated by EPA. Uranium ore-processing sites addressed by Title II of UMTRCA were active when the act was passed in 1978. DOE administers Title I and Title II sites under the provisions of NRC general licenses. LM manages UMTRCA Title I and Title II sites, including inspection, monitoring, and maintenance activities.

- Requirements for inspections, monitoring, and maintenance activities are specified in site-specific Long-term Surveillance Plans, LTS&M Plans, and Groundwater Compliance Action Plans, which are reviewed and agreed to by NRC.
- Two LM-wide inspection and monitoring reports, one for Title I sites (<https://energy.gov/lm/downloads/title-i-disposal-sites-annual-report-0>) and one for Title II sites (<https://energy.gov/lm/downloads/title-ii-disposal-sites-annual-report>), are compiled and submitted annually to NRC. These reports present the results of LTS&M activities at each of the UMTRCA sites as part of the general license requirements.

DOE Order 458.1 Chg 3, Radiation Protection of the Public and the Environment:

DOE Order 458.1 establishes requirements to protect the public and the environment against undue risk from radiation associated with radiological activities conducted under the control of DOE.

- In July 2017, the *Environmental Radiation Protection Program Plan* (LMS/POL/S13339) was issued to ensure work involving radiological hazards is compliant with the requirements of DOE Order 458.1. The implemented processes and measures are tailored to LM activities and reflect a graded approach commensurate with the hazard or risk to the public and the environment.

5.3 Air Quality and Protection Compliance Status

Clean Air Act (CAA): The CAA was enacted in 1970 to control sources of air pollution from the following three categories: new and existing sources subject to ambient air quality regulations through source-specific emission limits; new sources subject to more stringent control technologies and permitting requirements; and specific air pollution problems, including hazardous air pollutants and visibility impairment subject to National Emission Standards for Hazardous Air Pollutants. A comprehensive operating permit program was established in 1990 to consolidate all applicable requirements for a given source of air pollution under one program. Title V regulations and permits are a part of this program.

- There were no major sources of criteria air pollutants or hazardous air pollutants at LM sites.

5.4 Water Quality and Protection Compliance Status

Clean Water Act (CWA): The CWA establishes the basic structure for regulating discharges of pollutants into the waters of the United States and regulating water quality standards for surface waters. Under the CWA, EPA's National Pollutant Discharge Elimination System (NPDES) permit program controls discharges. In 2017, multiple LM sites maintained NPDES permits. These NPDES permits include discharge permits and storm water permits as described below:

- At the Fernald Preserve, compliance sampling of nonradiological pollutants is conducted from storm water runoff and treated effluent discharges in compliance with a state-administrated NPDES permit.
 - A permit-to-install was granted by Ohio EPA to proceed with the Fernald Preserve wastewater optimization project to downsize the wastewater treatment capacity. There were no changes to discharge sampling, discharge limitations, or reporting schedules.
- At the Mound, Ohio, Site, an NPDES permit is maintained. This permit covers the discharge of treated groundwater under a CERCLA authorization demonstrating compliance with the CWA. No discharge has occurred since September 15, 2014, to allow for an undisturbed evaluation of the enhanced attenuation field demonstration involving the injection of edible vegetable oil into the groundwater.
- At the Weldon Spring, Missouri, Site, an NPDES permit is maintained. This permit covers discharges from the Leachate Collection and Removal System and is maintained as a contingency to current disposal methods. The permit was renewed by the Missouri Department of Natural Resources on December 1, 2017.
- Pest management programs at LM sites are implemented in accordance with the EPA Pesticide General Permit (issued under the CWA NPDES program) or a state-issued general permit (for geographic areas where EPA is not the NPDES permitting authority). Such permits regulate point source discharges of residue producing biological and chemical pesticides.

CWA Storm Water Management and the EISA: A storm water management program was established by the CWA to reduce runoff and improve water quality. Under Section 438 of EISA, federal agencies are required to reduce storm water runoff from federal development and redevelopment projects to protect water resources. LM evaluates all construction projects to ensure preconstruction and post-construction storm water management standards are met and erosion controls are implemented as required based on the area of disturbance of the property.

- At the Rocky Flats Site, LM managed storm water in accordance with the site *Erosion Control Plan*, which meets the substantive requirements for storm water permitting. EPA is the NPDES permitting authority for the site and has approved this approach. Soil disturbances are controlled by institutional controls managed through the *Rocky Flats Legacy Management Agreement*.
- At the Fernald Preserve, LM managed sitewide and construction storm water in accordance with the *Fernald Preserve, Fernald, Ohio, Storm Water Pollution Prevention Plan* (LMS/FER/S03161) and the current Fernald NPDES permit.

- LM managed storm water as a best management practice (BMP) at the Durango disposal site in association with a construction project to decommission an evaporation pond and at the Grand Junction Regional Airport calibration facility in association with maintenance activities.

Safe Drinking Water Act (SDWA): The SDWA, enacted in 1974, authorized EPA to regulate contaminants in drinking water and required EPA to establish national standards to be implemented and enforced by authorized states.

- SDWA is an ARAR for many LM sites in regard to groundwater contamination. ARAR information is detailed in the environmental monitoring reports for each site.

Executive Order 11988, Floodplain Management: EO 11988, enacted in 1977, requires federal agencies to avoid, to the extent possible, short- or long-term work, activities, or disruption causing adverse impacts in floodplains and direct and indirect development in floodplain areas wherever there is a practical alternative.

- LM considers working alternatives to avoid floodplains when possible and complies with this EO and other federal, state, tribal, and local requirements, as applicable. Changes to flood hazard determinations are noted in the *Federal Register*, tracked for LM sites, and identified in the Legacy Management Support (LMS) *Environmental Compliance Regulatory Review Quarterly Report*.

Executive Order 11990, Protection of Wetlands: The purpose of EO 11990 is to “minimize the destruction, loss or degradation of wetlands and to preserve and enhance the natural and beneficial values of wetlands.” To meet these objectives, EO 11990 requires LM to consider alternatives to work in or near wetland sites and to limit potential damage if an activity affecting a wetland cannot be avoided. When unavoidable, LM complies with the requirements specific to the applicable nationwide permit and any applicable state or tribal requirements. LM promotes the ecological sustainability and enhancement of wetlands when considering the disposition and reuse of federal lands.

- Fernald Preserve staff continued long-term monitoring of mitigation wetlands with amphibian surveys and hydrologic monitoring using shallow piezometers.

5.5 Other Environmental Statutes Compliance Status

National Environmental Policy Act (NEPA): NEPA was enacted in 1970 to help public officials make decisions based on an understanding of environmental consequences, to foster public participation, and to take actions to protect, restore, and enhance the environment. It requires federal agencies, including LM, to evaluate the potential environmental effects of proposed federal agency actions. NEPA documentation is typically not required for CERCLA sites that considered NEPA values in their decision documents. Actions at non-CERCLA LM sites are typically within categorically excluded classes of actions. The evaluations of these actions are documented in Categorical Exclusion Evaluations (CXE) and Categorical Exclusion Determination Forms, the latter of which are accessible for public review on the following website: <https://energy.gov/lm/services/joint-environmental-management-system-ems/national-environmental-policy-act-nepa>.

- LM NEPA documents completed during the reporting period included:
 - CXE: 18
 - Environmental assessments: 0
 - Environmental impact statements: 0

Note: Environmental assessments were ongoing for the Central Nevada Test Area and the Bear Creek, Wyoming, Disposal Site during the reporting period.

Endangered Species Act (ESA): Under Section 7 of the ESA, DOE consults with the U.S. Fish and Wildlife Service (USFWS) on any action that may affect threatened or endangered species or their designated critical habitat. LM evaluates the potential presence of federally listed threatened or endangered species or their designated critical habitat during the project planning or NEPA process or whenever relevant changes in listings occur. For example, LM performs an evaluation if a candidate species is elevated to threatened or endangered status or if designated critical habitat is established at or near an LM site. The USFWS's Information for Planning & Conservation online tool is used to obtain information on species occurrence and habitat. If LM determines a listed species may be affected by its activities, a Section 7 consultation with USFWS is initiated and a biological assessment is prepared. Additional consultation with tribal authorities may be required on tribal lands.

- Prompted by the federal listing for Gunnison sage-grouse, LM completed a biological assessment in November 2017 to assess impacts from operations at the Monticello disposal and processing sites on threatened and endangered species and their critical habitat. With submission of the biological assessment, LM reinitiated formal consultation with USFWS.
- In November 2017, LM determined a biological assessment is not necessary for site activities in the Lower Colorado River Basin because these activities are not likely to affect threatened or endangered species or their critical habitat.
- LM submitted a biological assessment to the USFWS evaluating impacts to the Preble's meadow jumping mouse for the North Walnut Creek Hillside Stabilization and Groundwater Management Project at the Rocky Flats Site. LM received a biological opinion for the project from the USFWS on March 29, 2017, and the project is currently ongoing. Several other project notifications were made to the USFWS in accordance with the requirements in the Rocky Flats Site programmatic biological assessment.
- Fernald Preserve staff delayed the timing of field activities to avoid potential impacts to Sloan's crayfish, Indiana bat, and northern long-eared bat.
- LM signed a 5-year Cooperative Agreement with USFWS and the Cincinnati Zoo to introduce the federally endangered American burying beetle to the Fernald Preserve through 2018. A release of 115 pairs of beetles occurred in June and July 2017. LM renewed the cooperative agreement in October 2017, extending annual releases through 2022.

Migratory Bird Treaty Act (MBTA): The MBTA prohibits the possession or destruction of migratory birds or their parts, eggs, and nests without a permit from USFWS. Most birds present at LM sites are protected under this act, and compliance is often achieved by timing disruptive activities to avoid the nesting season of migratory bird species.

- LM submitted a report for the Council for the Conservation of Migratory Birds to DOE's Office of Sustainable Environmental Stewardship in 2017 detailing actions LM completed during the previous year to protect migratory birds.
- The North Walnut Creek Hillside Stabilization and Groundwater Management Project activities at the Rocky Flats Site were completed in 2017 without any impacts to nesting migratory birds. Efforts to minimize the potential impacts to migratory birds included maintaining short grass to deter nesting birds and installing nesting deterrents such as coyote cutouts.
- The Fernald Preserve maintains a Nest Destruction Permit issued by the Ohio Department of Natural Resources. This permit is for the removal of Canada geese nests and eggs, if they are determined to be a nuisance.

Bald and Golden Eagle Protection Act: This act provides additional protection to bald and golden eagles by prohibiting the "take" of these species, which includes possession, destruction, harassment, or disturbance without a permit from the secretary of the interior.

- No specific actions were taken under the Bald and Golden Eagle Protection Act at LM sites during this reporting period.

National Historic Preservation Act (NHPA): This act established a comprehensive national policy concerning historic and archaeological resource protection. Section 106 of NHPA compels federal agencies to take into account the effect of their projects on historic and archaeological resources, even if projects are not located on their lands. Section 110 of NHPA states federal agencies must identify and manage historic properties under their jurisdiction or control.

- LM initiated the Section 106 consultation process 15 times in 2017 with six State Historic Preservation Officers (SHPOs) and three Tribal Historic Preservation Officers for 10 LM sites. In support of these consultations, the following cultural resource inventories were conducted:
 - Lakeview, Oregon (an UMTRCA Title I site): A 0.76-acre archaeological survey was completed in support of the evaluation of soil-forming processes (i.e., pedogenesis) by AS&T. No historic properties were found within the surveyed areas; the Oregon SHPO concurred with the findings of the survey and the LM determination of no historic property subject to effect.
 - Shirley Basin South, Wyoming (an UMTRCA Title II site): A 7.5-acre archaeological survey was completed in support of the evaluation of soil-forming processes (i.e., pedogenesis) by AS&T. No historic properties were found within the surveyed areas. The Wyoming SHPO concurred with the findings of the survey and with LM's determination of no historic property subject to effect.
- In accordance with Section 110, the following actions were taken:
 - Piqua, Ohio, site (a D&D site): A decommissioned 1960s-era nuclear reactor building was evaluated for historic significance through the preparation of a Historic Building Survey and was determined to be eligible for listing on the National Register of Historic Places. The Ohio SHPO concurred with LM's determination.

- Grand Junction, Colorado, site (a D&D site): LM continued to provide ongoing support to the property owner, Riverview Technology Corporation, for the rehabilitation of a log cabin. One of the oldest buildings at the site, the log cabin was used by MED during World War II and AEC during the Cold War. The cabin is being rehabilitated into an interpretive center where visitors can learn about the site's historic missions and LM's current activities.

5.6 Summary of Environmental Notices

This subsection identifies unique instances of noncompliance and enforcement actions (e.g., notices of violation, notices of deficiency, and environmental occurrences) related to operations and activities at sites under LM's management.

- During the reporting period there were no violations.

Environmental notices received are listed below:

- The Utah Department of Environmental Quality issued a Notice of Deficiency in November 2017 regarding two errors on a Uniform Low-Level Radioactive Waste Manifest generated for the Rocky Flats Site. The notification required the filing of an Occurrence Reporting and Processing System report submitted in December 2017.
- On November 1, 2017, the Fernald Preserve experienced a leak from the CAWWT backwash basin during the Waste Water Treatment Optimization project. The release required submittal of a Non-compliance Notification for Bypasses and Upsets form to Ohio EPA.

6.0 Additional Natural and Cultural Resources Management

In addition to the actions taken under specific regulations, as listed above in Section 5.5, LM completes the following activities for natural and cultural resources management:

- On May 19, 2015, the secretary of the U.S. Department of Agriculture and the administrator of EPA, on behalf of the Pollinator Health Task Force, issued the *National Strategy to Promote the Health of Honey Bees and Other Pollinators*. Developed through a collaborative effort across the executive branch, this strategy outlines a comprehensive approach to tackling and reducing the impact of multiple stressors on pollinator health, including pests and pathogens, reduced habitat, lack of nutritional resources, and exposure to pesticides. LM formed a group to assess pollinator health and potential efforts to reduce pollinator stressors at LM sites.
- LM's Ecosystem Management Team tracks the acreage and types of pollinator-friendly BMPs implemented at LM sites between May 1 of each year and April 30 of the following year. In April 2017, the *Office of Legacy Management Sites Pollinator Health Best Management Practices* report documented the implementation of BMPs over 2564 acres of land since land management activities began in the late 1990s.

- LM annually renews the following permits:
 - Scientific Collecting Permit for wild animals at the Fernald Preserve issued by the Ohio Department of Natural Resources.
 - Special-Purpose Salvage Permit for the Fernald Preserve issued by the USFWS.

7.0 Summary of Groundwater Protection Program

There are 41 LM sites with a groundwater protection program consisting of monitoring chemical and radiological constituents. For each site the monitoring requirements, number of DOE-owned wells, frequency of sampling, and contaminants of concern (COC) are site-specific. For example, some sites are sampled annually and others are sampled every 2, 3, or 5 years. Twenty LM sites have wells defined as point of compliance (POC) wells (i.e., wells at which regulatory standards apply). Exceedances of regulatory standards were reported for eleven of the sites with POC wells sampled during the reporting period. Reports discussing COC exceedances at POC wells are referenced in Table A-4 footnotes and are available on the LM public website.

Table A-4 summarizes the site-specific groundwater monitoring program for applicable LM sites by presenting the following information:

- Whether the site is regularly sampled for radiological analytes (including uranium isotopes).
- Whether the site is regularly sampled for nonradiological analytes (including elemental uranium).
- A list of the COCs.
- The number of active DOE-owned monitoring wells sampled for groundwater monitoring purposes.
- The number of DOE-owned POC wells.
- COC exceedances at POC wells sampled during the reporting period.

8.0 Summary of Environmental Radiation Protection Program

LM's Radiation Protection Program (RPP) implements the requirements necessary to ensure radiological operations at LM sites and facilities are protective of employees, the public, and the environment. The implementing documents of the RPP include the *Radiation Protection Program Plan* (LMS/POL/S04373) and the *Radiological Control Manual* (LMS/POL/S04322). The purpose of the *Radiation Protection Program Plan* is to implement the requirements of 10 CFR 835, "Occupational Radiation Protection." The *Radiological Control Manual* further defines the contractor's LM-specific radiological control responsibilities. LM also ensured compliance with DOE Order 5400.5 Chg 2, *Radiation Protection of the Public and the Environment*. This order was canceled and replaced by DOE Order 458.1 (currently Chg 3), *Radiation Protection of the Public and the Environment*. In July 2016, the LMS contract was

modified to replace the canceled DOE Order 5400.5 Chg 2 with DOE Order 458.1, which the LMS contractor began implementing.

LM uses the RPP at all LM sites and on all activities to ensure radiation exposure to workers and the public and releases of radioactivity to the environment are maintained below regulatory limits and are as low as reasonably achievable. Environmental cleanup at LM sites was completed according to all applicable statutes and regulations, and LM conducts LTS&M to verify site conditions have not changed and established institutional controls remain effective. There were no unplanned radiological discharges in 2017.

8.1 Clearance of Property

This section provides a summary of the property (real and personal) clearance activities for LM, including application of authorized limits, the type of material or property, and the expected end-use scenario (i.e., disposal, recycle, and reuse). DOE Order 458.1 requires annual reporting of the clearance of property.

The clearance of property from an LM site or project location is performed in accordance with the *Radiological Control Manual*. As such, surface contamination limits identified in Table 2 (derived from 10 CFR 835 Appendix D) of the *Radiological Control Manual* are considered preapproved authorized limits. The *Radiological Control Manual* (in accordance with 10 CFR 835) identifies annual dose limits to members of the public to be 100 milliroentgen equivalent man (mrem) to the whole body, 1500 mrem to the lens of the eye, and 5000 mrem to the skin and extremities. These annual dose limits are considered preapproved authorized limits. Temporary dose limits and their requirements listed in DOE Order 458.1 were determined to be not applicable for LM activities. The airborne radioactivity control limits of the *Radiological Control Manual* are also considered preapproved authorized limits.

- No property (real or personal) was cleared from LM sites in 2017.

9.0 Summary of Fire Protection Management and Planning

Wildland fire management plans are in place for the LM sites listed below. These plans describe the current site-specific fire environment and fire prevention and mitigation strategies to meet the fire protection objectives of DOE Order 420.1C Chg 1, Facility Safety. This includes compliance with the following standards of the National Fire Protection Association (NFPA): Standard 1143, *Standard for Wildland Fire Management* (NFPA 2014), and Standard 299, *Standard for Protection of Life and Property from Wildfire* (NFPA 1997). Wildland fire management strategies implemented include use of fire protection equipment, vegetation management, site access controls, job safety analyses, and prescribed burns. The Fernald Preserve and the Weldon Spring site conducted prescribed burns during the reporting period.

LM sites with wildland fire management plans include:

- Fernald Preserve
- Grand Junction disposal site
- Monticello disposal and processing sites

- Rocky Flats Site
- Tuba City, Arizona, Disposal Site
- Weldon Spring site

10.0 Summary of Quality Assurance

LM and the LMS contractor have implemented Quality and Performance Assurance (Q&PA) programs to perform work in a compliant manner and consistently meet or exceed mission objectives while minimizing potential hazards to the environment, the public, and workers. The management systems incorporate the requirements of DOE Order 414.1D, *Quality Assurance*, using ISO standard 9001:2015, *Quality Management Systems–Requirements*, as the chosen national standard.

LM performs oversight of its programs, processes, and contractors as required by DOE Order 226.1B, *Implementation of Department of Energy Oversight Policy*, to ensure programs are achieving their intended results and outputs in a safe and efficient manner.

The Q&PA management systems ensure requirements are identified and integrated into LM procedures and work activities are adequately described in documents such as statements of work, project-specific work plans, procedures, and other documented control measures. Assessments are performed to confirm compliance and evaluate LM and LMS contractor performance. Assessments are planned and recorded according to an annual schedule, and identified issues are tracked in the Corrective Action Tracking System. The annual assessment schedule includes:

- External assessments conducted by DOE, program sponsors, other regulatory agencies, corporate personnel, and external agencies to ensure adequate management system implementation.
- Independent assessments conducted by Q&PA staff independent of the area or function being assessed.
- Management assessments conducted by LM or LMS contractor staff as self-assessments and surveillances.

The Q&PA program includes the identification and control of items and equipment for sampling control and analysis. Additional site-specific requirements for sampling activities at LM sites are defined in the *Sampling and Analysis Plan for the U.S. Department of Energy Office of Legacy Management Sites*, also called the LM Sampling and Analysis Plan (LMS/PRO/S04351). This document provides detailed procedures for sampling environmental media in a consistent and technically defensible manner. These procedures are reviewed annually and updated as required to ensure the most up-to-date processes are used.

Guidelines for evaluating sample collection and field measurement activities against the requirements found in the LM Sampling and Analysis Plan are detailed in the Standard Practice for Validation of Environmental Data in the *Environmental Procedures Catalog* (LMS/POL/S04325). Field quality assurance processes include:

- Following the procedures discussed in the LM Sampling and Analysis Plan.
- Collecting and analyzing quality control samples, including field duplicates, equipment blanks, and trip blanks.
- Inspecting and maintaining monitoring wells.

Soil and surface water samples are also collected for the DRUM Program in accordance with the *Defense-Related Uranium Mines Quality Assurance Program Plan* (LMS/DRM/S15867). Procedures for sampling and analysis are in the *Defense-Related Uranium Mines Verification and Validation Work Plan* (LMS/DRM/S13690).

Validation of environmental data is performed to determine if data meet the specific technical and quality criteria established in the applicable quality system documents and to establish the usability and extent of bias of any data not meeting those criteria. Validation can include evaluation of all activities impacting data quality. The Standard Practice for Validation of Environmental Data includes guidelines for evaluating laboratory analyses against the requirements found in the referenced analytical procedures, the statement of work, and *Quality Systems for Analytical Services*, which is prepared and maintained by the DOE Consolidated Audit Program (DOECAP).

LM utilizes contracted analytical laboratories and treatment, storage, and disposal facilities (TSDF) when required and ensures these providers participate in DOECAP or the Mixed Analyte Performance Evaluation Program. Table 1 lists all contracted analytical laboratories and a TSDF utilized in 2017.

Table 1: Contracted Analytical Laboratories and TSDFs

Laboratory	Location
GEL Laboratories, LLC	2040 Savage Road Charleston, SC 29407
Test America	13715 Rider Trail North Earth City, MO 63045
Paragon Analytics	225 Commerce Drive Fort Collins, CO 80524
Sanford Cohen & Associates	1608 Spring Hill Rd Suite 400 Vienna, VA 22182
ALS Global+ (Formerly Paragon Analytics)	225 Commerce Drive Fort Collins, CO 80524
ARS International, LLC	2609 North River Road Port Allen, LA 70791
Test America Laboratories Inc.	4995 Yarrow Street Arvada, CO 80002
TSDF	Location
EnergySolutions Clive Disposal Facility	Interstate 80, Exit 49 Clive, UT 84029

Appendix A

Legacy Management Sites and Related Reports and Summary of Groundwater Monitoring Program

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Table A-1: Category 1 Sites
(Typically involves records-related activities and stakeholder support)

CERCLA/RCRA Sites
Maxey Flats, KY, Disposal Site https://www.lm.doe.gov/maxey_flats/Sites.aspx
Nevada Offsites
Chariot, AK, Site https://www.lm.doe.gov/Chariot/Sites.aspx
FUSRAP Sites
Acid/Pueblo Canyon, NM, Site https://www.lm.doe.gov/Acid/Sites.aspx
Adrian, MI, Site https://www.lm.doe.gov/Adrian/Sites.aspx
Albany, OR, Site https://www.lm.doe.gov/Albany/Sites.aspx
Aliquippa, PA, Site https://www.lm.doe.gov/Aliquippa/Sites.aspx
Berkeley, CA, Site https://www.lm.doe.gov/berkeley/Sites.aspx
Beverly, MA, Site https://www.lm.doe.gov/beverly/Sites.aspx
Buffalo, NY, Site https://www.lm.doe.gov/buffalo/Sites.aspx
Chicago North, IL, Site https://www.lm.doe.gov/chicago_north/Sites.aspx
Chicago South, IL, Site https://www.lm.doe.gov/chicago_south/Sites.aspx
Chupadera Mesa, NM, Site https://www.lm.doe.gov/chupadera/Sites.aspx
Columbus East, OH, Site https://www.lm.doe.gov/columbus_east/Sites.aspx
Fairfield, OH, Site https://www.lm.doe.gov/fairfield/Sites.aspx
Granite City, IL, Site https://www.lm.doe.gov/granite_city/Sites.aspx
Hamilton, OH, Site https://www.lm.doe.gov/hamilton/Sites.aspx
Indian Orchard, MA, Site https://www.lm.doe.gov/indian_orchard/Sites.aspx
Jersey City, NJ, Site https://www.lm.doe.gov/jersey_city/Sites.aspx
Madison, IL, Site https://www.lm.doe.gov/madison/Sites.aspx
New York, NY, Site https://www.lm.doe.gov/new_york/Sites.aspx
Niagara Falls Storage Site Vicinity Properties, NY, Site https://www.lm.doe.gov/niagara/vicinity/Sites.aspx
Oak Ridge, TN, Warehouses Site https://www.lm.doe.gov/oakridge/Sites.aspx
Oxford, OH, Site https://www.lm.doe.gov/oxford/Sites.aspx
Seymour, CT, Site https://www.lm.doe.gov/seymour/Sites.aspx
Springdale, PA, Site https://www.lm.doe.gov/springdale/Sites.aspx
Toledo, OH, Site https://www.lm.doe.gov/toledo/Sites.aspx
Tonawanda North, NY, Site Unit 1 https://www.lm.doe.gov/tonawanda/Sites.aspx
Tonawanda North, NY, Site Unit 2 https://www.lm.doe.gov/tonawanda/Sites.aspx
Wayne, NJ, Site https://www.lm.doe.gov/wayne/Sites.aspx

Table A-1: Category 1 Sites (continued)
 (Typically involves records-related activities and stakeholder support)

MED/AEC Legacy Sites
Ashtabula, OH, Site https://www.lm.doe.gov/Ashtabula/Sites.aspx
Center for Energy and Environmental Research, PR, Site https://www.lm.doe.gov/CEER/Sites.aspx
Columbus, OH, Site https://www.lm.doe.gov/Columbus/Sites.aspx
El Verde, PR, Site https://www.lm.doe.gov/El_Verde/Sites.aspx
General Atomics Hot Cell Facility, CA, Site https://www.lm.doe.gov/general_atomic/Sites.aspx
Inhalation Toxicology Laboratory, NM, Site https://www.lm.doe.gov/ITL/Sites.aspx
Missouri University Research Reactor, MO, Site https://www.lm.doe.gov/MURR/Sites.aspx
Oxnard, CA, Site https://www.lm.doe.gov/oxnard/Sites.aspx
Vallecitos Nuclear Center, CA, Site https://www.lm.doe.gov/Vallecitos/Sites.aspx
SWQS Site
Geothermal Test Facility, CA, Site https://www.lm.doe.gov/geothermal/Sites.aspx

Table A-2: Category 2 Sites

(Typically involves routine inspection and maintenance, records-related activities, and stakeholder support)

Site Name	Type of Data Collected					Where Data Are Reported					
	Inspection	Groundwater and/or Surface Water Monitoring	Production Water and Gas Monitoring	Chemical Inventory ^a	Other Environmental Monitoring (biological, soil, etc.)	Site Inspection Report	CERCLA Five-Year Review Report	Annual Site Inspection and Monitoring Report for UMTRCA Title I or Title II Sites	Environmental Monitoring Report ^b	EPCRA Report ^a	GEMS ^c
CERCLA/RCRA Sites											
Laboratory for Energy-Related Health Research, CA, Site https://www.lm.doe.gov/LEHR/Sites.aspx	x	x				x	x		x		x
Nevada Offsites											
Amchitka, AK, Site https://www.lm.doe.gov/Amchitka/Sites.aspx	x				x	x			x		x
Central Nevada Test Area, NV, Site https://www.lm.doe.gov/CNTA/Sites.aspx	x	x				x			x		x
Gasbuggy, NM, Site https://www.lm.doe.gov/Gasbuggy/Sites.aspx		x	x						x		x
Gnome-Coach, NM, Site https://www.lm.doe.gov/Gnome/Sites.aspx	x	x				x			x		x
Rio Blanco, CO, Site https://www.lm.doe.gov/Rio_Blanco/Sites.aspx		x	x						x		x
Rulison, CO, Site https://www.lm.doe.gov/Rulison/Sites.aspx		x	x						x		x
Salmon, MS, Site https://www.lm.doe.gov/salmon/Sites.aspx		x							x		x
Shoal, NV, Site https://www.lm.doe.gov/Shoal/Sites.aspx	x	x				x			x		x
UMTRCA Sites											
Ambrosia Lake, NM, Disposal Site https://www.lm.doe.gov/Ambrosia/Sites.aspx	x	x						x			x
Bluewater, NM, Disposal Site https://www.lm.doe.gov/bluewater/Sites.aspx	x	x						x			x
Burrell, PA, Disposal Site https://www.lm.doe.gov/burrell/Sites.aspx	x	x						x	x		x
Canonsburg, PA, Disposal Site https://www.lm.doe.gov/canonsburg/Sites.aspx	x	x						x	x		x
Durango, CO, Processing Site https://www.lm.doe.gov/Durango/Processing/Sites.aspx		x							x		x
Durango, CO, Disposal Site https://www.lm.doe.gov/Durango/Disposal/Sites.aspx	x	x						x			x
Edgemont, SD, Disposal Site https://www.lm.doe.gov/edgemont/Sites.aspx	x							x			x
Falls City, TX, Disposal Site https://www.lm.doe.gov/falls/Sites.aspx	x	x						x			x
Green River, UT, Disposal Site https://www.lm.doe.gov/green_river/Sites.aspx	x	x						x			x

Table A-2: Category 2 Sites (continued)

(Typically involves routine inspection and maintenance, records-related activities, and stakeholder support)

Site Name	Type of Data Collected					Where Data Are Reported				
	Inspection	Groundwater and/or Surface Water Monitoring	Production Water and Gas Monitoring	Chemical Inventory ^a	Other Environmental Monitoring (biological, soil, etc.)	Site Inspection Report	CERCLA Five-Year Review Report	Annual Site Inspection and Monitoring Report for UMTRCA Title I or Title II Sites	Environmental Monitoring Report ^b	EPCRA Report ^a
UMTRCA Sites (continued)										
Gunnison, CO, Processing Site https://www.lm.doe.gov/Gunnison/Processing/Sites.aspx		x							x	x
Gunnison, CO, Disposal Site https://www.lm.doe.gov/Gunnison/Disposal/Sites.aspx	x	x					x	x		x
Lakeview, OR, Processing Site https://www.lm.doe.gov/Lakeview/Processing/Sites.aspx		x								x
Lakeview, OR, Disposal Site https://www.lm.doe.gov/Lakeview/Disposal/Sites.aspx	x	x			x		x			x
L-Bar, NM, Disposal Site https://www.lm.doe.gov/Lbar/Sites.aspx	x	x			x		x			x
Lowman, ID, Disposal Site https://www.lm.doe.gov/lowman/Sites.aspx	x						x			x
Maybell, CO, Disposal Site https://www.lm.doe.gov/Maybell/Sites.aspx	x						x			x
Maybell West, CO, Disposal Site https://www.lm.doe.gov/Maybell_West/Sites.aspx	x						x			x
Mexican Hat, UT, Disposal Site https://www.lm.doe.gov/Mexican_Hat/Sites.aspx	x				x		x			x
Monument Valley, AZ, Processing Site https://www.lm.doe.gov/MonValley/Sites.aspx		x			x			x		x
Naturita, CO, Processing Site https://www.lm.doe.gov/Naturita/Processing/Sites.aspx		x								x
Naturita, CO, Disposal Site https://www.lm.doe.gov/Naturita/Disposal/Sites.aspx	x						x			x
Rifle, CO, Processing (Old) Site https://www.lm.doe.gov/Rifle/Old_Processing/Sites.aspx		x						x		x
Rifle, CO, Processing (New) Site https://www.lm.doe.gov/Rifle/New_Processing/Sites.aspx		x						x		x
Rifle, CO, Disposal Site https://www.lm.doe.gov/Rifle/Disposal/Sites.aspx	x	x					x	x		x
Riverton, WY, Processing Site https://www.lm.doe.gov/Riverton/Sites.aspx		x						x		x
Salt Lake City, UT, Processing Site https://www.lm.doe.gov/Salt_Lake/Processing/Sites.aspx										x
Salt Lake City, UT, Disposal Site https://www.lm.doe.gov/Salt_Lake/Disposal/Sites.aspx	x						x			x
Sherwood, WA, Disposal Site https://www.lm.doe.gov/sherwood/Sites.aspx	x	x			x		x	x		x

Table A-2: Category 2 Sites (continued)

(Typically involves routine inspection and maintenance, records-related activities, and stakeholder support)

Site Name	Type of Data Collected					Where Data Are Reported				
	Inspection	Groundwater and/or Surface Water Monitoring	Production Water and Gas Monitoring	Chemical Inventory ^a	Other Environmental Monitoring (biological, soil, etc.)	Site Inspection Report	CERCLA Five-Year Review Report	Annual Site Inspection and Monitoring Report for UMTRCA Title I or Title II Sites	Environmental Monitoring Report ^b	EPCRA Report ^a
UMTRCA Sites (continued)										
Shirley Basin South, WY, Disposal Site https://www.lm.doe.gov/Shirley_Basin/Sites.aspx	x	x						x		x
Slick Rock, CO, Processing Site https://www.lm.doe.gov/Slick_Rock/Processing/Sites.aspx		x							x	x
Slick Rock, CO, Disposal Site https://www.lm.doe.gov/Slick_Rock/Disposal/Sites.aspx	x							x		x
Spook, WY, Disposal Site https://www.lm.doe.gov/Spook/Sites.aspx	x							x		x
FUSRAP Sites^d										
Bayo Canyon, NM Site https://www.lm.doe.gov/bayo/Sites.aspx										
New Brunswick, NJ, Site https://www.lm.doe.gov/New_Brunswick/Sites.aspx										
Painesville, OH, Site https://www.lm.doe.gov/Painesville/Sites.aspx										
Tonawanda, NY, Site https://www.lm.doe.gov/tonawanda/Sites.aspx										
D&D Sites										
BONUS, PR, Decommissioned Reactor Site https://www.lm.doe.gov/bonus/Sites.aspx	x					x				x
Grand Junction, CO, Site https://www.lm.doe.gov/Grand_Junction/Sites.aspx	x	x		x		x				x
Hallam, NE, Decommissioned Reactor Site https://www.lm.doe.gov/hallam/Sites.aspx	x	x				x			x	x
Piqua, OH, Decommissioned Reactor Site https://www.lm.doe.gov/Piqua/Sites.aspx	x					x				x
Site A/Plot M, IL, Decommissioned Reactor Site https://www.lm.doe.gov/SiteA_PlotM/Sites.aspx	x	x				x			x	x

Table A-2: Category 2 Sites (continued)

(Typically involves routine inspection and maintenance, records-related activities, and stakeholder support)

Site Name	Type of Data Collected					Where Data Are Reported				
	Inspection	Groundwater and/or Surface Water Monitoring	Production Water and Gas Monitoring	Chemical Inventory ^a	Other Environmental Monitoring (biological, soil, etc.)	Site Inspection Report	CERCLA Five-Year Review Report	Annual Site Inspection and Monitoring Report for UMTRCA Title I or Title II Sites	Environmental Monitoring Report ^b	EPCRA Report ^a
Nuclear Waste Policy Act Section 151 Site										
Parkersburg, WV, Disposal Site https://www.lm.doe.gov/parkersburg/Sites.aspx	x	x				x			x	x
MED/AEC Legacy Site										
Burris Park, CA, Site https://www.lm.doe.gov/BurrisPark/Sites.aspx	x					x				

Notes:

^a Certain sites conduct chemical inventories to ensure compliance with EPCRA. EPCRA reports are only required when a chemical is stored in an amount exceeding the associated threshold planning quantity.

^b Types of environmental monitoring reports include:

- Data Validation Packages
- Verification monitoring reports
- Groundwater monitoring reports
- Postclosure inspection and monitoring reports
- Hydrologic and natural gas sampling and analysis reports

^c GEMS (Geospatial Environmental Mapping System): This is a custom, web-based application to gather validated information for sites transferred to LM. Stakeholders, regulators, and project personnel can use GEMS to design interactive tabular reports, graphs, and geospatial displays. Available data include:

- Historical environmental information
- Analytical chemistry data
- Groundwater depths and elevations
- Well logs and well construction data
- Georeferenced boundaries
- Site physical features
- Sampling locations

^d The FUSRAP sites currently do not require LTS&M activities other than periodically assessing site conditions, managing site records, responding to stakeholder inquiries, and maintaining information on site fact sheets and websites.

Table A-3: Category 3 Sites

(Typically involves operation and maintenance of remedial action system, routine inspection and maintenance, records-related activities, and stakeholder support)

Site Name	Type of Data Collected					Where Data Are Reported						
	Inspection	Groundwater and/or Surface Water Monitoring	Discharge Monitoring	Other Environmental Monitoring (biological, soil, etc.)	Chemical Inventory ^a	Site Inspection Report	CERCLA Five-Year Report	Annual Site Inspection and Monitoring Report for UMTRCA Title I or Title II Sites	EPCRA Report ^a	NPDES Report	Environmental Monitoring Report ^b	GEMS ^c
CERCLA/RCRA Sites												
Fernald Preserve, OH, Site ^d https://www.lm.doe.gov/Fernald/Sites.aspx	x	x	x	x	x	x	x			x	x	x
Monticello, UT, Processing Site https://www.lm.doe.gov/Monticello/Sites.aspx	x	x				x	x				x	x
Monticello, UT, Disposal Site https://www.lm.doe.gov/Monticello/Sites.aspx	x	x				x	x				x	x
Mound, OH, Site https://www.lm.doe.gov/Mound/Sites.aspx	x	x	x		x	x	x			x	x	x
Pinellas County, FL, Site https://www.lm.doe.gov/pinellas/Sites.aspx	x	x									x	x
Rocky Flats Site, CO https://www.lm.doe.gov/Rocky_Flats/Sites.aspx	x	x		x	x	x	x		x		x	x
Weldon Spring, MO, Site https://www.lm.doe.gov/Weldon/Sites.aspx	x	x	x		x	x	x			x	x	x
UMTRCA Sites												
Grand Junction, CO, Processing Site https://www.lm.doe.gov/Grand_Junction_DP/Processing/Sites.aspx	x	x				x					x	x
Grand Junction, CO, Disposal Site https://www.lm.doe.gov/Grand_Junction_DP/Disposal/Sites.aspx	x	x			x			x			x	x
Shiprock, NM, Disposal Site https://www.lm.doe.gov/Shiprock/Sites.aspx	x	x						x			x	x
Tuba City, AZ, Disposal Site https://www.lm.doe.gov/Tuba/Sites.aspx	x	x			x			x			x	x

Notes:

^a Certain sites conduct chemical inventories to ensure compliance with EPCRA. EPCRA reports are only required when a chemical is stored in an amount exceeding the associated threshold planning quantity.

^b Types of Environmental Monitoring Reports include:

- Data Validation Packages
- Verification monitoring reports
- Groundwater monitoring reports
- Hydrologic and natural gas sampling and analysis reports
- Federal facility agreement quarterly reports

^c GEMS (Geospatial Environmental Mapping System): This is a custom, web-based application to gather validated information for sites transferred to LM. Stakeholders, regulators, and project personnel can use GEMS to design interactive tabular reports, graphs, and geospatial displays. Available data include:

- Historical environmental information
- Analytical chemistry data
- Groundwater depths and elevations
- Well logs and well construction data
- Georeferenced boundaries
- Site physical features
- Sampling locations

^d This site has an annual Site Environmental Report as required in the *Comprehensive Legacy Management and Institutional Controls Plan* (LMS/FER/S03496). It is available on the site-specific webpage.

Table A-4. Calendar Year 2017 Groundwater Monitoring Program Summary

Site Name	Rad Monitoring ^a	Non-Rad Monitoring ^b	COCs ^c	Active Wells	POC Wells ^d	Exceedance at POC Wells
CERCLA/RCRA Sites						
Fernald Preserve, OH, Site	x	x	Alpha-chlordane, antimony, aroclor-1254, arsenic, barium, beryllium, benzene, bis(2-chloroisopropyl) ether, bis(2-ethylhexyl) phthalate, boron, bromodichloromethane, bromoform, bromomethane, cadmium, carbazole, carbon disulfide, chloroethane, chloroform, chromium(VI), cobalt, copper, fluoride, lead, manganese , mercury, methylene chloride, molybdenum , neptunium-237, nickel, nitrate + nitrite , octachlorodibenzo- <i>p</i> -dioxin, radium-226, radium-228, selenium, silver, strontium-90, technetium-99 , thorium-228, thorium-230, thorium-232, trichloroethene , total uranium , vanadium, vinyl chloride, zinc, 1,1-dichloroethane, 1,1-dichloroethene, 1,2-dichloroethane, 4-methylphenol, 4-nitrophenol, and 2,3,7,8-tetrachlorodibenzo- <i>p</i> -dioxin	179	179	Yes ^e
Monticello, UT, Disposal and Processing Sites	x	x	Arsenic, gross alpha activity, manganese, molybdenum, nitrate, selenium, uranium, vanadium	157	0	N/A
Mound, OH, Site	x	x	Tetrachloroethene, trichloroethene, tritium, vinyl chloride, <i>cis</i> -1,2-dichloroethene, <i>trans</i> -1,2-dichloroethene	54	0	N/A
Pinellas County, FL, Site		x	Benzene, trichloroethene, vinyl chloride, 1,1-dichloroethene, 1,4-dioxane, <i>cis</i> -1,2-dichloroethene, <i>trans</i> -1,2-dichloroethene	142	0	N/A
Rocky Flats Site, CO	x	x	Volatile organic compounds, semi-volatile organic compounds, metals, plutonium, americium, uranium, nitrate (for a detailed list of COCs, see the site webpage)	88	0	N/A
Weldon Spring, MO, Site	x	x	Nitrate, nitrobenzene, trichloroethene, uranium, 1,3-dinitrobenzene, 2,4-dinitrotoluene, 2,6-dinitrotoluene, 2,4,6-trinitrotoluene	106	0	N/A
Nevada Offsites						
Central Nevada Test Area, NV	x		Carbon-14, iodine-129, tritium	10	9	No
Gasbuggy, NM, Site	x		Gamma-emitting nuclides, tritium	5	0	N/A
Gnome-Coach, NM, Site	x		Cesium-137, strontium-90, tritium	5	0	N/A
Rio Blanco, CO, Site	x		Gamma-emitting nuclides, tritium	4	0	N/A
Rulison, CO, Site	x		Gamma-emitting nuclides, tritium	1	0	N/A
Salmon, MS, Site	x	x	Arsenic, barium, chromium, <i>cis</i> -1,2-dichloroethene, lead, trichloroethene, tritium, vinyl chloride	32	0	N/A
Shoal, NV, Site	x	x	Carbon-14, iodine-129, tritium	13	9	No

Table A-4. Calendar Year 2017 Groundwater Monitoring Program Summary (continued)

Site Name	Rad Monitoring ^a	Non-Rad Monitoring ^b	COCs ^c	Active Wells	POC Wells ^d	Exceedance at POC Wells
UMTRCA Sites						
Ambrosia Lake, NM, Disposal Site		x	Molybdenum, nitrate + nitrite as nitrogen, selenium, sulfate, uranium	3	0	N/A
Bluewater, NM, Disposal Site		x	Molybdenum, polychlorinated biphenyls, selenium, uranium	19	5	No
Burrell, PA, Disposal Site		x	Calcium, chloride, iron, lead, magnesium, manganese, molybdenum, nitrate as nitrogen, potassium, selenium, sodium, sulfate, total dissolved solids, uranium	8	0	N/A
Canonsburg, PA, Disposal Site		x	Uranium	5	3	No
Durango, CO, Disposal Site		x	Molybdenum, selenium, uranium	7	3	No
Durango, CO, Processing Site		x	Cadmium, manganese, molybdenum, selenium, sulfate, uranium	13	8	Yes ^f
Falls City, TX, Disposal Site		x	Uranium	12	0	N/A
Grand Junction, CO, Disposal Site		x	Molybdenum, nitrate as nitrogen, polychlorinated biphenyls, selenium, sulfate, total dissolved solids, uranium, vanadium	3	0	N/A
Grand Junction, CO, Processing Site		x	Ammonia (as NH ₄), molybdenum, uranium	4	0	N/A
Green River, UT, Disposal Site		x	Nitrate, sulfate, uranium	18	4	Yes ^g
Gunnison, CO, Disposal Site		x	Calcium, chloride, iron, magnesium, manganese, potassium, sodium, sulfate, total dissolved solids, uranium	16	6	No
Gunnison, CO, Processing Site		x	Manganese, uranium	28	26	Yes ^h
Lakeview, OR, Disposal Site		x	Arsenic, cadmium, uranium	9	8	No
L-Bar, NM, Disposal Site		x	Chloride, nitrate + nitrite as nitrogen, selenium, sulfate, total dissolved solids, uranium	10	4	No
Monument Valley, AZ, Processing Site		x	Nitrate, sulfate, uranium	53	0	N/A
Naturita, CO, Processing Site		x	Arsenic, uranium, vanadium	8	4	No
Rifle, CO Processing (New) Site		x	Arsenic, molybdenum, nitrate as nitrogen, selenium, uranium, vanadium	16	4	Yes ⁱ
Rifle, CO Processing (Old) Site		x	Selenium, uranium, vanadium,	8	8	Yes ^j
Riverton, WY, Processing Site		x	Manganese, molybdenum, sulfate, uranium	56	55	Yes ^k
Sherwood, WA, Disposal Site		x	Chloride, sulfate, total dissolved solids	3	0	N/A
Shiprock, NM, Disposal Site		x	Ammonium, manganese, nitrate, selenium, strontium, sulfate, uranium	128	0	N/A
Shirley Basin South, WY, Disposal Site	x	x	Cadmium, chromium, lead, nickel, radium-226, radium-228 , selenium, thorium-230, uranium	14	4	Yes ^l
Slick Rock, CO, Processing Site	x	x	Benzene, manganese, molybdenum, nitrate, radium-226, radium-228, selenium, toluene, uranium	13	13	Yes ^m
Tuba City, AZ, Disposal Site		x	Molybdenum, nitrate, selenium, uranium	124	124	Yes ⁿ

Table A-4. Calendar Year 2017 Groundwater Monitoring Program Summary (continued)

Site Name	Rad Monitoring ^a	Non-Rad Monitoring ^b	COCs ^c	Active Wells	POC Wells ^d	Exceedance at POC Wells
D&D Sites						
Grand Junction, CO, Site		x	Manganese, molybdenum , selenium , sulfate, uranium	7	7	Yes ^o
Hallam, NE, Decommissioned Reactor Site	x	x	Gamma-emitting nuclides, gross alpha, gross beta, nickel-63, tritium, uranium	19	0	N/A
Site A/Plot M, IL, Decommissioned Reactor Site	x		Strontium-90, tritium	19	0	N/A
Nuclear Waste Policy Act Section 151 Site						
Parkersburg, WV, Disposal Site	x	x	Antimony, barium, beryllium, cadmium, calcium, chloride, chromium, gross alpha, gross beta, lead, magnesium, mercury, nickel, nitrate + nitrite, potassium, radium-226, radium-228, selenium, sodium, sulfate, thallium, thiocyanate, uranium, zirconium	6	0	N/A

Notes:

- ^a Rad monitoring refers to groundwater sampling for radiological analytes (including uranium isotopes).
- ^b Non-rad monitoring refers to groundwater sampling for nonradiological analytes (including elemental uranium).
- ^c COCs exceeding applicable standards at POC wells during the reporting year are in **bold** type.
- ^d For the purposes of this report, a POC well is an active monitoring well at which regulatory standards apply.

Reports documenting COC exceedances:

- COCs may be exceeded at POC wells without a resultant violation; violations are conditional to the regulatory framework for each site. See the site-specific documents listed below for more information on the exceedances (available at <https://www.energy.gov/lm/sites/lm-sites>).
- ^e Fernald, OH, Site: *Fernald Preserve 2017 Site Environmental Report* (May 2018).
 - ^f Durango, CO, Processing Site: Durango Processing Site Mapping and Monitoring available at GEMS (<https://gems.lm.doe.gov/#site=DUP>).
 - ^g Green River, UT, Disposal Site: *2017 Annual Site Inspection and Monitoring Report for Uranium Mill Tailings radiation Control Act Title I Disposal Sites* (March 2018).
 - ^h Gunnison, CO, Processing Site: *2017 Verification Monitoring Report for the Gunnison, Colorado, Processing Site* (estimated September 2018).
 - ⁱ Rifle, CO, Processing (New) Site: Rifle New Processing Site Mapping and Monitoring available at GEMS (<https://gems.lm.doe.gov/#site=RFN>).
 - ^j Rifle, CO, Processing (Old) Site: Rifle Old Processing Site Mapping and Monitoring available at GEMS (<https://gems.lm.doe.gov/#site=RFO>).
 - ^k Riverton, WY, Processing Site: Riverton Processing Site Mapping and Monitoring available at GEMS (<https://gems.lm.doe.gov/#site=RVT>).
 - ^l Shirley Basin South, WY, Disposal Site: *2017 Annual Site Inspection and Monitoring Report for Uranium Mill Tailings Radiation Control Act Title II Disposal Sites* (December 2017).
 - ^m Slick Rock, CO, Processing Site: *2017 Verification Monitoring Report for the Slick Rock, Colorado, Processing Sites* (estimated September 2018).
 - ⁿ Tuba City, AZ, Disposal Site: *2017 Annual Site Inspection and Monitoring Report for Uranium Mill Tailings Radiation Control Act Title I Disposal Sites* (March 2018).
 - ^o Grand Junction, CO, Site: *Data Validation Package February 2017 Groundwater and Surface Water Sampling at the Grand Junction, Colorado, Site* (May 2017).

Abbreviation:

N/A: not applicable