Department of Energy
Washington, DC 20585

MEMORANDUM FOR JOSH SILVERMAN, Ph.D, DIRECTOR
OFFICE OF ENVIRONMENTAL PROTECTION AND
ES&H REPORTING
OFFICE OF ENVIRONMENT, HEALTH, SAFETY AND
SECURITY

FROM: DAVID S. SHAFER, Ph.D., DEPUTY DIRECTOR
OFFICE OF FIELD OPERATIONS, LM-20
OFFICE OF LEGACY MANAGEMENT

David S. Shafer, PHD

SUBJECT: Annual Site Environmental Reporting for Department of Energy Office of Legacy management Sites (2019)

The U.S. Department of Energy Office of Legacy Management (LM) is submitting the attached *Summary of Annual Site Environmental Reports Calendar Year 2019* to meet the intent of DOE Order 231.1B with a scaled-down approach as identified in the Annual Site Environmental Report (ASER) preparation guidance. LM is committed to ensuring environmental protection, compliance, and sustainability in the performance of our mission, vision, and operating principles.

Please contact Tracy Ribeiro at (303) 410-4817, or Tracy.Ribeiro@lm.doe.gov, if you have any questions.

Attachment

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File: FED/20/38

Summary of Annual Site Environmental Reports Calendar Year 2019

LMS/S14598

OFFICE OF LEGACY MANAGEMENT
Commitment to Stewardship

Cover photo captions:

Top Left: The Fernald Preserve, Ohio, Site received the 2019 U.S. Environmental Protection Agency National Federal Facility Excellence in Site Reuse Award in the National Priorities List category. The award recognizes accomplishments in environmental education, environmental remediation, and conservation of natural resources at the Fernald Preserve.

Middle Left: Overview of a representative mine site that is managed under the Defense-Related Uranium Mines (DRUM) Program. In 2019, staff completed reconciliation, inventory, and field verification and validation of 571 DRUM Program mines in Colorado, New Mexico, South Dakota, Utah, and Wyoming.

Bottom Left: At the Canonsburg, Pennsylvania, Disposal Site, the North Terrace Erosion Repair Project repaired approximately 1200 linear feet of stream bank along Chartiers Creek. Revegetation of the area included the planting of a forest riparian buffer strip to further protect the area north of the disposal cell against future erosion due to flooding events.

Bottom Right: Overview of the Durango, Colorado, Disposal Site, which is one of 21 sites managed by the U.S. Department of Energy Office of Legacy Management (LM) in accordance with Title I of the Uranium Mill Tailings Radiation Control Act. LM responsibilities include long-term routine inspections, maintenance, records management, and stakeholder support.

Public and Stakeholder Feedback

For more information on LM activities or to provide comments and feedback on the content of this report, contact:

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Abbreviations

AEA	Atomic Energy Act
AEC	U.S. Atomic Energy Commission
ALARA	as low as reasonably achievable
ARAR	applicable or relevant and appropriate requirement
ASER	Annual Site Environmental Report
AS&T	Applied Studies and Technology
BLM	U.S. Bureau of Land Management
BMP	best management practice
CAA	Clean Air Act
CAWWT	Converted Advanced Waste Water Treatment
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	*Code of Federal Regulations*
COC	contaminant of concern
CWA	Clean Water Act
CXE	Categorical Exclusion Evaluation
D&D	Decontamination and Decommissioning
DOE	U.S. Department of Energy
DRUM	Defense-Related Uranium Mines
EA	Environmental Assessment
EISA	Energy Independence and Security Act
EM	Office of Environmental Management
EMS	Environmental Management System
EO	Executive Order
EPA	U.S. Environmental Protection Agency
EPCRA	Emergency Planning and Community Right-to-Know Act of 1986
EPEAT	Electronic Product Environmental Assessment Tool
ESA	Endangered Species Act
FFCA	Federal Facility Compliance Agreement
FIFRA	Federal Insecticide, Fungicide, and Rodenticide Act
FUSRAP	Formerly Utilized Sites Remedial Action Program
FY	fiscal year
GCAP	Groundwater Compliance Action Plan
HSWA	Hazardous and Solid Waste Amendments

ISO	International Organization for Standardization
LLRW	low-level radioactive waste
LM	Office of Legacy Management
LMBC	Legacy Management Business Center
LMNLN	Legacy Management National Laboratory Network
LMS	Legacy Management Support
LTS&M	long-term surveillance and maintenance
MBTA	Migratory Bird Treaty Act
MED	Manhattan Engineer District
MSD	Metropolitan St. Louis Sewer District
NEPA	National Environmental Policy Act
NESHAPs	National Emission Standards for Hazardous Air Pollutants
NHPA	National Historic Preservation Act
NPDES	National Pollutant Discharge Elimination System
NRC	U.S. Nuclear Regulatory Commission
NWPA	Nuclear Waste Policy Act
ODNR	Ohio Department of Natural Resources
PFAS	polyfluorinated alkyl substances
PFOA	perfluorooctanoic acid
PFOS	perfluorooctanesulfonic acid
POC	point of compliance
QAPP	Quality Assurance Project Plan
Q&PA	Quality and Performance Assurance
RCRA	Resource Conservation and Recovery Act
RPP	Radiation Protection Program
SAP	Sampling and Analysis Plan
SARA	Superfund Amendments and Reauthorization Act
SDWA	Safe Drinking Water Act
SHPO	State Historic Preservation Officer
SPCC	Spill Prevention, Control, and Countermeasure
THPO	Tribal Historic Preservation Officer
TSCA	Toxic Substances Control Act
TSDF	treatment, storage, and disposal facility
ULP	Uranium Leasing Program

UMTRCA	Uranium Mill Tailings Radiation Control Act
USACE	U.S. Army Corps of Engineers
USC	*United States Code*
USFWS	U.S. Fish and Wildlife Service
VOC	volatile organic compound
V&V	verification and validation

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 the reporting requirements specified in Attachment 2 of the order. The ASER is submitted to the Office of Environmental Protection and Environment, Safety and Health Reporting annually and is available to the public. DOE's April 2020 *Guidance for the Preparation of the 2019 Department of Energy Annual Site Environmental Reports* recognizes that 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 2019. When practical, this report provides website links where documents are publicly accessible. The links may go to the most recent document versions rather than those in effect for the ASER reporting period.

1.1 Public and Stakeholder Outreach and Feedback

In 2019, LM shared a Stakeholder Satisfaction Survey that evaluated LM's communication, education, and outreach efforts to assess areas where communication with the public and stakeholders can be improved. To address feedback, LM plans to continue its community engagement efforts and increase proactive communications outreach. The 2019 survey is available at https://www.energy.gov/lm/articles/us-department-energy-office-legacy-management-lm-2019-stakeholder-survey-research.

This ASER provides stakeholders and the public a description of the environmental conditions and regulatory compliance status at LM sites and of LM's programmatic environmental activities. LM welcomes feedback and is committed to continuous improvement of environmental activities and this document.

Contact LM@hq.doe.gov for more information on LM activities or to provide comments and feedback on the content of this report.

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 through long-term surveillance and maintenance (LTS&M). The histories of the legacy sites vary, as do the regulatory regimes under which the sites are managed. Publicly available LTS&M plans or equivalent documents are prepared for the sites and include site descriptions, site histories, the nature and extent of contamination, site closeout conditions, present and future monitoring and surveillance programs, and institutional controls. In 2019, LM managed the long-term care of 100 sites. The regulatory or programmatic framework and the number of sites managed under each framework during the reporting period are described below and on the DOE website at

https://energy.gov/lm/sites/lm-sites/programmatic-framework. Site counts are updated annually in the LM *Site Management Guide*; this ASER was aligned with the March 2020 guide, which is available at https://www.energy.gov/lm/downloads/site-management-guide. Table 1 provides a summary of the site counts. As active remediation of additional DOE sites is completed, they will be transferred to LM for long-term care.

2.1 CERCLA/RCRA Sites

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

2.2 Nevada Offsites

LM managed nine sites during the reporting period under the Nevada Offsites Program, including sites where underground nuclear tests and experiments were performed outside of the Nevada National Security Site (formerly called 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 and Consent Order, and the remaining seven sites are managed in collaboration with each host state's environmental agency.

2.3 UMTRCA Sites

The Uranium Mill Tailings Radiation Control Act (UMTRCA) (Title 42 *United States Code* Section 7901 [42 USC 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. The responsibility for remediation was assigned to DOE. Uranium mill tailings and associated contaminated material are stored in disposal cells on some Title I sites. LM managed 21 UMTRCA Title I sites during the reporting period.
- Title II of UMTRCA identified the decommissioning, reclamation, and long-term surveillance requirements for uranium mill sites under specific license on or after January 1, 1978. These sites were commercially owned and regulated under U.S. Nuclear Regulatory Commission (NRC) license. Once the owner completes NRC-approved reclamation, DOE accepts title to the site for long-term custody and care. LM managed six reclaimed UMTRCA Title II sites during the reporting period; the number will increase as additional 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. Congress transferred responsibility for investigation and remediation of FUSRAP sites from DOE to USACE with the Energy and Water Development Appropriations Act for fiscal year (FY) 1998. Remediation is subject to the administrative, procedural, and regulatory provisions of CERCLA and the National Oil and Hazardous Substances Pollution Contingency Plan.

USACE retains responsibility for each site for 2 years after remediation is complete 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 may be limited to managing site records and responding to stakeholder inquiries. LM managed 34 FUSRAP sites during the reporting period; the number will increase as USACE completes the cleanup of remaining sites.

2.5 D&D Sites

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

2.6 NWPA Section 151 Site

Under the NRC Site Decommissioning Management Program, owners can transfer certain sites with low-level radioactive contamination after site remediation 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 Manhattan Engineer District/U.S. Atomic Energy Commission (MED/AEC) Legacy Sites

MED/AEC sites were associated with MED's efforts to develop the first nuclear weapons during World War II and with other work overseen by AEC. LM is responsible for records management and stakeholder support of 10 remediated MED/AEC sites.

2.8 State Water Quality Standards Site

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

2.9 Plowshare and Vela Uniform Program

LM sites associated with the Plowshare Program (1957–1975) were used or planned for use to test peaceful applications of nuclear detonations using conventional and nuclear detonations. Peaceful applications included civil works and industrial projects (e.g., construction of dams,

harbors, canals, highways, and railroads). LM sites associated with the Vela Uniform Program (1963–1971) were used to develop technologies for detecting underground or underwater nuclear detonations using nuclear and nonnuclear explosives. Others used nuclear detonations for enhancing oil and gas production.

LM provides records management and stakeholder support for more than 150 Plowshare and Vela Uniform Program sites previously investigated by DOE's Office of Environmental Management (EM). When accepting the sites for management, LM evaluated remaining potential environmental liabilities and safety hazards associated with 30 of the sites determined to be most likely to have outstanding liabilities. The sites were grouped based on these evaluations (see Note under Table 1). LM managed five sites during the reporting period. Minor maintenance activities were or are scheduled for four of these sites. LTS&M activities are not expected for sites managed under this program beyond the completion of maintenance activities.

Table 1. Site Count by Regulatory or Programmatic Framework

Regulatory or Programmatic Framework	Site Count Through December 2019
CERCLA/RCRA	8
Nevada Offsites	9
UMTRCA Title I	21
UMTRCA Title II	6
FUSRAP	34
D&D	5
NWPA	1
MED/AEC	10
State Water Quality Standards	1
Plowshare and Vela Uniform Program	5*
Total	**100**

Note:
* Site counts are based on the March 2020 LM *Site Management Guide*. Although Plowshare and Vela Uniform Program consists of five site counts, one site represents more than 150 individual projects in which activities are limited to records only management.

2.10 Additional LM Programs and Facilities

In addition to postclosure site responsibilities described earlier, LM manages the following programs and facilities (Section 3.0 provides specific activities for the reporting period):

- Radiometric calibration facilities: LM maintains five facilities used to calibrate instruments for measurements of uranium, thorium, and potassium. LM grants access to these facilities to non-LM users upon request. The primary calibration facilities are at the Grand Junction Regional Airport in Grand Junction, Colorado, and the Grand Junction, Colorado, Site. Secondary facilities are in Grants, New Mexico; George West, Texas; and Casper, Wyoming.
  - Additional information is available at https://www.energy.gov/lm/services/calibration-facilities.

- Uranium Leasing Program (ULP): LM manages the ULP and administers 31 uranium mining lease tracts located within the Uravan Mineral Belt in southwestern Colorado. Administrative duties include ongoing monitoring and oversight of leaseholders' activities and annual inspections to identify and correct safety hazards and environmental compliance issues.
  - Additional information is available at https://www.energy.gov/lm/services/property-management/uranium-leasing-program.
- Defense-Related Uranium Mines (DRUM) Program: LM established this program in 2016 under the authority of the National Defense Authorization Act for Fiscal Year 2013. LM implements the program by conducting verification and validation (V&V) and reclamation activities at more than 4000 DRUM Program sites, most of which are in Arizona, Colorado, New Mexico, Utah, and Wyoming. V&V activities include mine location reconciliation; field inventory of mine-related features; collection of radiological data (gamma radiation surveys), soil samples, and water samples (when applicable); determination of reclamation or remediation status; and risk screening to determine potential physical safety hazards and risks to human health. Reclamation activities include filling or blocking hazardous mine openings (i.e., adits), installing minor devices such as gates, and removing structures and materials of no historical value to protect public safety, human health, and the environment.
  - Additional information is available at https://www.energy.gov/lm/defense-related-uranium-mines-program.
- The Applied Studies and Technology (AS&T) Program implements a disciplined management process to identify, select, and monitor AS&T studies. This management process: (a) ensures that all AS&T studies support LM's long-term goals, objectives, and strategies; (b) effectively documents and communicates AS&T study results and conclusions; (c) promotes the application of AS&T study outcomes to improve the effectiveness of LM operations; and (d) integrates AS&T into LM-wide optimization and improvement initiatives. The AS&T Program includes a portfolio of long-term (2-year maximum) studies for which the deliverables are new knowledge, enhanced technical capability, advancement of current LM operations, and new or improved technology applications. The AS&T Program also includes a portfolio of short-term investigations. These short-term investigations are approved and performed as requested. Examples include supporting DOE interoffice collaborations across multiple LM sites, supporting approved technical studies, performing short-term investigations, and developing white papers.
  - Additional information is available at https://www.energy.gov/lm/services/applied-studies-and-technology-ast.
- The LM National Laboratory Network (LMNLN) program provides the means to collaborate with DOE's national laboratories and LM's strategic partner (the LMS contractor) to accelerate LM's ability to assess and deploy technology and expertise to sustainably manage the use of legacy land and assets. This collaboration assists LM to reduce budget expenditures and improve stakeholder confidence utilizing the expertise of DOE's national laboratories. LM has signed a Memorandum of Understanding formally establishing Savannah River National Laboratory as the lead national laboratory providing technical support to DOE's management of remediated cleanup sites around the United States.

- LM Business Center (LMBC) at Morgantown, West Virginia: This facility is 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.
  - Additional information is available at https://www.energy.gov/lm/services/records-management.
- LM occupied offices: LM executes its mission and programmatic activities from 10 occupied office locations:
  - Fernald Preserve, Ohio
  - Grand Junction, Colorado
  - Monticello, Utah
  - Morgantown, West Virginia
  - Pinellas County, Florida
  - Tuba City, Arizona
  - Washington, D.C.
  - Weldon Spring, Missouri
  - Westminster, Colorado
  - Window Rock, Arizona

3.0 Summary of General Environmental Reporting

3.1 Oversight

DOE assigns an LM site manager, program manager, or office manager to each LM site or activity to oversee the scope, schedule, and budget of work, address stakeholder concerns, and ensure activities are compliant and protective of human health and the environment. The site, program, or office manager reviews all reports associated with his or her respective activities to ensure data are accurately reported.

3.2 Summary of Site-Specific Activities

LM categorizes sites based on the level of 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 site conditions (e.g., changes in groundwater remediation strategies or regulatory requirements).

The three categories of LM sites and their site counts, according to the LM *Site Management Guide*, available at https://www.energy.gov/lm/downloads/site-management-guide, are as follows:

1. Category 1 sites
    - Category 1 sites are listed in Table A-1 of Appendix A of this ASER and include 43 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 of Appendix A and include 48 LM sites.
    - LM activities may include:
        - Conducting required inspections (typically annually) and maintenance.
        - Sampling for environmental monitoring data, as required.
        - Addressing potential environmental liabilities and safety hazards.
        - 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 of Appendix A 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 and maintenance.
        - Sampling for environmental monitoring data, as required.
        - Managing site records and responding to stakeholder inquiries and requests for information.
        - Implementing and managing administrative and institutional controls.
        - Preparing inspection, monitoring, and compliance reports, as required.

Appendix A summarizes the monitoring and associated reporting for each site; sites geographically grouped as one in the LM *Site Management Guide* are addressed individually in the tables. Most of the information in the tables is available on site-specific websites accessible at https://www.energy.gov/lm/sites/lm-sites and from the site-specific links in Appendix A of

this report. Additional reporting information is available upon request. Appendix A is a summarized version of the environmental reporting provided in lieu of individual reports.

The following LM facility and program activities were performed in 2019 in addition to work completed at the categorized sites:

1. Radiometric calibration facility activities
    - Completed facility maintenance, annual inspections, and records-related activities.
2. ULP activities
    - Completed annual inspections of mining operations to ensure leaseholders adhere to lease stipulations, and provided oversight of leaseholder routine maintenance activities.
    - Prepared the annual status and activities report summarizing LM activities for the ULP during the calendar year.
    - Initiated development of an Environmental Assessment (EA) associated with a proposed LM project to perform reclamation activities at the Burro Mines Complex near Slick Rock, Colorado.
    - Leaseholders did not resume any activities that required submittal of mining, exploration, or reclamation plans to LM for approval after a court-ordered injunction against DOE and the ULP was dissolved on March 18, 2019 (effective date).
3. DRUM Program activities
    - Completed reconciliation, inventory, and field verification and validation of 571 BLM, U.S. Forest Service, state, and private mines in Colorado, New Mexico, South Dakota, Utah, and Wyoming.
    - Prepared summary reports for each mine or group of mines to be transmitted to the appropriate agency.
4. Plowshare and Vela Uniform Program activities
    - Conducted historical research to obtain additional information about the sites.
    - Performed site visits at sites to document current conditions.
    - Initiated project planning, site surveys, and work control document development for proposed reclamation of the Bronco, Colorado, Site.
5. AS&T Program activities
    - Executing the following studies and activities, which enhance LM's strategic capabilities by optimizing current LM operations and advancing technological applications:
        - Effects of Soil-Forming Processes on Cover Engineering Properties
        - Water Balance Cover Monitoring
        - Enhanced Cover Assessment Project and Cover Conversion Pilot Study
        - Aeolian Deposition

- Educational Collaboration
- Persistent Secondary Contaminant Sources
- Disposal Cell Erosion Risk Evaluation
- Groundwater Monitoring Optimization Software Evaluation
- EM Crescent Junction Support
- UAS Multi Spectral Data Calibration and Evaluation

- Supporting collaboration between LM and the LMNLN.
- Supporting collaboration between LM and EM's disposal cell in Crescent Junction, Utah, to convert the disposal cell cover from a prescriptive rock cover to an evapotranspiration cover.
- Preparing an internal annual report documenting application of AS&T project outcomes to improve LTS&M and reduce costs.

4.0 Summary of Environmental Management System and Sustainability

As required by previous 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 September 20, 2018. 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 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*; the *Worker Safety and Health Program (10 CFR 851)* (LMS/POL/S14697), and Title 10 *Code of Federal Regulations* Section 851 (10 CFR 851).

The associate undersecretary of DOE's Office of Environment, Health, Safety, and Security issued memorandum AU21-16-N1-0050, *Departmental Use of Environmental Management Systems*, in October 2016. It required DOE sites to conform to the new ISO 14001:2015 version by October 1, 2018; LM met this conformance date.

The LM EMS public website describes the EMS and provides links to many of the documents and reports identified in this section at https://www.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" webpage at https://www.energy.gov/lm/services/joint-environmental-management-system-ems/guiding-documents-and-links.

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

4.1 Performance Measures

The documents listed in this section define reporting and performance measures for various EMS program elements and detail progress toward meeting performance goals and objectives. Some of these documents are available on the LM EMS public website on the "EMS Goals/Progress/Plans/Reports" webpage at https://www.energy.gov/lm/services/joint-environmental-management-system-ems/ems-goalsprogressplansreports.

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

- *2019 LM Site Sustainability Plan* (LMS/S07225): LM reports past performance and future plans for meeting sustainability goals in the Site Sustainability Plan. This plan helps DOE meet its sustainability requirements outlined in DOE Order 436.1 and Executive Order (EO) 13834, *Efficient Federal Operations*, issued May 17, 2018 (revoking EO 13693). The Council of Environmental Quality issued implementing instructions and guidance in April 2019 to assist program offices in developing goals and targets to meet the requirements in EO 13834. LM updated and established new goals to comply with targets and progress metrics outlined in EO 13834.
- 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.
- *2019-2023 Significant Environmental Aspects* (LMS/S24255): This document describes the four categories of significant environmental aspects from LM operations, including land use, resource consumption, waste management, and releases to the environment. 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: Section 432 requires federal agencies to identify "covered facilities" (defined by DOE guidance) that constitute at least 75% of the agency's total facility energy use. Comprehensive energy and water evaluations of 25% of covered facilities are reported each year, and an evaluation of each covered facility is completed once every 4 years. Information is uploaded annually to the DOE Sustainability Dashboard.
- Facilities Information Management System updates: This system 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 and 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 awards and recognitions for EMS-related activities:

- The Fernald Preserve, Ohio, Site received the 2019 U.S. Environmental Protection Agency (EPA) National Federal Facility Excellence in Site Reuse Award in the National Priorities List category. The award recognizes accomplishments at the Fernald Preserve in environmental education, environmental remediation, and natural resources conservation.
- LM received the Electronic Product Environmental Assessment Tool (EPEAT) Purchaser Award for the fifth consecutive year. The Green Electronics Council awards organizations with an EPEAT Purchaser Award for their excellence in sustainable procurement of electronic equipment. LM was awarded the highest rating, with 5 stars.

5.0 Summary of Environmental Compliance

The following subsections summarize compliance with applicable regulations and the related 2019 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 that apply 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 (i.e., 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 EPA or state agencies, or both, 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 (see Table A-2 and Table A-3) is required for a CERCLA site with residual contamination to evaluate whether the remedy at the site remains protective of human health and the environment.

- No Five-Year Review reports were initiated or scheduled to be completed during the reporting period.

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.

The following activities were performed in compliance with RCRA:

- Each site generating hazardous waste maintained a Very Small Quantity Generator status.
- Hazardous waste was shipped from the Grand Junction, Colorado, site to an approved local, county-run hazardous waste collection facility for disposal.
- Hazardous waste was generated at the Grand Junction site under the RCRA episodic generator rule and was shipped offsite to an approved facility for silver reclamation and subsequent disposal.
- Hazardous waste was shipped from the LM office at Westminster, Colorado, to an approved local hazardous waste collection facility for treatment and 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 the state's Global Risk-Based Corrective Action regulations.
- The 4.5 Acre Site at the Pinellas County site received a Site Rehabilitation Completion Order from the State of Florida, which granted a No Further Action Without Controls closure.
- LM was issued an EPA Identification (ID) number from EPA Region 10 for Amchitka Island. This EPA ID was obtained as a contingency and will only be used if hazardous waste is generated during site investigation activities on Amchitka.

Federal Facility Compliance Act (FFCA): Enacted in 1992, FFCA amended RCRA with the objectives of (1) bringing all federal facilities into compliance with applicable federal and state hazardous waste laws, (2) waiving federal sovereign immunity under those laws, and (3) allowing the imposition of fines and penalties. The FFCA gives EPA authority to issue administrative compliance orders to federal agencies that are 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 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.

- LM maintained and updated a chemical inventory to track quantities of chemicals at LM sites and facilities. The annual inventory allowed the applicability of EPCRA reporting to be evaluated. EPCRA Tier II reports were submitted for the following sites and facilities:
  - Grand Junction site for the storage and use of lead-acid batteries
  - Rocky Flats Site, Colorado, for the storage and use of lead-acid batteries
  - Fernald Preserve for the temporary use and storage of a waste absorbent
  - LMBC for the storage of diesel fuel in an emergency power generator aboveground storage tank

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

- LM generated and disposed asbestos waste associated with abatement of asbestos-contaminated material at the Piqua, Ohio, Decommissioned Reactor Site.

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 "restricted use" herbicides or pesticides.

- 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 drivers associated with radioactive material at the site. For example:

- Radioactive waste generated at an UMTRCA site is characterized as one of the following:
  - Residual radioactive material (UMTRCA Title I site)
  - 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 one of the following:
  - Low-level radioactive waste (LLRW)
  - Naturally occurring radioactive material

Management and disposal requirements differ for these specific waste types. Radioactive wastes are managed in accordance with the AEA; UMTRCA; 10 CFR 40, "Domestic Licensing of Source Material"; and DOE Order 435.1 Chg 1, *Radioactive Waste Management.* The following are site-specific activities related to radioactive waste management:

- Grand Junction, Colorado, Disposal Site: LM continues to operate and receive radioactive materials at this site, which is used for the permanent disposal of residual radioactive materials described in Sections 101 and 102 of Title I of UMTRCA and other radioactive materials as described 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. Because Congress had not passed legislation by the end of 2019 to extend the closure date, LM has initiated planning for closure activities at the site.
  - Significant revisions of the Grand Junction disposal site's waste acceptance criteria were initiated in 2019, with completion expected in 2020. The revised waste acceptance criteria will affect the radioactive wastes that are acceptable for disposal.
  - Radioactive materials from UMTRCA Title I vicinity properties in Grand Junction were disposed at the Grand Junction disposal site.

- Fernald Preserve: LLRW associated with refurbishment of the Converted Advanced Waste Water Treatment (CAWWT) backwash basin was shipped to the Waste Control Specialists facility in Andrews, Texas, for disposal.

5.2 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 that is subject to National Emission Standards for Hazardous Air Pollutants (NESHAPs). 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.

- A West Virginia General Permit 65 was obtained to operate the LMBC emergency generator.
- NESHAPs requirements associated with asbestos abatement at the Piqua site were implemented as the project was executed.
- No major sources of criteria air pollutants or hazardous air pollutants were identified at other LM sites.

5.3 Water Quality and Protection Compliance Status

Clean Water Act (CWA) National Pollutant Discharge Elimination System (NPDES): 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 NPDES permit program controls discharges. In 2019, multiple LM sites maintained NPDES permits. These NPDES permits include discharge permits and storm water permits as described below.

- At the Fernald Preserve, storm water runoff sampling of nonradiological pollutants is conducted, and effluent discharges are treated in compliance with an NPDES permit administered by the state. An NPDES permit renewal application was submitted to the Ohio EPA in 2019 to support the new NPDES permit that will take effect in 2020.
- At the Mound, Ohio, Site, an NPDES permit covers discharge of treated groundwater under a CERCLA authorization demonstrating compliance with the CWA. No discharge has occurred since September 15, 2014, to permit an undisturbed evaluation of the enhanced attenuation field demonstration involving the injection of edible vegetable oil into the groundwater.
    - The enhanced attenuation field demonstration was completed in 2018. The results showed consistent behavior and the continuation of faster degradation of volatile organic compounds (VOCs) in the groundwater at Operable Unit 1. After completing the final year of the study, LM and regulators agreed to keep the pump and treatment system in standby mode, so current enhanced attenuation treatment zones would not be altered and to maintain an interim monitoring program to focus on the best indicators of the

microbial community, aquifer geochemistry, and residual VOC concentration. It was also agreed that LM would evaluate a potential amendment to the current groundwater remedy of pump and treatment to an attenuation-based remedy. LM has transmitted a draft focused feasibility study and draft proposed plan for regulatory review. LM anticipates an Operable Unit 1 Record of Decision Amendment in FY 2021.

- At the Weldon Spring Site, Missouri, an NPDES permit is maintained with the Missouri Department of Natural Resources. This permit covers discharges from the Leachate Collection and Removal System and is maintained as a contingency to current disposal methods. No discharges have been conducted under this permit.
- At various LM sites, pest management programs are implemented in accordance with EPA's 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 Oil Pollution Prevention: At the LMBC, a self-certified Spill Prevention, Control, and Countermeasure (SPCC) Plan is maintained in accordance with 40 CFR 112. The SPCC rule applies to the LMBC because diesel fuel is stored in a 3000-gallon aboveground storage tank associated with the emergency generator.

CWA Storm Water Management and EISA Section 438: A storm water management program was established by the CWA to reduce runoff and improve water quality. Under Section 438 of the 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 that preconstruction and postconstruction 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 for Rocky Flats Property Central Operable Unit* (DOE-LM/1497-2007) during construction projects, thus meeting the substantive requirements for storm water permitting. EPA and the Colorado Department of Public Health and Environment have approved this approach. Soil disturbances are controlled by institutional controls managed through the *Rocky Flats Legacy Management Agreement*.
- At the Canonsburg, Pennsylvania, Disposal Site, the North Terrace Erosion Repair Project was completed in 2019. Approximately 1200 linear feet of stream bank was repaired along Chartiers Creek running along the northeast boundary of the site. Erosion controls were set in place along the creek to prevent storm water runoff from entering the creek during construction. Revegetation of the area included the planting of a forest riparian buffer strip to further protect the area north of the disposal cell against future erosion from flooding events.
- At the Fernald Preserve, LM managed sitewide and construction-related storm water in accordance with the *Fernald Preserve, Fernald, Ohio, Storm Water Pollution Prevention Plan* (LMS/FER/S03161) and the current Fernald Preserve NPDES permit. LM inspected erosion control best management practices (BMPs) associated with the 2019 construction project to refurbish the CAWWT facility backwash basin.

- At the Durango, Colorado, Disposal Site, inspections of storm water controls were discontinued in 2019 because it was determined that revegetation of areas disturbed by a 2017 construction project had reached adequate density. Although a storm water permit was not required, storm water controls were installed as a BMP.
- At the Weldon Spring Site, a new building is under construction to replace the Interpretive Center and site office trailer. USACE operates within an interagency agreement with DOE to coordinate the building design and construction. The storm water runoff was evaluated in accordance with Section 438 of EISA, and county and state storm water permits were attained to address the land disturbance.

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 with respect to groundwater contamination. ARAR information is detailed in the environmental monitoring reports for each site, if applicable. The Weldon Spring Site has approval from the Metropolitan St. Louis Sewer District (MSD) to transport treated disposal cell leachate and purge water from groundwater sampling to the MSD's Bissell Point Plant to ensure that uranium concentrations remain below the 30 micrograms per liter (µg/L) drinking water standard. The MSD approval was renewed in December 2019, in accordance with the 2-year renewal cycle.
- All other occupied LM sites and facilities have service connections to municipal drinking water systems, provided by the local utility company which are operated and maintained in accordance with the SDWA.

Emerging Contaminants: Emerging contaminants are a large variety of chemicals that are not currently regulated but are suspected of having a potential impact on human health and the environment when present in groundwater. Examples of products containing such chemicals include but are not limited to pharmaceuticals, household products, agricultural products, and fire retardants. Although emerging contaminants are not currently regulated, EPA has consulted with federal facilities regarding unique issues and challenges related to site-specific contaminants, including at CERCLA sites where cleanup actions are complete. The following LM CERCLA/RCRA sites are engaged in activities associated with emerging contaminants:

- Rocky Flats Site: The following activities were conducted during the reporting period in response to a letter received from the State of Colorado in 2018 regarding whether perfluorooctanoic acid (PFOA) and perfluorooctanesulfonic acid (PFOS) are present at the Rocky Flats Site. A records search and interviews with former employees suggested these compounds might be present because of activities associated with the former Rocky Flats Plant Fire Department. A sampling plan was prepared, sample collection and analysis were performed, and a report was prepared for submission to the state in 2019. Locations that were sampled included three monitoring wells, influent to two groundwater treatment systems, two surface water locations, and one seep. Concentrations of one or both constituents were found to exceed the 2016 EPA Health Advisory level (70 nanograms per liter, combined PFOA and PFOS) at one well and influent to one treatment system. The state is currently working on a regulatory policy for these and other polyfluorinated alkyl substances (PFAS). No further work at the Rocky Flats Site was requested in 2019.

- Fernald Preserve: In the August 2016 CERCLA *Fourth Five-Year Review Report for the Fernald Preserve*, DOE was required to address the presence of the emerging contaminants PFASs through two deliverables. To fulfill these deliverable requirements, DOE submitted the *Draft Perfluorinated Compound Groundwater Screening Sampling and Analysis Plan* to EPA in December 2016, and in March 2018, DOE submitted *the Draft Polyfluorinated Alkyl Substances (PFAS) Investigation Plan for the Fernald Preserve*. Interim recommendations were established for PFOA and PFOS by EPA headquarters in December 2019. To date, no sampling for these emerging contaminants has occurred at the Fernald Preserve. LM will continue to work with EPA and to address any site-specific PFAS issues as more information and regulatory guidance are available. The fifth CERCLA Five-Year Review scheduled for 2021 provides an opportunity to revisit the issue.
- Mound site: LM continued the vapor intrusion assessment in accordance with the recommendation in the September 2016 CERCLA *Fourth Five-Year Review for the Mound, Ohio, Site, Miamisburg, Ohio*. In 2019, EPA approved the phase I vapor intrusion assessment report that provided results of the preliminary screening and source assessment. Areas were identified that required soil gas sampling as part of phase II. LM submitted the Phase II Sampling and Analysis Plan (SAP) and the Quality Assurance Project Plan (QAPP) for regulatory review.

EO 11988, *Floodplain Management*: EO 11988, enacted in 1977, requires federal agencies to avoid, to the extent possible, short- or long-term work, activities, or disruptions that cause adverse impacts in floodplains and to avoid 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 applicable federal, state, tribal, and local requirements. Changes to flood hazard determinations are noted in the *Federal Register*, tracked for LM sites, and identified for evaluation in the Legacy Management Support (LMS) *Environmental Compliance Regulatory Review Quarterly Report*.

EO 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 such work is 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. A nationwide permit was obtained for a small wetland impoundment as part of the CAWWT backwash basin refurbishment project in 2019. The wetlands were not disturbed during project implementation, so no mitigation was necessary.
- Rocky Flats Site staff continued wetland mitigation monitoring to document the reestablishment of mitigation wetlands.

5.4 Other Environmental Statutes Compliance Status

National Environmental Policy Act (NEPA): NEPA was enacted in 1970 to help federal 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 their proposed 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 with a Categorical Exclusion Evaluation (CXE) and a *NEPA Categorical Exclusion Determination Form* (LM-Form-4-20-5.0-0.0). Recent categorically excluded actions are accessible for public review at https://www.energy.gov/lm/services/joint-environmental-management-system-ems/national-environmental-policy-act-nepa. Below is a summary of NEPA documents either completed or in progress during the reporting period.

- 32 CXEs were completed
- The following EAs were in progress:
  - An EA being prepared by Argonne National Laboratory on behalf of LM for the proposed reclamation of the Burro Mines Complex, which is managed under the ULP
  - An EA being prepared by USACE on behalf of LM for the proposed demolition of buildings at the Piqua site
  - An EA being prepared by LM for the Shiprock, New Mexico, Disposal Site's proposed groundwater compliance actions
  - A Programmatic EA being prepared by LM for proposed grazing activities
- Additionally, as the applicant for proposed land withdrawals, LM participated in the preparation of EAs for and in coordination with the BLM for the following sites:
  - Bear Creek, Wyoming, Disposal Site: in progress
  - Central Nevada Test Area, Nevada: EA completed in November 2018; Finding of No Significant Impact signed January 2019
  - Split Rock, Wyoming, Disposal Site: in progress

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. USFWS's Information for Planning and Consultation 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 in cases of a formal consultation, a Biological Assessment is prepared. Additional consultation with tribal authorities may be required on tribal lands.

- Gunnison, Colorado, Processing Site: In February 2019, an informal consultation with USFWS confirmed that groundwater sampling and related routine activities could be

performed within the breeding season of the Gunnison sage-grouse with no adverse impacts to the species.

- LM sites within the San Juan River Basin (see site list below): In March 2019, LM received concurrence that routine activities in the San Juan River sub-basin are unlikely to affect endangered Colorado River fish, the Mesa Verde cactus, or designated critical habitat for threatened and endangered species.
  - Monticello, Utah, Disposal and Processing Sites
  - Mexican Hat, Utah, Disposal Site
  - Monument Valley, Arizona, Processing Site
  - Shiprock site
  - Durango, Colorado, Disposal and Processing Site
  - Gasbuggy, New Mexico, Site
- Gunnison, Colorado, Disposal Site: In August 2019, an informal consultation with USFWS confirmed that installed fence flagging falls within the scope of the existing Biological Opinion for routine activities at the site.
- ULP Burro Mines Complex: In September 2019, an informal consultation with USFWS determined that proposed reclamation activities have been evaluated in the existing Biological Opinions for the ULP. Even though it is not tiered from the existing NEPA Programmatic Environmental Impact Statement, this determination is valid for the proposed activities at the Burro Mines Complex.
- Bronco, Colorado, Site: LM coordinated with BLM to plan threatened and endangered plant surveys for Dudley Bluffs bladderpod and Dudley Bluffs twinpod in the project area for a proposed well closure. If surveys locate threatened or endangered plants that would be impacted by the work, LM will consult with USFWS.
- Shiprock site: LM coordinated with the Navajo Nation to plan surveys for the threatened Mesa Verde cactus in the proposed project area for a pipeline removal project. Results of the surveys will inform LM's consultations with the Navajo Nation and USFWS for this species.
- Monticello disposal and processing sites: A project that replaced approximately 7800 feet of perimeter fence with wildlife-friendly fence was performed to minimize impacts to designated critical habitat for the Gunnison sage-grouse.
- Rocky Flats Site: Consultations and notifications associated with project activities were completed in accordance with the site's Programmatic Biological Assessment.
- Fernald Preserve: Staff performed a survey for running buffalo clover, with none found, before removing vegetation from the site outfall line corridor. A release of 49 pairs of beetles occurred in June 2019 as part of a 5-year agreement with the USFWS and the Cincinnati Zoo to introduce the federally endangered American burying beetle to the Fernald Preserve through at least 2022.

Invasive Species Management: In accordance with the Federal Noxious Weed Act of 1974, LM cooperates with federal, state, and local agencies as well as farmers associations and private individuals to control, eradicate, or prevent the spread of noxious weeds. The *Procedure for Handling Herbicides at Western Legacy Management Sites* (LMS/PRO/S12853) outlines the process followed to implement treatment of invasive species at LM sites. LM also complies with EO 13751, *Safeguarding the Nation from the Impacts of Invasive Species* (December 5, 2016), which amended EO 13112, *Invasive Species* (February 3, 1999), and calls on federal agencies to prevent the introduction, establishment, and spread of invasive species and to eradicate and control populations of established invasive species.

- In 2019, LM treated 41 different species of noxious weeds on 746.61 acres across 29 different sites. From 2018 to 2019, 7 sites decreased their acreage of noxious weeds sprayed, 10 sites increased their acreage sprayed, and 12 sites experienced no change in acreage sprayed. Canada thistle (*Cirsium arvense*), which occurred at 11 sites, was the most widespread noxious weed treated. Both hardheads (*Rhaponticum repens*) and musk thistle (*Carduus nutans*), which occurred at seven different sites, were the next most widespread.

Migratory Bird Treaty Act (MBTA): The MBTA prohibits possessing or destroying migratory birds or their parts, eggs, and nests without a permit from USFWS. Additionally, EO 13186*, Responsibilities of Federal Agencies to Protect Migratory Birds*, directs executive departments and agencies to take certain actions to further implement the MBTA. 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.

- DRUM Program field activities were scheduled during specific windows to avoid significant impacts to migratory birds.
- Various LM site-specific environmental review documents and statements of work provided guidance about BMPs to protect migratory birds.
- The Fernald Preserve maintains a Nest Destruction Permit issued by the Ohio Department of Natural Resources (ODNR). This permit is for removing Canada goose nests and eggs if they are determined to be a nuisance. A nesting pair of mute swans was observed in the Lodge Pond area in 2019, but no offspring were observed. These species are considered invasive by the ODNR; therefore, ODNR grants permission to remove nests or addle the eggs of the mute swans. No formal permit is required. Eggs were addled at one nest site in 2019.
- Project activities at the Rocky Flats Site followed the site document guidance and BMPs addressed in the *Migratory Bird Treaty Act Issues, Natural Resource Management Activities, and Maintenance and Project Activities at the Rocky Flats Site, Colorado.*

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

- DRUM Program field activities in the BLM Moab District were scheduled during specific windows to avoid significant impacts to golden eagles.
- BMPs were incorporated into DRUM Program field operations plans to avoid specific field activities during bald and golden eagle nesting seasons.

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 consider 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.

Section 106 Consultations

- LM initiated the Section 106 consultation process 17 times in 2019. LM completed the majority of these consultations in 2019.
- Some projects required consultation with both a State Historic Preservation Officer (SHPO) and a Tribal Historic Preservation Officer (THPO) and/or tribal representatives.
- One consultation effort resulted in a finding of adverse effect to historic property at the Piqua site if the demolition alternative is selected.

Archeological Surveys

- An archaeological survey was conducted at the Lakeview, Oregon, Disposal Site in 2019 to support the installation of aerial monuments and the possible removal of offsite, nearby groundwater monitoring wells. No archaeological sites or potentially eligible historic properties were observed within the defined area of potential effect. The Oregon SHPO concurred with the LM determination that no historic property is present.
- A Phase I archaeological survey was conducted by USACE on behalf of LM for the Piqua site to identify archaeological resources that may be impacted by the proposed demolition. The survey did not identify any significant prehistoric or historic archaeological resources within the area of potential effects and recommended that no archaeological resources that merit consideration as historic property are present at this location. The Ohio SHPO and one of three tribes identified as having an active interest in Miami County, Ohio, concurred with this determination. The remaining two tribes did not respond within the 30-day concurrence period.

Section 110 Activities

- LM completed a historic property survey at the Rulison, Colorado, Site, where an underground nuclear device was detonated in 1969 to stimulate gas production. A final report is expected to be published in 2020.
- LM completed a historic property survey at the Burro Mines Complex in San Miguel County, Colorado, where LM is proposing reclamation activities. A final report is expected to be published in 2020.

Environmental Justice (EO 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*): Environmental justice is the fair treatment and meaningful involvement of all people—regardless of race, color, national origin, or income—with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. Fair treatment means that no population bears a disproportionate share of negative environmental consequences resulting from industrial, municipal, and commercial operations or from the execution of federal, state, and local laws, regulations, and policies. Meaningful involvement requires that everyone has effective access to decision makers

and that all communities can make informed decisions and take positive actions to produce environmental justice for themselves.

- Shiprock, New Mexico, is an environmental justice community, as it is a minority community that also experiences substantial economic challenge. Public scoping under NEPA was conducted to support development of a NEPA EA for the removal of the existing evaporation pond, which has reached the end of its design lifespan, and to support proposed changes to the UMTRCA Groundwater Compliance Action Plan (GCAP). Two public scoping meetings were held at the Shiprock Chapter House, where LM presented information on the purpose and need, resources, and issues being addressed; public comments were received that have resulted in adjustments to the proposed action being evaluated. A scoping summary report is being prepared.

5.5 Unplanned Nonradiological Releases

This section provides information on unplanned, nonroutine releases of pollutants or hazardous substances. Unplanned radiological releases are discussed in Section 8.1.

Table 2 provides a list of unplanned releases, such as spills or leaks, that occurred during the reporting period, including the date each release occurred, the amount of material released, an explanation of the release, corrective actions taken, and reporting requirements. There were no releases that exceeded applicable reporting threshold volumes.

Table 2. Summary of Unplanned Nonradiological Releases

Site or Facility	Release	Date of Release	Volume	Reporting Required?	Immediate or Corrective Actions
LM office at Westminster, Colorado	Sulfuric acid leak from laboratory dispenser	06/03/2019	1 ounce	No	Acid storage cabinet and secondary containment were tagged out of service. Acid was neutralized according to spill kit manufacturer instructions for proper disposal.
Fernald Preserve	Hydraulic fluid leak from damaged hose fitting on track loader	07/16/2019	Less than 1 ounce (drips observed)	No	An absorbent pad was placed under the equipment to absorb dripping fluid until equipment hose fitting could be repaired.
Rocky Flats Site	Hydraulic fluid leak from skid steer equipment	08/13/2019	Less than 16 ounces (includes impacted soil)	No	Equipment was immediately shut down and an absorbent pad was placed to contain the leak. Rental company was notified to replace faulty equipment. Impacted soil was removed and containerized for disposal in accordance with site procedures.
Rocky Flats Site	Hydraulic fluid release from excavator line break	09/20/2019	2 quarts	No	Equipment was shut down, and absorbent pads were used to absorb approximately 2 quarts of fluid from the engine compartment. Impacted surrounding soil and rock were removed and placed on plastic sheeting pending proper disposal by subcontractor.

5.6 Summary of Environmental Notices

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

- During the reporting period, no notices were received from external agencies or stakeholders.

Self-identified instances of noncompliance are listed below:

- DRUM Program staff self-identified a minor regulatory noncompliance associated with field visits being conducted without appropriate NEPA documentation. The LMS contractor determined that NEPA documents for the DRUM Program covered routine activities at sites in western Colorado and eastern Utah, but not in New Mexico and other regions of Colorado where activities occurred. However, agreements between LM and landowner agencies were in place when work was conducted. Appropriate NEPA documents citing applicable DOE Categorical Exclusions were subsequently prepared for all additional areas where DRUM Program mines are known to exist. This event did not result in a permit noncompliance, notice of violation, or environmental impacts.

6.0 Additional Natural Resources Management

In addition to the actions taken under specific regulations, as listed above in Section 5.4, LM completes the following activities for natural resources management:

- On May 19, 2015, the U.S. Department of Agriculture secretary and the EPA administrator, 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 that multiple stressors (e.g., pests and pathogens, reduced habitat, lack of nutritional resources, and exposure to pesticides) have on pollinator health. LM's Ecosystem Management Team works to reduce pollinator stressors at LM sites by implementing BMPs.
- LM's Ecosystem Management Team tracks the acreage and types of pollinator-friendly BMPs implemented at LM sites each year between May 1 and April 30 of the following year. In April 2019, the *Office of Legacy Management Sites Pollinator Health Best Management Practices* report documented the implementation of BMPs across 2791 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 ODNR
  - Special-Purpose Salvage Permit for the Fernald Preserve, issued by 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, monitoring requirements, the number of wells, the frequency of sampling, and contaminants of concern (COC) are site specific. For example, groundwater samples may be collected quarterly; semiannually; annually; or every 2, 3, 5, or 10 years. There are 20 LM sites with point of compliance (POC) wells. The rationale for a POC well varies depending upon the regulatory framework (e.g., CERCLA versus UMTRCA). For this report, POC wells are monitoring wells at which regulatory standards apply, as defined in site-specific documents (e.g., Federal Facilities Agreements, Long-Term Surveillance Plans, and GCAPs).

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 wells sampled for groundwater monitoring purposes (may include private wells in addition to DOE-owned wells)
- The number of POC wells
- COC exceedances at POC wells sampled during the reporting period (identified in Table A-4 with bold and underlined font)

COC exceedances of regulatory standards were reported for nine sites with POC monitoring wells sampled during the reporting period. Exceedances of COCs may not result in violations, as violations depend on the regulatory framework for each site. Reports discussing COC exceedances at POC wells are referenced in Table A-4 footnotes and are available on the LM public website. These reports contain contaminant time-concentrations plots from which trending can be evaluated. Data on COC exceedances at UMTRCA processing sites and D&D sites are presented in Table A-5, as this information is not easily obtainable on the LM public website.

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 *Environmental Radiation Protection Program Plan* (LMS/POL/S13339), the *Radiation Protection Program Plan* (LMS/POL/S04373), and the *Radiological Control Manual* (LMS/POL/S04322). The purpose of the RPP is to implement the applicable requirements of 10 CFR 835, "Occupational Radiation Protection," and DOE Order 458.1 Chg 3, *Radiation Protection of the Public and the Environment.*

LM implements the RPP at applicable LM sites and 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 (ALARA). LM's RPP also includes ensuring that activities are conducted in accordance with the following laws:

AEA: The purpose of the AEA is to ensure 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, workforce restructuring and benefits continuity, property management, land use planning, and community assistance.

UMTRCA: As discussed in Section 2.3, LM manages UMTRCA Title I and Title II sites, including inspection, monitoring, and maintenance activities. Plans and reports that summarize UMTRCA activities are described below:

- Requirements for inspections, monitoring, and maintenance activities are specified in site-specific Long-Term Surveillance Plans, LTS&M Plans, and GCAPs, all of which are reviewed and agreed to by NRC (see Tables A-2 and A-3).
- 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*: Establishes requirements to protect the public and the environment against undue risk from radiation associated with radiological activities conducted under DOE control.

- LM implements the *Environmental Radiation Protection Program Plan* to ensure that work involving radiological hazards complies with the requirements of DOE Order 458.1 Chg 3. 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.
- LM/LMS held two routine semiannual ALARA meetings in 2019 to allow personnel to be involved in the ALARA process, including identification of potential environmental and public impacts.
- A site-specific ALARA review was completed for the CAWWT backwash basin refurbishment project at the Fernald Preserve. No other site-specific ALARA reviews were completed.

8.1 Unplanned Radiological Releases

There were no unplanned radiological releases in 2019.

8.2 Clearance of Property

This section summarizes the real and personal property clearance activities for LM, including application of authorized limits, type of material or property, and expected end-use

scenario (e.g., disposal, recycle, reuse). This information is provided in accordance with DOE Order 458.1 Chg 3, which requires a summary of the clearance of property to be reported in the ASER.

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. LM does not release property to the public (e.g., vehicles, equipment, or other materials) with residual radioactivity above the preapproved authorized limits.

- No DOE-owned real or personal property was cleared from LM sites in 2019 other than radioactive waste shipments identified in Section 5.1.

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 3, *Facility Safety*. This includes compliance with the following standards of the National Fire Protection Association: Standard 1143, *Standard for Wildland Fire Management*, published in 2018, and Standard 299, *Standard for Protection of Life and Property from Wildfire*, published in 1997. Wildland fire management strategies implemented include use of fire protection equipment, vegetation management, site access controls, job safety analyses or procedures, 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

Although unoccupied sites do not have wildland fire management plans (since work is performed so infrequently), wildland fire hazards and controls are addressed in safety and health documents such as the *Job Safety Analysis* form. It is recognized that fires may occur when no one is onsite to make initial notifications or to give information to responders. Signs posted at unoccupied sites include a 24-hour telephone number so information can be reported.

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 that consistently meets or exceeds mission objectives while minimizing potential hazards to the environment, the public, and workers. The management systems incorporate the requirements of DOE Order 414.1D Chg 1, *Quality Assurance*, using ISO standard 9001:2015, *Quality Management Systems–Requirements*, as the chosen national standard. Implementing documents include the *LM Quality Assurance Policy* (Policy 414.1B); the *Quality Assurance Program Plan* (LM-Plan-1-10.0-1.0); and the LMS *Quality Assurance Manual* (LMS/POL/S04320).

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, compliant, and efficient manner.

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 Assessment and Issues Management 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 site-specific or program-specific QAPPs, SAPs, or in the *Sampling and Analysis Plan for the U.S. Department of Energy Office of Legacy Management Sites* (LMS/PRO/S04351), also called the LM Sampling and Analysis Plan. Soil and surface water samples associated with the DRUM Program are collected, managed, and analyzed in accordance with the *Defense-Related Uranium Mines Quality Assurance Program Plan* (LMS/DRM/S15867) and the *Defense-Related Uranium Mines Verification and Validation Work Plan* (LMS/DRM/S13690). These documents provide detailed procedures for sampling environmental media in a consistent and technically defensible manner. These procedures are reviewed and updated as required to ensure the most up-to-date processes are used.

Guidelines for evaluating sample collection and field measurement activities against site and program-specific requirements found in QAPPs and the LM Sampling and Analysis Plan are detailed in the *Environmental Data Validation Procedure* (LMS/PRO/S15870). Validation of environmental data is performed to determine whether 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. Field quality assurance processes include:

- Completing training and qualification programs
- Following QAPPs, SAPs, procedures, or the LM Sampling and Analysis Plan
- Collecting and analyzing quality control samples, including field duplicates, equipment blanks, and trip blanks
- Reviewing field documentation
- Performing independent surveillances of field activities by Q&PA staff
- Inspecting and maintaining monitoring wells

LM uses contracted analytical laboratories and treatment, storage, and disposal facilities (TSDFs) when required and ensures these providers participate in the DOE Consolidated Audit Program or the Mixed Analyte Performance Evaluation Program. Table 3 lists all contracted analytical laboratories and TSDFs used in 2019.

Table 3. 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 880 Riverside Parkway West Sacramento, CA 95605
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 70767
Test America Laboratories Inc.	4995 Yarrow Street Arvada, CO 80002
TSDF	**Location**
EnergySolutions Inc. Clive Disposal Facility	Interstate 80 Exit 49 Grantsville, UT 84029
Waste Control Specialists Disposal Facility	9998 West State Highway 176 Andrews, TX 79714

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.energy.gov/lm/maxey-flats-kentucky-disposal-site
Nevada Offsites
Chariot, AK, Site https://www.energy.gov/lm/chariot-alaska-site
FUSRAP Sites
Acid/Pueblo Canyon, NM, Site https://www.energy.gov/lm/acidpueblo-canyon-new-mexico-site
Adrian, MI, Site https://www.energy.gov/lm/adrian-michigan-site
Albany, OR, Site https://www.energy.gov//lm/albany-oregon-site
Aliquippa, PA, Site https://www.energy.gov/lm/aliquippa-pennsylvania-site
Attleboro, MA, Site https://www.energy.gov/lm/attleboro-massachusetts-site
Berkeley, CA, Site https://www.energy.gov/lm/berkeley-california-site
Beverly, MA, Site https://www.energy.gov/lm/beverly-massachusetts-site
Buffalo, NY, Site https://www.energy.gov/lm/buffalo-new-york-site
Chicago North, IL, Site https://www.energy.gov/lm/chicago-north-illinois-site
Chicago South, IL, Site https://www.energy.gov/lm/chicago-south-illinois-site
Chupadera Mesa, NM, Site https://www.energy.gov/lm/chupadera-mesa-new-mexico-site
Columbus East, OH, Site https://www.energy.gov/lm/columbus-east-ohio-site
Fairfield, OH, Site https://www.energy.gov/lm/fairfield-ohio-site
Granite City, IL, Site https://www.energy.gov/lm/granite-city-illinois-site
Hamilton, OH, Site https://www.energy.gov/lm/hamilton-ohio-site
Indian Orchard, MA, Site https://www.energy.gov/lm/indian-orchard-massachusetts-site
Jersey City, NJ, Site https://www.energy.gov/lm/jersey-city-new-jersey-site
Madison, IL, Site https://www.energy.gov/lm/madison-illinois-site
New York, NY, Site https://www.energy.gov/lm/new-york-new-york-site
Niagara Falls Storage Site Vicinity Properties, NY, Site https://www.energy.gov/lm/niagara-falls-storage-site-vicinity-properties-new-york-site
Oak Ridge, TN, Warehouses Site https://www.energy.gov/lm/oak-ridge-tennessee-warehouses-site
Oxford, OH, Site https://www.energy.gov/lm/oxford-ohio-site
Seymour, CT, Site https://www.energy.gov/lm/seymour-connecticut-site
Springdale, PA, Site https://www.energy.gov/lm/springdale-pennsylvania-site
Toledo, OH, Site https://www.energy.gov/lm/toledo-ohio-site
Tonawanda North, NY, Site Unit 1 https://www.energy.gov/lm/tonawanda-north-new-york-site-unit-1
Tonawanda North, NY, Site Unit 2 https://www.energy.gov/lm/tonawanda-north-new-york-site-unit-2
Wayne, NJ, Site https://www.energy.gov/lm/wayne-new-jersey-site
Windsor, CT, Site https://www.energy.gov/lm/windsor-connecticut-site

Table A-1. Category 1 Sites (continued)

(Typically involves records-related activities and stakeholder support)

MED/AEC Legacy Sites
Ashtabula, OH, Site https://www.energy.gov/lm/ashtabula-ohio-site
Center for Energy and Environmental Research, PR, Site https://www.energy.gov/lm/center-energy-and-environment-research-ceer-puerto-rico-sites
Columbus, OH, Site https://www.energy.gov/lm/columbus-ohio-sites
El Verde, PR, Site https://www.energy.gov/lm/el-verde-puerto-rico-site
General Atomics Hot Cell Facility, CA, Site https://www.energy.gov/lm/general-atomics-hot-cell-facility-california-site
Inhalation Toxicology Laboratory, NM, Site https://www.energy.gov/lm/inhalation-toxicology-laboratory-new-mexico-site
Missouri University Research Reactor, MO, Site https://www.energy.gov/lm/missouri-university-research-reactor-murr-missouri-site
Oxnard, CA, Site https://www.energy.gov/lm/oxnard-california-site
Vallecitos Nuclear Center, CA, Site https://www.energy.gov/lm/vallecitos-nuclear-center-california-site
State Water Quality Standards Site
Geothermal Test Facility, CA, Site https://www.energy.gov/lm/geothermal-test-facility-california-site
Plowshare/Vela Uniform Program
Plowshare/Vela Uniform Sites, NV, Records Only[a] https://www.energy.gov/lm/plowsharevela-uniform-program-sites
Pre-Schooner II, ID, Site https://www.energy.gov/lm/plowsharevela-uniform-program-sites

Note:

[a] Although this site is counted as a single site in the LM *Site Management Guide*, it represents 26 individual sites where activities are limited to records management.

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 or 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											
Bayo Canyon Aggregate Area, NM, Site[d] https://www.energy.gov/lm/bayo-canyon-new-mexico-aggregate-area-and-fusrap-sites	x										x
Laboratory for Energy-Related Health Research, CA, Site https://www.energy.gov/lm/laboratory-energy-related-health-research-lehr-california-site	x	x				x	x		x		x
Nevada Offsites											
Amchitka, AK, Site https://www.energy.gov/lm/amchitka-alaska-site	x				x	x			x		x
Central Nevada Test Area, NV, Site https://www.energy.gov/lm/central-nevada-test-area-cnta-nevada-site	x	x				x			x		x
Gasbuggy, NM, Site https://www.energy.gov/lm/gasbuggy-new-mexico-site			x						x		x
Gnome-Coach, NM, Site https://www.energy.gov/lm/gnome-coach-new-mexico-site	x	x				x			x		x
Rio Blanco, CO, Site https://www.energy.gov/lm/rio-blanco-colorado-site		x	x						x		x
Rulison, CO, Site https://www.energy.gov/lm/rulison-colorado-site		x	x						x		x
Salmon, MS, Site https://www.energy.gov/lm/salmon-mississippi-site		x							x		x
Shoal, NV, Site https://www.energy.gov/lm/shoal-nevada-site	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 or 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]
UMTRCA Sites											
Ambrosia Lake, NM, Disposal Site https://www.energy.gov/lm/ambrosia-lake-new-mexico-disposal-site	x	x						x	x		x
Bluewater, NM, Disposal Site https://www.energy.gov/lm/bluewater-new-mexico-disposal-site	x	x						x	x		x
Burrell, PA, Disposal Site https://www.energy.gov/lm/burrell-pennsylvania-disposal-site	x	x						x	x		x
Canonsburg, PA, Disposal Site https://www.energy.gov/lm/canonsburg-pennsylvania-disposal-site	x	x						x	x		x
Durango, CO, Processing Site https://www.energy.gov/lm/durango-colorado-disposal-and-processing-sites		x							x		x
Durango, CO, Disposal Site https://www.energy.gov/lm/durango-colorado-disposal-and-processing-sites	x	x						x	x		x
Edgemont, SD, Disposal Site https://www.energy.gov/lm/edgemont-south-dakota-disposal-site	x							x			x
Falls City, TX, Disposal Site https://www.energy.gov/lm/falls-city-texas-disposal-site	x	x						x			x
Green River, UT, Disposal Site https://www.energy.gov/lm/green-river-utah-disposal-site	x	x						x			x
Gunnison, CO, Processing Site https://www.energy.gov/lm/gunnison-colorado-disposal-and-processing-sites		x							x		x
Gunnison, CO, Disposal Site https://www.energy.gov/lm/gunnison-colorado-disposal-and-processing-sites	x	x						x	x		x
Lakeview, OR, Processing Site https://www.energy.gov/lm/lakeview-oregon-disposalprocessing-sites		x									x
Lakeview, OR, Disposal Site https://www.energy.gov/lm/lakeview-oregon-disposalprocessing-sites	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 or 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]
UMTRCA Sites (continued)											
L-Bar, NM, Disposal Site https://www.energy.gov/lm/l-bar-new-mexico-disposal-site	x	x			x			x			x
Lowman, ID, Disposal Site https://www.energy.gov/lm/lowman-idaho-disposal-site	x							x			x
Maybell, CO, Disposal Site https://www.energy.gov/lm/maybell-colorado-disposal-site	x							x			x
Maybell West, CO, Disposal Site https://www.energy.gov/lm/maybell-west-colorado-disposal-site	x							x			x
Mexican Hat, UT, Disposal Site https://www.energy.gov/lm/mexican-hat-utah-disposal-site	x				x			x			x
Monument Valley, AZ, Processing Site https://www.energy.gov/lm/monument-valley-arizona-processing-site		x			x				x		x
Naturita, CO, Processing Site https://www.energy.gov/lm/naturita-colorado-disposal-and-processing-sites		x									x
Naturita, CO, Disposal Site https://www.energy.gov/lm/naturita-colorado-disposal-and-processing-sites	x							x			x
Rifle, CO, Processing (Old) Site https://www.energy.gov/lm/rifle-colorado-disposal-site-and-processing-sites		x							x		x
Rifle, CO, Processing (New) Site https://www.energy.gov/lm/rifle-colorado-disposal-site-and-processing-sites		x							x		x
Rifle, CO, Disposal Site https://www.energy.gov/lm/rifle-colorado-disposal-site-and-processing-sites	x	x						x	x		x
Riverton, WY, Processing Site https://www.energy.gov/lm/riverton-wyoming-processing-site		x							x		x
Salt Lake City, UT, Processing Site https://www.energy.gov/lm/salt-lake-city-utah-disposal-and-processing-sites											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 or 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]
UMTRCA Sites (continued)											
Salt Lake City, UT, Disposal Site https://www.energy.gov/lm/salt-lake-city-utah-disposal-and-processing-sites	x							x			x
Sherwood, WA, Disposal Site https://www.energy.gov/lm/sherwood-washington-disposal-site	x	x			x			x	x		x
Shirley Basin South, WY, Disposal Site https://www.energy.gov/lm/shirley-basin-south-wyoming-disposal-site	x	x						x	x		x
Slick Rock, CO, Processing Sites https://www.energy.gov/lm/slick-rock-colorado-disposal-and-processing-sites		x							x		x
Slick Rock, CO, Disposal Site https://www.energy.gov/lm/slick-rock-colorado-disposal-and-processing-sites	x							x			x
Spook, WY, Disposal Site https://www.energy.gov/lm/spook-wyoming-disposal-site	x							x			x
FUSRAP Sites[e]											
Bayo Canyon, NM, Site[d] https://www.energy.gov/lm/bayo-canyon-new-mexico-aggregate-area-and-fusrap-sites											x
Colonie, NY, Site https://www.energy.gov/lm/colonie-new-york-site	x	x				x	x[f]		x[f]		x
New Brunswick, NJ, Site https://www.energy.gov/lm/new-brunswick-new-jersey-site											x
Painesville, OH, Site https://www.energy.gov/lm/painesville-ohio-site											x
Tonawanda, NY, Site https://www.energy.gov/lm/tonawanda-new-york-site											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 or 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]
D&D Sites											
BONUS, PR, Decommissioned Reactor Site https://www.energy.gov/lm/bonus-puerto-rico-decommissioned-reactor-site	x					x					x
Grand Junction, CO, Site https://www.energy.gov/lm/grand-junction-colorado-site	x	x		x		x			x	x	x
Hallam, NE, Decommissioned Reactor Site https://www.energy.gov/lm/hallam-nebraska-decommissioned-reactor-site	x	x				x			x		x
Piqua, OH, Decommissioned Reactor Site https://www.energy.gov/lm/piqua-ohio-decommissioned-reactor-site	x					x			x		x
Site A/Plot M, IL, Decommissioned Reactor Site https://www.energy.gov/lm/site-aplot-m-illinois-decommissioned-reactor-site	x	x				x			x		x
Nuclear Waste Policy Act Section 151 Site											
Parkersburg, WV, Disposal Site https://www.energy.gov/lm/parkersburg-west-virginia-disposal-site	x	x				x			x		x
MED/AEC Legacy Site											
Burris Park, CA, Site https://www.energy.gov/lm/burris-park-california-site	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 or 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]
Plowshare/Vela Uniform Program[g]											
Bronco, CO, Site https://www.energy.gov/lm/plowsharevela-uniform-program-sites											
Pre-Gondola and Trencher, MT, Site https://www.energy.gov/lm/plowsharevela-uniform-program-sites											
Utah, UT, Site https://www.energy.gov/lm/plowsharevela-uniform-program-sites											

Notes:

[a] LM conducts inventories at certain sites 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] Environmental monitoring reports may include the following (some of which provide trending of data such as contaminant time-concentration plots):

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

[c] Geospatial Environmental Mapping System (GEMS) https://gems.lm.doe.gov: 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, geospatial displays, and contaminant time-concentration plots from which trending can be evaluated. Available data may include:

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

[d] The Bayo Canyon Aggregate Area RCRA site is counted with the Bayo Canyon FUSRAP site. For site count purposes, the FUSRAP programmatic framework is designated as the primary regulatory driver.

[e] 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. Site boundaries are provided on GEMS website https://gems.lm.doe.gov and https://www.geoplatform.gov.

[f] This site follows the CERCLA process but is not on the National Priorities List. For the site, the equivalent to a CERCLA Five-Year Review is the Long-Term Periodic Review Report. A site-specific long-term monitoring report will be completed by LM to document future groundwater sampling events.

[g] The Plowshare/Vela Uniform Program sites do not require LTS&M activities and thus have no reporting requirements. Activities consist of assessing site conditions, eliminating remaining environmental impacts and safety hazards, managing site records, responding to stakeholder inquiries, and maintaining information on the program fact sheet and website.

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.energy.gov/lm/fernald-preserve-ohio-site	x	x	x	x	x	x	x		x	x	x	x
Monticello, UT, Processing Site https://www.energy.gov/lm/monticello-utah-disposal-and-processing-sites	x	x				x	x				x	x
Monticello, UT, Disposal Site https://www.energy.gov/lm/monticello-utah-disposal-and-processing-sites	x	x				x	x				x	x
Mound, OH, Site https://www.energy.gov/lm/mound-ohio-site	x	x	x		x	x	x			x	x	x
Pinellas County, FL, Site https://www.energy.gov/lm/pinellas-county-florida-site		x									x	x
Rocky Flats Site, CO https://www.energy.gov/lm/rocky-flats-site-colorado	x	x		x	x	x	x		x		x	x
Weldon Spring Site, MO https://www.energy.gov/lm/weldon-spring-missouri-site	x	x			x	x	x				x	x

Table A-3. Category 3 Sites (continued)

(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]
UMTRCA Sites												
Grand Junction, CO, Processing Site https://www.energy.gov/lm/grand-junction-colorado-disposal-and-processing-sites	x	x				x					x	x
Grand Junction, CO, Disposal Site https://www.energy.gov/lm/grand-junction-colorado-disposal-and-processing-sites	x	x						x			x	x
Shiprock, NM, Disposal Site https://www.energy.gov/lm/shiprock-new-mexico-disposal-site	x	x						x			x	x
Tuba City, AZ, Disposal Site https://www.energy.gov/lm/tuba-city-arizona-disposal-site	x	x						x			x	x

Notes:

[a] LM conducts chemical inventories at certain sites 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:

- Verification monitoring reports
- Groundwater monitoring reports
- Hydrologic and natural gas sampling and analysis reports
- Federal Facility Agreement quarterly reports

[c] Geospatial Environmental Mapping System (GEMS) https://gems.lm.doe.gov: 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, geospatial displays, and time-concentration plots from which trending can be evaluated. Available data may include:

- Historical air monitoring locations
- Analytical groundwater and surface water data
- Groundwater depths and elevations
- Well logs and well construction data
- Georeferenced boundaries
- Site physical features
- Sampling locations
- Site photos

[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 2019 Groundwater Monitoring Program Summary

Site Name	Rad Monitoring[a]	Nonrad 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-*p*-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-*p*-dioxin	93[e]	0	N/A
Laboratory for Energy-Related Health Research, CA, Site	X	X	Aluminum, americium-241, benzene, carbon-14, cesium-137, chlordane, chloroform, chromium, 1,1-dichloroethane, dieldrin, formaldehyde, gross beta, iron, manganese, mercury, molybdenum, nickel, nitrates, radium-226, selenium, silver, strontium-90, uranium-238, zinc	9	0	N/A
Monticello, UT, Disposal and Processing Sites	X	X	Arsenic, gross alpha activity, gross beta, isotopic uranium, manganese, molybdenum, nitrate, selenium, uranium, vanadium	157	0	N/A
Mound, OH, Site	X	X	Tetrachloroethene, trichloroethene, tritium, vinyl chloride, *cis*-1,2-dichloroethene, *trans*-1,2-dichloroethene	54	0	N/A
Pinellas County, FL, Site		X	Trichloroethene, vinyl chloride, 1,1-dichloroethene, 1,4-dioxane, *cis*-1,2-dichloroethene, *trans*-1,2-dichloroethene	122	0	N/A
Rocky Flats Site, CO	X	X	Volatile organic compounds, semivolatile organic compounds, metals, plutonium, americium, uranium, nitrate (for a detailed list of COCs, see the site webpage)	88	0	N/A
Weldon Spring Site, MO	X	X	Nitrate, nitrobenzene, trichloroethene, uranium, 1,3-dinitrobenzene, 2,4-dinitrotoluene, 2,6-dinitrotoluene, 2,4,6-trinitrotoluene	106	0	N/A

Table A-4. Calendar Year 2019 Groundwater Monitoring Program Summary (continued)

Site Name	Rad Monitoring[a]	Nonrad Monitoring[b]	COCs[c]	Active Wells	POC Wells[d]	Exceedance at POC Wells
Nevada Offsites						
Central Nevada Test Area, NV	X		Carbon-14, iodine-129, tritium	10	9	No
Gasbuggy, NM, Site	X		Tritium	3	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	3	0	N/A
Rulison, CO, Site	X		Gamma-emitting nuclides, tritium	1	0	N/A
Salmon, MS, Site	X	X	*Cis*-1,2- dichloroethene, *trans*-1,2-dichloroethene, trichloroethene, tritium, vinyl chloride	32	0	N/A
Shoal, NV, Site	X	X	Carbon-14, iodine-129, tritium, isotopic uranium, elemental uranium, and gross alpha	13	9	No
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[f]
Durango, CO, Disposal Site		X	Molybdenum, selenium, uranium	9	3	No
Durango, CO, Processing Site		X	**Cadmium**, **manganese**, molybdenum, **selenium**, **sulfate**, **uranium**	14	8	Yes[g]
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**	21	6	Yes[h]
Gunnison, CO, Disposal Site		X	Calcium, chloride, iron, magnesium, manganese, potassium, sodium, sulfate, total dissolved solids, uranium	16	6	No

Table A-4. Calendar Year 2019 Groundwater Monitoring Program Summary (continued)

Site Name	Rad Monitoring[a]	Nonrad Monitoring[b]	COCs[c]	Active Wells	POC Wells[d]	Exceedance at POC Wells
UMTRCA Sites (continued)						
Gunnison, CO, Processing Site		X	**Manganese**, **uranium**	28	26	Yes[g]
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	8	N/A
Rifle, CO Processing (New) Site		X	Arsenic, molybdenum, nitrate as nitrogen, selenium, uranium, vanadium	16	4	No
Rifle, CO Processing (Old) Site		X	Selenium, uranium, vanadium	8	8	No
Riverton, WY, Processing Site		X	Manganese, **molybdenum**, sulfate, **uranium**	47	47	Yes[g]
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	132	0	N/A
Shirley Basin South, WY, Disposal Site	X	X	Cadmium, chloride, chromium, lead, nickel, nitrate + nitrite, radium-226, **radium-228**, selenium, **sulfate**, thorium-230, **total dissolved solids**, uranium	14	4	Yes[i]
Slick Rock, CO, Processing Site	X	X	Benzene, manganese, **molybdenum**, **nitrate**, radium-226, radium-228, **selenium**, toluene, **uranium**	13	13	Yes[g]
Tuba City, AZ, Disposal Site		X	**Molybdenum**, **nitrate**, **selenium**, **uranium**	124	7	Yes[j]
FUSRAP Sites						
Colonie, NY, Site		X	*Cis*-1,2-dichloroethene, **tetrachloroethene**, trichloroethene, vinyl chloride	7	7	Yes[k]
D&D Sites						
Grand Junction, CO, Site		X	Manganese, molybdenum, selenium, sulfate, **uranium**	7	7	Yes[g]
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

Table A-4. Calendar Year 2019 Groundwater Monitoring Program Summary (continued)

Site Name	Rad Monitoring[a]	Nonrad Monitoring[b]	COCs[c]	Active Wells	POC Wells[d]	Exceedance at POC Wells
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] Radiation absorbed dose (RAD) monitoring refers to groundwater sampling for radiological analytes (including uranium isotopes).

[b] Nonrad 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 and information 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) including contaminant time-concentration plots from which trending can be evaluated. See Table A-5 for data on COC exceedances at UMTRCA processing sites and D&D sites.

[e] The number of wells reported includes non-DOE-owned wells that are part of the monitoring program due to the location of the contaminant plume.

[f] Canonsburg site: Regulatory framework provides for alternative concentration levels for monitoring of COCs, but there were no exceedances that met these criteria. Detailed monitoring data can be found in the *2019 Annual Site Inspection and Monitoring Report for Uranium Mill Tailings Radiation Control Act Title I Disposal Sites* (March 2020).

[g] See Table A-5 for exceedances at UMTRCA processing sites and D&D sites.

[h] Green River site: *2019 Annual Site Inspection and Monitoring Report for Uranium Mill Tailings Radiation Control Act Title I Disposal Sites* (March 2020).

[i] Shirley Basin South site: *2019 Annual Site Inspection and Monitoring Report for Uranium Mill Tailings Radiation Control Act Title II Disposal Sites* (December 2019).

[j] Tuba City site: *2019 Annual Site Inspection and Monitoring Report for Uranium Mill Tailings Radiation Control Act Title I Disposal Sites* (March 2020).

[k] The Colonie site, transitioned to LM in 2019. The exceedance of tetrachloroethene above the regulatory limit in 2019 was reported by the transferring agency, USACE. A site-specific long-term monitoring report will be completed by LM to document future groundwater sampling events.

Abbreviation:

N/A = not applicable

Table A-5. Data for COC Exceedances at UMTRCA Processing Sites and D&D Sites

Site Name	COC	Result[a] (mg/L)	Limit[b] (mg/L)	Analytical Data
Durango, CO, Processing Site	Cadmium	0.031	0.01	https://gems.lm.doe.gov/#site=DUP
	Manganese	4.0	1.7	
	Selenium	0.059	0.05	
	Sulfate	2900	1500	
	Uranium	1.3	0.044	
Gunnison, CO, Processing Site	Manganese	4.2	1.60	https://gems.lm.doe.gov/#site=GUP
	Uranium	0.73	0.044	
Grand Junction, CO, Site (D&D Site)	Uranium	0.46	0.044	https://gems.lm.doe.gov/#site=GJO
Riverton, WY, Processing Site	Molybdenum	1.3	0.1	https://gems.lm.doe.gov/#site=RVT
	Uranium	1.9	0.03	
Slick Rock, CO, Processing Site	Molybdenum	2.2	0.1	https://gems.lm.doe.gov/#site=SRW
	Nitrate	220	44	
	Selenium	3.9	0.01	
	Uranium	0.087	0.044	

Notes:

[a] Result represents maximum concentration detected.

[b] Regulatory limits are defined in the following site-specific documents and may be a combination of risk-based limits, maximum concentration limits, alternate concentration limits, or other:

- Durango processing site: *Ground Water Compliance Action Plan for the Durango, Colorado, UMTRA Project Site* (February 2008).
- Gunnison processing site: *Final Groundwater Compliance Action Plan for the Gunnison, Colorado, Processing Site* (April 2010).
- Grand Junction site: *Long-Term Surveillance and Maintenance Plan for the Grand Junction, Colorado, Site* (June 2006).
- Riverton site: *Final Ground Water Compliance Action Plan for the UMTRA Project Site at Riverton, Wyoming* (February 1998).
- Slick Rock processing sites: *Draft Final Ground Water Compliance Action Plan for the Slick Rock, Colorado, Processing Sites* (September 2006).

Abbreviation:

mg/L = milligram per liter

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