



Summary of Annual Site Environmental Reports

Calendar Year 2020

LMS/S14598



Cover photo captions:

Top Left: Big brown bats BCI photo by Shawn Thomas

LM works to keep habitats safe for bats and other wildlife.

Middle Left: Russian Knapweed Plant

Invasive species like Russian knapweed are controlled along LM's uranium lease tracts.

Bottom Left: DRRP-Dolores River View

LM helps to manage invasive species along the banks of Colorado's Dolores River to create a healthier ecosystem.

Bottom Right: Cave Salamander

A state-endangered cave salamander at LM's Fernald Preserve, Ohio, Site.

Public and Stakeholder Feedback

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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
CDPHE	Colorado Department of Public Health and Environment
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	<i>Code of Federal Regulations</i>
COC	contaminant of concern
CWA	Clean Water Act
CXE	Categorical Exclusion Evaluation
D&D	Decontamination and Decommissioning
DOE	U.S. Department of Energy
DRUM	Defense-Related Uranium Mines
EA	Environmental Assessment
EISA	Energy Independence and Security Act
EMS	Environmental Management System
EO	Executive Order
EPA	U.S. Environmental Protection Agency
EPCRA	Emergency Planning and Community Right-to-Know Act 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
GEMS	Geospatial Environmental Mapping System
HSWA	Hazardous and Solid Waste Amendments

ISO	International Organization for Standardization
LEHR	Laboratory for Energy-Related Health Research
LLRW	low-level radioactive waste
LM	Office of Legacy Management
LMBC	Legacy Management Business Center
LMFSC	Legacy Management Field Support Center
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
NLN	National Laboratory Network
NPDES	National Pollutant Discharge Elimination System
NRC	U.S. Nuclear Regulatory Commission
NWPA	Nuclear Waste Policy Act
ODNR	Ohio Department of Natural Resources
Ohio EPA	Ohio Environmental Protection Agency
PFAS	per- and polyfluorinated alkyl substances
PFOA	perfluorooctanoic acid
PFOS	perfluorooctane sulfonate acid
POC	point of compliance
ppt	parts per trillion
P&T	pump-and-treat
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
USFWS	U.S. Fish and Wildlife Service
VOC	volatile organic compound
V&V	verification and validation

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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 2021 *Guidance for the Preparation of the 2020 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. LM has opted for this scaled-down report (alternative 1) to meet the intent of DOE Order 231.1B Admin Chg 1 and provide a summary of LM's programmatic and site-specific environmental activities for calendar year 2020. 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 ASER Reporting and the Ongoing COVID-19 Pandemic

During the reporting period, many LM operations were temporarily and intermittently disrupted due to the COVID-19 pandemic and resulting safety guidelines enacted by the Centers for Disease Control and Prevention, DOE, and state and local health departments. LM instituted maximum telework policies in March 2020 that continued through the end of the year and identified essential personnel for minimum facility operations and field operations to eliminate disruptions to the mission. LM was able to adapt quickly and instituted new safety procedures to ensure field staff could continue to fulfill LM's mission, stay healthy and safe, and also observe federal, tribal, state and local COVID-19 guidelines. The impacts to fulfilling requirements varied by site depending on the applicable guidelines. LM worked with federal and state regulators when necessary to modify or adjust monitoring and maintenance requirements that were planned to occur in 2020. Specific disruptions are discussed throughout this report within their particular topic area.

1.2 Public and Stakeholder Outreach and Feedback

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, including proactive community, public, and stakeholder engagement and outreach.

Contact public.affairs@lm.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 2020, LM managed the long-term care of 101 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 January 2021 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; additional information on potential incoming sites is in the *LM Site Management Guide* along with expected transfer years.

Table 1. LM Site Count by Regulatory or Programmatic Framework

Regulatory or Programmatic Framework	Site Count Through December 2020
CERCLA/RCRA	8
Nevada Offsites	10
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	101

Note:

Site counts are based on the January 2021 *LM Site Management Guide*.

Abbreviations:

- AEC = U.S. Atomic Energy Commission
- CERCLA = Comprehensive Environmental Response, Compensation, and Liability Act
- D&D = Decontamination and Decommissioning
- FUSRAP = Formerly Utilized Sites Remedial Action Program
- MED = Manhattan Engineer District
- NWPA = Nuclear Waste Policy Act
- RCRA = Resource Conservation and Recovery Act
- UMTRCA = Uranium Mill Tailings Radiation Control Act

2.1 Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)/Resource Conservation and Recovery Act (RCRA) Sites

LM managed eight sites during the reporting period where remediation was conducted in accordance with CERCLA, 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 10 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. Three 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, 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 operation, 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 that an initial 46 would be eligible for remediation under FUSRAP. Additional sites were determined to be eligible after the program was originally established, and several otherwise ineligible sites were designated for remediation by Congress. DOE remediated 25 sites from 1974 to 1997, when Congress (through the Energy and Water Development Appropriations Act for fiscal year [FY] 1998) directed the U.S. Army Corps of Engineers (USACE) to assume responsibility for the remediation of the remaining FUSRAP sites. USACE's remediation is subject to the administrative, procedural, and regulatory provisions of CERCLA and the National Oil and Hazardous Substances Pollution Contingency Plan.

LM determines whether a site is potentially eligible for FUSRAP, refers sites to USACE for eligibility determination, and manages long-term stewardship of remediated sites. USACE maintains each site for 2 years after remediation is complete and then transfers the long-term stewardship responsibilities of the site to LM. Most FUSRAP long-term stewardship is limited to managing site records and responding to stakeholder inquiries, because most sites were

remediated for unrestricted use. Some FUSRAP long-term stewardship includes surveillance and maintenance activities, including maintaining institutional controls and conducting regular site inspections. LM managed 34 FUSRAP sites during the reporting period; the number will increase as USACE completes the cleanup of remaining sites.

2.5 Decontamination and Decommissioning (D&D) Sites

DOE established the 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 Nuclear Waste Policy Act (NWPA) Section 151 Site

Under the NRC Site Decommissioning Management Program, owners can transfer certain sites with low-level radioactive contamination remaining after site remediation to the federal government under Section 151 of the NWPA. LM managed one NWPA Section 151 site for LTS&M during the reporting period.

2.7 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

The Plowshare Program (1957–1975) was designed to 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).

The Vela Uniform Program (1963–1971) was designed to develop technologies for detecting underground or underwater nuclear detonations. Several tests were conducted using nuclear and nonnuclear explosives to analyze seismic activities associated with different types of explosives or other seismic activities such as earthquakes.

More than 150 Plowshare and Vela Uniform Program proposed project sites were previously identified by the DOE Office of Environmental Management. Most of these proposed projects never occurred; only 30 sites had activities with the potential for remaining liabilities. These 30 sites were grouped by purpose: Non-Nuclear Explosive Tests, Non-Nuclear Civil Works Projects, Canceled Nuclear Tests (some activities occurred but planned nuclear tests were

canceled), and other (geothermal energy experiment). LM evaluated these sites for potential environmental liabilities and safety hazards before accepting them for long-term management. Following the completion of maintenance activities, LM's management of the sites will include preserving records and responding to public inquiries. LM managed five sites during the reporting period. Four are individual sites, and one consisted of records-only management of 166 Plowshare and Vela Uniform projects.

The Plowshare and Vela Uniform Program sites do not require LTS&M activities, only temporary reporting requirements (e.g., revegetation monitoring until success criteria are achieved). Activities may include 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. In 2020, no field activities were conducted at the Pre-Gondola and Trencher, Montana, Site; Pre-Schooner II, Idaho, Site; or the Utah, Utah, Site.

2.10 Additional LM Programs and Facilities

In addition to postclosure site responsibilities, 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.
 - Grand Junction, Colorado, Site.
 - Secondary facilities are in:
 - Grants, New Mexico.
 - George West, Texas.
 - 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 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 FY 2013. LM implements the program by conducting verification and validation (V&V) 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. The DRUM Program also partners with other agencies to complete mine safeguarding activities, including filling or blocking hazardous mine openings by 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>.

- **Applied Studies and Technologies (AS&T) Program:** An overriding LM goal is to “incorporate advances in science and technology to improve our capabilities” in advancing protection of human health and the environment. AS&T is a core component of LM’s efforts to fulfill this goal by incorporating improvements in scientific understanding and technology applications with management strategies to decrease long-term costs. AS&T conducts studies to fulfill these objectives and to continually improve the quality of LTS&M and the cost effectiveness, sustainability, and protectiveness of environmental remedies at LM sites. These studies include working with other federal agencies, the environmental community, universities, national laboratories, and the international scientific community so that LM can stay informed about emerging engineering and scientific advancements that support ongoing LM studies and promote data sharing, discourse, and scientific achievements.

— Additional information is available at <https://www.energy.gov/lm/services/applied-studies-and-technology-ast>.

- **LM National Laboratory Network (NLN) Program:** This program provides the means to collaborate with DOE’s national laboratories and LM’s strategic partner (the Legacy Management Support [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 signed a Memorandum of Understanding formally establishing Savannah River National Laboratory as the lead national laboratory providing technical support to LM’s management of remediated 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 facilities in the following locations:

— Fernald Preserve, Ohio

— LM Field Support Center (LMFSC) at Grand Junction, Colorado

— Monticello, Utah

- LMBC at Morgantown, West Virginia
- Pinellas County, Florida
- Tuba City, Arizona
- Washington, D.C.
- Weldon Spring, Missouri
- LM Operations Center at Westminster, Colorado
- Window Rock, Arizona

3.0 Summary of General Environmental Reporting

3.1 Oversight

DOE assigns an LM site manager, program manager, or facility 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. This LM manager reviews all reports associated with his or her respective sites or 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 49 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.

The following LM facility and program activities were performed in 2020 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

- Prepared the annual status and activities report summarizing LM activities for the ULP during the calendar year.
- Continued providing input to and review of the NEPA Environmental Assessment (EA) for Reclamation of the Burro Mines Complex in San Miguel County, Colorado.
- Continued coordinating with the Colorado State Historic Preservation Officer (SHPO) as part of the Section 106 process evaluation of the proposed Reclamation of the Burro Mines Complex in San Miguel County, Colorado.
- Began preparing the engineering design for Reclamation of the Burro Mines Complex.
- Reviewed four reclamation plans and provided comments back to lessee.

3. DRUM Program activities
 - Completed reconciliation, inventory, and field V&V of 417 BLM and U.S Forest Service mines in Colorado and Utah. Numbers were fewer than the previous year due to COVID-19 restrictions set in place.
 - Prepared summary reports for each mine or group of mines to be transmitted to the appropriate agency.
 - Partnered with other agencies to complete mine safeguarding activities that include filling or blocking hazardous mine openings (e.g., 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.
4. Plowshare and Vela Uniform Program activities
 - Conducted historical research to obtain additional information about the sites.
 - Conducted well abandonment and reclamation activities at the Bronco, Colorado, Site in accordance with BLM requirements.
5. AS&T Program activities
 - Optimized current LM operations and advancing technological applications.
 - Supported collaboration between LM and the NLN.
 - Prepared 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 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)
- *Environmental Management System 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:

- *2021 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).
- *Annual 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:

- LM received the Electronic Product Environmental Assessment Tool (EPEAT) Purchaser Award for the sixth 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.
- LM was awarded the 2020 Federal Facility Excellence in Site Reuse Award for the Weldon Spring Site. This award recognizes noteworthy restoration and reuse of federal facility sites through innovative thinking and cooperation among federal agencies, states, tribes, local partners, and developers.

5.0 Summary of Environmental Compliance

The following subsections summarize compliance with applicable regulations and the related 2020 reporting. Because LM manages sites under different regulatory frameworks, postclosure environmental requirements vary based on 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 (e.g., 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 CERCLA sites regulated by the U.S. Environmental Protection Agency (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 remaining residual contamination to evaluate whether the remedy at the site remains protective of human health and the environment.

- CERCLA Five-Year Reviews were initiated in calendar year 2020 for the following:
 - Laboratory for Energy-Related Health Research (LEHR), California, Site
 - Fernald Preserve, Ohio, Site
 - Mound, Ohio, Site
 - Weldon Spring Site

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 is 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 from LMFSC in Grand Junction, CO was taken to an approved local, county-run hazardous waste collection facility for disposal.
- An active RCRA HSWA corrective action permit issued by the state of Florida is maintained for the Pinellas County, Florida, Site. The permit includes requirements for remedial action at the site under the state's Global Risk-Based Corrective Action regulations.

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 utilizes the MSDSONline system for tracking chemicals and Safety Data Sheets at LM sites and facilities.
- An internal EPCRA SharePoint site is used to maintain chemical inventory reports as well as the required documentation (reporting threshold calculations, documentation of exemptions, etc.) for evaluating the applicability of EPCRA reporting. EPCRA Tier II reports are used to provide state and local officials and the public with a list of specific information on potential hazards stored and used at a site. EPCRA Tier II reports were submitted for the following sites and facilities:
 - LMFSC for the storage and use of lead-acid batteries
 - Rocky Flats Site, Colorado, for the storage and use of lead-acid batteries
 - LMBC for the storage of diesel fuel in an emergency power generator aboveground storage tank and for the storage and use of lead-acid batteries

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 did not generate or dispose of any TSCA regulated waste in 2020.

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
 - AEA Section 11e. (2) byproduct 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. On December 27, 2020, the “Consolidated Appropriations Act, 2021” was signed by President Trump reauthorizing the disposal cell to remain open until it reaches capacity or until September 30, 2031, whichever comes first. LM will continue to operate the disposal cell and plan closure activities to meet the new extended timeline.
 - Significant revisions of the Grand Junction disposal site’s waste acceptance criteria were completed in 2020. The revised waste acceptance criteria clarify the radioactive waste types that LM can accept for disposal.
 - Radioactive materials from UMTRCA Title I vicinity properties in Grand Junction and the UMTRCA Title I Rifle, Colorado, Disposal Site were disposed at the Grand Junction disposal site.
- Weldon Spring Site: AEA Section 11e. (2) byproduct material associated with legacy wastes (pieces of excavated piping and old polyethylene tank) was shipped to Energy Solutions at Clive, Utah.
- Rocky Flats Site: LLRW associated with the original landfill maintenance project was shipped to Energy Solutions at Clive, Utah.

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. LM completed the following activities in 2020 under the CAA:

- A West Virginia General Permit 65 was obtained to operate the replacement LMBC emergency generator.

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 2020, multiple LM sites maintained NPDES permits. These NPDES permits include discharge permits and stormwater permits as described below.

- At the Fernald Preserve, stormwater runoff sampling of nonradiological pollutants is conducted, and effluent discharges are treated in compliance with a NPDES permit administered by the state.
 - An NPDES permit renewal application was submitted to the Ohio Environmental Protection Agency (Ohio EPA) in 2019 to support the NPDES permit that expired in 2020.
- Ohio EPA's NPDES Stormwater Permitting allows for an exclusion if a condition of no exposure exists at an industrial facility. The criteria are met at the Fernald Preserve site; LM submitted an application for a conditional exclusion from stormwater to the state of Ohio in 2020. This application was approved in 2020 and will go in effect when the new NPDES permit is approved. At the Mound site, an NPDES permit covers discharge of treated groundwater under a CERCLA authorization demonstrating compliance with the CWA. Operation of the pump-and-treat (P&T) Record of Decision remedy for Operable Unit 1 was shut off on September 15, 2014, with regulatory approval, to allow for an undisturbed evaluation of treatment zones during the enhanced attenuation field demonstration involving the injection of edible vegetable oil into the groundwater. No discharge has occurred since the P&T was shut off.
 - 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 an 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 2022.

- At the Weldon Spring Site, 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 occurred 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 plan applies to an 894-gallon diesel fuel aboveground storage tank associated with the emergency generator.

CWA Stormwater Management and EISA Section 438: A stormwater management program was established by the CWA to reduce runoff and improve water quality. An NPDES permit for stormwater discharges associated with construction activity is required for projects disturbing 1 acre or more. Under Section 438 of the EISA, federal agencies are required to reduce stormwater runoff from federal facility development and redevelopment projects with a footprint exceeding 5000 square feet to maintain or restore predevelopment hydrology. A federal facility is any building constructed, renovated, leased, or purchased by the federal government. Federal agencies can comply using a variety of stormwater management practices often referred to as "green infrastructure" or "low impact development" practices, including, for example, reducing impervious surfaces and using vegetative practices, porous pavements, cisterns, and green roofs.

LM evaluated all federal facility building development and redevelopment projects to ensure compliance with EISA Section 438, if applicable. There was one federal facility development or redevelopment project, at the Weldon Spring Site, meeting the EISA Section 438 criteria in 2020.

LM evaluates all construction projects to ensure that NPDES permit coverage is obtained for stormwater discharges associated with construction activity disturbing 1 acre or more and that construction and postconstruction stormwater management standards are met and erosion controls implemented as required by the NPDES permit. The following projects required stormwater permitting due to construction activities in 2020:

- At the Rocky Flats Site, LM managed stormwater 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 stormwater permitting. EPA and the Colorado Department of Public Health and Environment (CDPHE) approved this approach. Soil disturbances are controlled by institutional controls managed through the *Rocky Flats Legacy Management Agreement*.

- At the Fernald Preserve, LM managed sitewide and construction-related stormwater in accordance with the *Fernald Preserve, Fernald, Ohio, Storm Water Pollution Prevention Plan* (LMS/FER/S03161) and the current Fernald Preserve NPDES permit.
- At the Weldon Spring Site, a new building was under construction to replace the existing Interpretive Center and site office trailer. USACE operated within an interagency agreement with DOE to coordinate the building design and construction. The stormwater runoff was evaluated in accordance with Section 438 of EISA, and county and state stormwater permits were attained to address the land disturbance.
- At the Plowshare/Vela Uniform Program Bronco site, coverage under the Colorado Discharge Permit System General Permit for Stormwater Discharges Associated with Construction Activity was obtained for construction activities associated with a well abandonment project. Construction activities took place between October and December 2020. The permit will remain active until revegetation is complete.

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. As part of the agreement, the water is treated by ion exchange prior to transport to decrease the uranium concentrations below the 30 micrograms per liter drinking water standard.
- 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.

Per- and Polyfluorinated Alkyl Substances (PFAS) and Other Emerging Contaminants: Emerging contaminants, including PFAS, present unique issues and challenges due to their persistence in the environment, resistance to typical environmental degradation processes, and potential adverse effects on the environment and human health. PFAS are a group of over 4000 compounds that have more than 200 uses, including aqueous film-forming foam, metal processing, uranium isotope separation, and other Manhattan Engineer District programs. Additionally, PFAS were used in household products, floor sealants, plumber's tape, pipe dope, high-density polyethylene containers, and many other consumer products. Perfluorooctanoic acid (PFOA) and perfluorooctane sulfonate (PFOS) are the two most common PFAS and have been designated by EPA as emerging contaminants of concern at federal facilities. Additional emerging contaminants of concern which may be present at LM sites include 1,4-dioxane and vapor intrusion chemicals. Regulatory approaches for emerging contaminants are in development at the federal and state regulatory agency level. EPA and states have consulted with federal facilities regarding unique issues and challenges related to these 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 related to emerging contaminants occurred during 2020. As requested by CDPHE under RCRA and the Colorado Hazardous Waste Act, a report was submitted to CDPHE in April 2020 that summarized results of limited sampling of groundwater, surface water, untreated influent, and seepage at the Rocky Flats Site. The sampling was performed in 2019 and focused on PFOA and PFOS. Concentrations of one or both constituents were found to exceed the 2016 EPA Health Advisory level (70 nanograms per liter or parts per trillion [ppt], combined PFOA and PFOS) at one well in the area of the former fire department/oil burn pit (70–120 ppt for PFOA and 240–310 ppt for PFOS) and at the influent to a treatment system for seepage from a former landfill (59–69 ppt for PFOA and 20–23 ppt for PFOS). In September 2020, CDPHE requested additional PFAS sampling at the Rocky Flats Site. Through a consultation in November 2020 between DOE, CDPHE, and EPA it was agreed that the PFAS sampling effort at the Rocky Flats Site would be restarted; the sampling locations increased from the initial 8 locations to 12 locations; sampling would be performed quarterly for 2 years (i.e., 8 quarters); and the analytical suite expanded to over 25 PFAS, including PFOA and PFOS. A new sampling analysis plan for this work was requested by CDPHE, and it is scheduled to be forwarded to CDPHE for review and approval in January 2021.
- 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 contaminant PFAS 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 in December 2019. To date, no sampling for these emerging contaminants has occurred at the Fernald Preserve. PFAS will be addressed in the fifth CERCLA Five-Year Review due April 1, 2021.
- Mound Site: LM conducted vapor intrusion assessment activities in accordance with the recommendation in the September 2016 CERCLA *Fourth Five-Year Review for the Mound, Ohio, Site, Miamisburg, Ohio*. In 2019, both EPA and Ohio 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 a Phase II Sampling and Analysis Plan (SAP) and a Quality Assurance Project Plan (QAPP), which were submitted for regulatory review in 2019 and reissued for final review in 2020. Ohio EPA and EPA comments were received in October and December 2020, respectively. A revised SAP and QAPP and sampling activities are expected to begin in the summer of 2021 and early 2022.
- Colonie, New York, FUSRAP Site: Historical industrial operations included electroplating operations that potentially used PFAS.

The following LM sites have conducted records searches or investigations following requests from state regulators:

- Mound site: A report summarizing a records search was submitted to Ohio EPA and EPA in 2018 indicating no PFOA or PFOS were used at the site; no further action was required at the time of report approval.
- Pinellas County site: A records search requested by the Florida Department of Environmental Protection in 2019 indicated no documented use of PFAS at the site; no further action was required at the time.
- LEHR site: A PFAS records search indicated no records of current or historical PFAS usage. A PFAS sampling plan was suggested by the state regulator in 2019 but was found to be premature, and no further action was required at the time. In response to the draft Second Five Year Review report, EPA revisited the issue of emerging contaminants and requested clarification on whether 1,4-dioxane or PFAS were potential groundwater issues affecting protectiveness. The report was revised to include a recommendation for a one-time sampling event in 2021 for 1,4-dioxane, and the response to EPA reiterated the lack of recorded historical PFAS usage at the site.
- Weldon Spring Site: Vapor intrusion constituents were reviewed and presented in 2016 during the CERCLA Five Year Review. It was determined there was no potential for concern.

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 *LMS Environmental Compliance Regulatory Review Quarterly Report*. None of the work conducted at LM sites in 2020 required a floodplain assessment or impacted any floodplains.

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 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.
- 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). 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>. The following is a summary of NEPA documents either completed or in progress during the reporting period:

- 20 CXEs were completed and approved
- A Programmatic EA and Finding of No Significant Impact was prepared by LM for Grazing Activities at Office of Legacy Management Sites
- The following EAs were in progress:
 - Burro Mines Complex: Argonne National Laboratory continued preparing an EA on behalf of LM for the proposed reclamation of the Burro Mines, which is managed under the ULP
 - Piqua, Ohio, Decommissioned Reactor Site: USACE is preparing an EA on behalf of LM for the proposed demolition of the buildings at the Piqua site
 - Shiprock, New Mexico, Disposal Site: LM is preparing an EA for proposed groundwater compliance actions at the Shiprock site
- Additionally, as the applicant for proposed land withdrawals, LM participated in preparing EAs for and in coordination with the BLM for the following sites:
 - Durita, Colorado, Disposal Site—in progress
 - Split Rock, Wyoming, Disposal Site—in progress
 - Bear Creek, Wyoming, Disposal Site—on hold by BLM
 - Shirley Basin South Creek, Wyoming, Disposal Site—on hold by BLM

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 habitats. 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 that could be affected by LM activities. 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, LM initiates a

Section 7 consultation with USFWS and, in cases of a formal consultation, prepares a Biological Assessment. Additional consultation with tribal authorities may be required on tribal lands.

Threatened or endangered species consultations occurred at the following LM sites in 2020:

- Bronco, Colorado, Site: A sensitive plant survey was performed. Surveys mapped populations of the threatened Dudley Bluffs twinpod several hundred feet from the project area, and LM determined that the well abandonment project would not affect this species.
- Fernald Preserve: Staff performed a survey for running buffalo clover, with none found, before installing survey monuments. A 5-year agreement with the USFWS and the Cincinnati Zoo to introduce the federally endangered American burying beetle to the Fernald Preserve continued and extends through 2022. Monitoring for the beetles took place in early 2020, but, due to reduced site staffing in the spring of 2020 in response to the COVID-19 pandemic, no beetles were released during 2020.
- Riverton, Wyoming, Processing Site: A sensitive plant survey was performed in 2020 to confirm that no listed plant species could be affected by drilling associated with groundwater studies. No listed plants were found.
- Rocky Flats Site: Consultations and notifications associated with project activities were completed in accordance with the site's Programmatic Biological Assessment.
- Shiprock site: LM began an informal consultation process with USFWS and the Navajo Nation for several listed species including Mesa Verde cactus, Colorado pikeminnow and its designated critical habitat, razorback sucker and its designated critical habitat, and southwestern willow flycatcher. LM plans to remove a groundwater treatment system and utility pipelines in Many Devils Wash near the site. The project design will minimize impacts to these listed species. Formal consultation is planned for 2021.
- Shirley Basin South, Wyoming, Disposal Site: A baseline vegetation survey for sensitive plant survey was performed and it was confirmed the Ute ladies'-tresses and western fringed prairie orchid would not be affected by the regenerative grazing study.

Invasive Species Management: In accordance with the Plant Protection Act of 2000, 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 western 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 2020, LM treated 41 different species of noxious weeds on 510.5 acres across 29 different sites. From 2019 to 2020, there was:

- Decreased acreage of noxious weeds sprayed at 9 sites
- Increased acreage sprayed at 10 sites
- No change in acreage sprayed at 10 sites

Canada thistle (*Cirsium arvense*), which occurred at 12 sites, was the most widespread noxious weed treated. Both hardheads (*Acroptylon repens*) and musk thistle (*Carduus nutans*), which occurred at 7 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 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 best management practices (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. Due to COVID-19 restrictions, field staff were not onsite during nesting season. No permit was issued in 2020 because no eggs were added and no nests were removed.
- 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.

- BMPs were incorporated into DRUM Program field operations plans to avoid impacts to migratory birds and avoid specific field activities during bald and golden eagle nesting seasons.
- Bald and golden eagle nesting surveys were conducted at the Riverton, Wyoming, Processing Site to ensure that planned activities would not disturb them. No nests were found within 0.5 mile of the project area.

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 six times in 2020. LM completed the majority of these consultations in 2020. The low number of consultations reflects the downturn in field activity that was experienced in 2020 due to COVID-19 pandemic related restrictions.

- Some projects required consultation with both a SHPO and a Tribal Historic Preservation Officer (THPO) or tribal representatives. Consultation supporting the proposed Burro Mines Complex reclamation was complicated and required several iterations and plan revisions before SHPO concurrence was received December 30, 2020.

Archeological Surveys:

- One archaeological survey of approximately 100 acres was completed at the Monument Valley, Arizona, Processing Site in the Navajo Nation. The work was done to support expansion of groundwater monitoring wells north of the processing site location.

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 was submitted to Colorado SHPO in 2020; SHPO concurred with the LM findings.
- 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 was submitted to the Colorado SHPO in 2020; SHPO concurred with the LM findings.

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.

LM did not complete any work in Environmental Justice areas in 2020.

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
Riverton, WY, Processing Site	Gasoline leak from generator on mobile lab trailer.	6/19/2020	1/2 gallon	No	LMS employee placed absorbent pads under the leak. A vent tube was found to be the source; it was placed into a plastic container to capture any further leaks. The absorbent pads and contaminated soil were collected and placed in a bucket for disposal offsite.
Rocky Flats Site	Oil leak from excavator engine failure.	2/5/2020	Approximately 2 gallons	No	The excavator was moved 30 yards away to remove it from the dig area. The operator deployed a spill kit and contained the oil. The contaminated soil was removed and placed into a designated container for disposal offsite. The excavator was removed from the site.
Rocky Flats Site	Hydraulic fluid release from drill rig line failure.	1/22/2020	1/2 gallon	No	The drill rig operator immediately deployed a spill kit and absorbed most of the hydraulic fluid on the ground. The remaining saturated soil was removed and placed in the container for disposal offsite. The hydraulic line was replaced with a new one.

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 environmental notices were received from external agencies or stakeholders, nor were there any self-identified instances of noncompliance.

6.0 Additional Natural Resources Management

In addition to the actions taken under specific regulations, as listed in Section 5.4, LM completed the following activities related to natural resource management:

- LM created a *Natural Resources Management Plan* (LM-Plan-3-20-15.0) and started development of an accompanying training course for all sites where LM manages natural resources.
- 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. BMPs performed in spring 2020 include:
 - Conversion of grasslands to native meadows and prairies.
 - Maintenance of riparian areas for herbaceous plant diversity.
 - Management of roadsides with limited mowing.
 - Minimization of risk of pesticides and fungicides to pollinators.
 - Removal of invasive species.
 - Seeding of native species in restoration, rehabilitation, and revegetation efforts.
- 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. There are no changes in the amount of acreage reported from 2019 to 2020. LM has implemented 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 43 LM sites with a groundwater protection program consisting of monitoring chemical and radiological constituents. The monitoring requirements, number of wells, 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. For this report, active wells are wells that are required to be sampled or monitored for some environmental purpose at some defined frequency as part of a site’s groundwater monitoring network. Point of compliance (POC) wells are a subset of active wells that either (1) are identified in a site regulatory document (i.e., Long-Term Surveillance Plan or Groundwater Compliance Action Plan (GCAP), LTS&M plan, other decision document) or (2) are not specifically defined, but an exceedance at the location triggers some action as agreed upon by LM and the regulator (i.e., requires notification to the regulator of exceedance or requires additional follow up sampling or monitoring for verification). There are 20 LM sites with POC wells.

Wells that are sampled or monitored for parameters other than COCs (e.g., water levels) as required by a site regulatory document are BMP wells. Many sites have wells that are sampled or monitored for some LM-identified purpose but are not required by a site regulatory document; these wells are not reported in the ASER.

Table A-4 summarizes the site-specific groundwater monitoring program for applicable LM sites to include the following:

- Whether the site is sampled for radiological analytes (including uranium isotopes)
- Whether the site is sampled for nonradiological analytes (including elemental uranium)
- The site-specific sampling frequency
- 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, if applicable
- 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 six sites with POC monitoring wells sampled during the reporting period. Exceedances of COCs might not result in violations because violations depend on the regulatory framework for each site.

Many LM sites' regulatory agreements require an annual site-specific environmental report to be issued; each site may use a different title for its report (Annual Monitoring Report, Site Annual Report, Site Environmental Report, etc.). These reports include details on COC exceedances, plume data, contaminant time-concentrations plots from which trending can be evaluated, and other details not discussed in this report. Table A-2 of this report indicates which types of reports a site is required to submit; however, not all reports are issued annually. 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.

LM is pursuing one of its strategic goals of reducing risk at its Monticello, Utah, Site. LM submitted several key documents that evaluate groundwater and surface conditions at the former millsite to demonstrate to EPA and the state of Utah that monitored natural attenuation is still protective of human health and the environment and meets the regulatory criteria for a long-term groundwater strategy. Comment resolution and decisions from these reports are still being negotiated.

7.1 COVID Related Modifications to Sampling and Monitoring Activities

LM made the following modifications to sampling and monitoring activities due to COVID-19 related travel and field work restrictions:

- At the Gunnison, Colorado, Processing Site, LM reached an agreement with NRC to use a risk-based approach for the annual sampling that included the sampling of five domestic wells and six surface water locations. Sampling of the 28 monitoring wells was omitted. There will be no resulting violations for missing the remaining samples.
- At the Pinellas County site, the Florida Department of Environmental Protection concurred that the indoor monitoring wells would not be sampled in September 2020 due to COVID-19 access restrictions in Building 100.

- At the Bluewater, New Mexico, Disposal Site, the 2020 spring semiannual sampling was delayed from May to August 2020 due to COVID-19-related travel restrictions. Due to the delay in the spring semiannual sampling event and a resurgence of COVID-19, the fall 2020 sampling event was cancelled. NRC was notified of the delay and cancellation, and no additional action was required.
- At the Tuba City, Arizona, Disposal Site, the 2020 summer semiannual sampling was cancelled due to COVID-19-related travel restrictions. NRC was notified of the cancellation, and no additional action was required.
- At the Shiprock disposal site, the 2020 spring and fall semiannual sampling events were cancelled due to COVID-19-related travel restrictions. NRC was notified of the cancellation, and no additional action was required.
- At the Monument Valley processing site, the 2020 annual sampling was cancelled due to COVID-19-related travel restrictions. NRC was notified of the cancellation, and no additional action was required.

7.2 PFAS and Emerging Contaminants

LM did not perform any sampling for PFAS or emerging contaminants in 2020.

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://www.energy.gov/lm/articles/annual-site-inspection-and-monitoring-report-umtrca-title-ii-disposal-sites>), 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 and the LMS contractor held two routine semiannual ALARA meetings in 2020 to allow personnel to be involved in the ALARA process, including identification of potential environmental and public impacts.
- No site-specific ALARA reviews were completed.

8.1 Unplanned Radiological Releases

There were no unplanned radiological releases in 2020.

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, offices, or facilities in 2020 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 in this section. 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.

No prescribed burns occurred at LM sites in 2020.

LM sites with wildland fire management plans include:

- Fernald Preserve
- Grand Junction disposal site
- Monticello disposal and processing sites
- Rocky Flats Site
- Tuba City disposal site
- Weldon Spring Site

Although unoccupied sites generally do not have wildland fire management plans due to work being 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. During “fire season,” April through October, a weekly fire watch summary report is distributed to site leads and site managers and other interested internal parties. The summary reports any wildfire that occurred within 20 miles of an LM site (excluding DRUM sites) and notes the fire size, fire discovery date and cause, and percent contained if available. Safety and Health monitors the areas affected by wildfire smoke to reduce health risks for employees performing field work. If wildfire smoke decreases visibility to less than 5 miles in the working area or if workers have respiratory complications due to smoke inhalation, a pause work is initiated, and employees are instructed to evacuate the area and contact the lead safety supervisor or technical manager for direction.

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 international standard. Implementing documents include the *LM Quality Assurance Policy* (LM 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 Issue 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 2020.

Table 3. Contracted Analytical Laboratories and TSDFs

Laboratory	Location
GEL Laboratories LLC	2040 Savage Road Charleston, SC 29407
Eurofins TestAmerica	13715 Rider Trail North Earth City, MO 63045
	880 Riverside Parkway West Sacramento, CA 95605
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
Eurofins TestAmerica	4995 Yarrow Street Arvada, CO 80002
TSDF	Location
EnergySolutions Inc. Clive Disposal Facility	Interstate 80 Exit 49 Grantsville, UT 84029

Appendix A

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

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

CERCLA/RCRA Sites
Maxeys 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 This group represents 166 individual projects but is counted as a single site or entry in the LM *Site Management Guide*.

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											
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
Tonopah Test Range, NV, Site https://www.energy.gov/lm/tonopah-test-range-nevada-site	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
Bluewater, NM, Disposal Site https://www.energy.gov/lm/bluewater-new-mexico-disposal-site	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
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
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											
Bronco, CO, Site https://www.energy.gov/lm/plowsharevela-uniform-program-sites					x						
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 LM compliance with EPCRA. Refer to Section 5.1 for details.

^b Environmental monitoring reports may include the following (some of which provide trending of data such as contaminant time-concentration plots):

- | | |
|---|---|
| <ul style="list-style-type: none"> • Verification monitoring reports • Groundwater monitoring reports | <ul style="list-style-type: none"> • 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:

- | | |
|---|--|
| <ul style="list-style-type: none"> • Historical air monitoring locations • Analytical chemistry data • Groundwater depths and elevations • Well logs and well construction data | <ul style="list-style-type: none"> • 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>.

^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.

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 https://www.energy.gov/lm/fernal-d-preserve-ohio-site	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	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 UMRCA 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-jection-colorado-disposal-and-processing-sites	x	x				x					x	x
Grand Junction, CO, Disposal Site https://www.energy.gov/lm/grand-jection-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	x

Notes:

^a LM conducts chemical inventories at certain sites to ensure compliance with EPCRA. Refer to section 5.1 for details.

^b Types of environmental monitoring reports include:

- | | |
|---|---|
| <ul style="list-style-type: none"> • Verification monitoring reports • Groundwater monitoring reports | <ul style="list-style-type: none"> • Hydrologic and natural gas sampling and analysis reports • Federal Facility Agreement quarterly reports • Site environmental reports (including CERCLA site annual 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:

- | | |
|--|--|
| <ul style="list-style-type: none"> • Analytical groundwater and surface water data • Groundwater depths and elevations • Well logs and well construction data | <ul style="list-style-type: none"> • Georeferenced boundaries • Site physical features • Water quality sampling locations |
|--|--|

Table A-4. Calendar Year 2020 Groundwater Monitoring Program and COC Exceedance Summary

Site Name	Rad Monitoring ^a	Nonrad Monitoring ^b	Sampling Frequency	COCs ^c	Active Wells	POC Wells ^d	Exceedance during reporting period at POC Wells
CERCLA/RCRA Sites							
Fernald Preserve, OH, Site	X	X	Semi-annually *	Alpha-chlordane, antimony, aroclor-1254, arsenic, barium, beryllium, benzene, bis(2-chloroisopropyl) ether, bis(2-ethylhexyl) phthalate, boron, bromodichloromethane, bromoform, bromomethane, cadmium, carbazole, carbon disulfide, chloroethane, chloroform, chromium (VI), cobalt, copper, fluoride, lead, manganese, mercury, methylene chloride, molybdenum, neptunium-237, nickel, nitrate + nitrite, octachlorodibenzo- <i>p</i> -dioxin-, radium-226, radium-228, selenium, silver, strontium-90, technetium-99, thorium-228, thorium-230, thorium-232, trichloroethene, total uranium, vanadium, vinyl chloride, zinc, 1,1-dichloroethane, 1,1-dichloroethene, 1,2-dichloroethane, 4-methylphenol, 4-nitrophenol, and 2,3,7,8-tetrachlorodibenzo- <i>p</i> -dioxin	93	0	N/A
Laboratory for Energy-Related Health Research, CA, Site	X	X	Quarterly*	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

Table A-4. Calendar Year 2020 Groundwater Monitoring Program and COC Exceedance Summary (continued)

Site Name	Rad Monitoring ^a	Nonrad Monitoring ^b	Sampling Frequency	COCs ^c	Active Wells	POC Wells ^d	Exceedance during reporting period at POC Wells
Monticello, UT, Disposal and Processing Sites	X	X	Semi-annually*	Arsenic, gross alpha activity, gross beta, isotopic uranium, manganese, molybdenum, nitrate, selenium, uranium, vanadium	157	0	N/A
Mound, OH, Site	X	X	Semi-annually*	Tetrachloroethene, trichloroethene, tritium, vinyl chloride, <i>cis</i> -1,2-dichloroethene, <i>trans</i> -1,2-dichloroethene	54	0	N/A
Pinellas County, FL, Site		X	Semi-annually**	Trichloroethene, vinyl chloride, 1,1-dichloroethene, 1,4-dioxane, <i>cis</i> -1,2-dichloroethene, <i>trans</i> -1,2-dichloroethene	121	0	N/A
Rocky Flats Site, CO	X	X	Quarterly*	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	Quarterly*	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 2020 Groundwater Monitoring Program and COC Exceedance Summary (continued)

Site Name	Rad Monitoring ^a	Nonrad Monitoring ^b	Sampling Frequency	COCs ^c	Active Wells	POC Wells ^d	Exceedance during reporting period at POC Wells
Nevada Offsites							
Central Nevada Test Area, NV	X		3 years*	Carbon-14, iodine-129, tritium	12	11	No
Gasbuggy, NM, Site	X		5 years	Tritium	3	0	N/A
Gnome-Coach, NM, Site	X		Annually*	Cesium-137, strontium-90, tritium	3	0	N/A
Rio Blanco, CO, Site	X		Annually*	tritium	4	0	N/A
Rulison, CO, Site	X		Annually*	tritium	3	0	N/A
Salmon, MS, Site	X	X	2 years	<i>Cis</i> 1,2 -dichloroethene-, <i>trans</i> -1,2-dichloroethene, trichloroethene, tritium, vinyl chloride	32	0	N/A
Shoal, NV, Site	X		3 years	Carbon-14, iodine-129, tritium,	13	13	N/S
UMTRCA Sites							
Ambrosia Lake, NM, Disposal Site		X	3 years	Molybdenum, nitrate + nitrite as nitrogen, selenium, sulfate, uranium	3	0	N/A
Bluewater, NM, Disposal Site		X	Semi-annually**	Molybdenum, selenium, uranium	20	4	No
Burrell, PA, Disposal Site		X	5 years*	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	5 years	Uranium	5	3	N/S
Durango, CO, Disposal Site		X	Annually*	Molybdenum, selenium, uranium	9	3	No
Durango, CO, Processing Site		X	Annually*	<u>Cadmium</u> , <u>manganese</u> , molybdenum, <u>selenium</u> , <u>sulfate</u> , <u>uranium</u>	13	8	Yes ^f
Falls City, TX, Disposal Site		X	Annually*	Uranium	12	0	N/A

Table A-4. Calendar Year 2020 Groundwater Monitoring Program and COC Exceedance Summary (continued)

Site Name	Rad Monitoring ^a	Nonrad Monitoring ^b	Sampling Frequency	COCs ^c	Active Wells	POC Wells ^d	Exceedance during reporting period at POC Wells
Grand Junction, CO, Disposal Site		X	Annually*	Molybdenum, nitrate as nitrogen, polychlorinated biphenyls, selenium, sulfate, total dissolved solids, uranium, vanadium	3	0	N/A
Grand Junction, CO, Processing Site		X	5 years	Ammonia (as NH ₄), molybdenum, uranium	4	0	N/A
Green River, UT, Disposal Site		X	Annually*	Nitrate, sulfate, uranium	22	4	Yes ^g
Gunnison, CO, Disposal Site		X	5 years [#]	Calcium, chloride, iron, magnesium, manganese, potassium, sodium, sulfate, total dissolved solids, uranium	16	8	N/S
Gunnison, CO, Processing Site		X	Annually*	Manganese, uranium	34	26	No
Lakeview, OR, Disposal Site		X	5 years	Arsenic, cadmium, uranium	9	8	N/S
L-Bar, NM, Disposal Site		X	3 years	Chloride, nitrate + nitrite as nitrogen, selenium, sulfate, total dissolved solids, uranium	10	4	N/S
Monument Valley, AZ, Processing Site		X	Annually ⁺	Nitrate, sulfate, uranium	73	0	N/A
Naturita, CO, Processing Site		X	Semi-annually*	Arsenic, uranium, vanadium	8	4	No
Rifle, CO Processing (New) Site		X	Semi-annually*	Arsenic, molybdenum, nitrate as nitrogen, selenium, uranium, vanadium	17	8	No
Rifle, CO Processing (Old) Site		X	Semi-annually*	Selenium, uranium, vanadium	8	0	N/A
Riverton, WY, Processing Site		X	Annually*	Manganese, molybdenum, sulfate, uranium	64	54	Yes ^h
Sherwood, WA, Disposal Site		X	Annually*	Chloride, sulfate, total dissolved solids	3	0	N/A
Shiprock, NM, Disposal Site		X	Semi-annually ⁺	Ammonium, manganese, nitrate, selenium, strontium, sulfate, uranium	133	0	N/A

Table A-4. Calendar Year 2020 Groundwater Monitoring Program and COC Exceedance Summary (continued)

Site Name	Rad Monitoring ^a	Nonrad Monitoring ^b	Sampling Frequency	COCs ^c	Active Wells	POC Wells ^d	Exceedance during reporting period at POC Wells
Shirley Basin South, WY, Disposal Site	X	X	Annually*	Cadmium, chloride, chromium, lead, nickel, nitrate, <u>radium-226</u> , <u>radium-228</u> , <u>selenium</u> , sulfate, thorium-230, total dissolved solids, uranium	14	4	Yes ⁱ
Slick Rock, CO, Processing Site	X	X	Annually*	BETX (benzene, ethylbenzene, toluene and xylenes), manganese, <u>molybdenum</u> , <u>nitrate</u> , radium-226, radium-228, <u>selenium</u> , <u>uranium</u>	18	11	Yes ^f
Tuba City, AZ, Disposal Site		X	Semi-annually [#]	<u>Molybdenum</u> , <u>nitrate</u> , <u>selenium</u> , <u>uranium</u>	149	7	Yes ^j
FUSRAP Sites							
Colonie, NY, Site		X	Biennially	<i>Cis</i> -1,2-dichloroethene, tetrachloroethene, <u>trichloroethene</u> , vinyl chloride	7	7	N/A ^k
D&D Sites							
Grand Junction, CO, Site		X	Annually*	Manganese, molybdenum, selenium, sulfate, uranium	7	7	Yes
Hallam, NE, Decommissioned Reactor Site	X	X	5 years	Gamma-emitting nuclides, gross alpha, gross beta, nickel-63, tritium, uranium	19	0	N/A
Site A/Plot M, IL, Decommissioned Reactor Site	X		Quarterly*	Strontium-90, tritium	19	0	N/A

Table A-4. Calendar Year 2020 Groundwater Monitoring Program and COC Exceedance Summary (continued)

Site Name	Rad Monitoring ^a	Nonrad Monitoring ^b	Sampling Frequency	COCs ^c	Active Wells	POC Wells ^d	Exceedance during reporting period at POC Wells
Nuclear Waste Policy Act Section 151 Site							
Parkersburg, WV, Disposal Site	X	X	10 years	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	2	0	N/A

Notes:

- * Sites with sampling frequency marked with * were sampled during the reporting period.
- + Site was not sampled in calendar year 2020 due to covid-19 restrictions.
- # Normal sampling routine was impacted due to covid-19 restrictions.
- ^a 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 and/or which an exceedance will trigger a regulatory action.
- ^e Exceedance during reporting period:
 - No: the site was sampled but had no exceedances of COCs
 - Yes: there was an exceedance of one or more COCs
 - Not Sampled (N/S): the site was not required to be sampled during the reporting period
 - Not Applicable (N/A): there are no regulatory actions if an exceedance occurs or there are no defined POC wells

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.

- ^f See Table A-5 for exceedances at UMTRCA processing sites and D&D sites.
- ^g Green River site: *2020 Annual Site Inspection and Monitoring Report for Uranium Mill Tailings Radiation Control Act Title I Disposal Sites* (March 2021).
- ^h Riverton Processing site: Annual site document is not yet available, details on 2020 sampling can be located on the LM GEMS site <https://gems.lm.doe.gov/#site=RVT>
- ⁱ Shirley Basin South site: *2020 Annual Site Inspection and Monitoring Report for Uranium Mill Tailings Radiation Control Act Title II Disposal Sites* (December 2020).
- ^j Tuba City site: *2020 Annual Site Inspection and Monitoring Report for Uranium Mill Tailings Radiation Control Act Title I Disposal Sites* (March 2021).
- ^k The Colonie site transitioned to LM in 2019. In 2020, LM issued the *Long-Term Groundwater Monitoring Report. Colonie, New York, Site-Natural Attenuation Remedy*, details on exceedances and the ongoing remedy can be found there.

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	Geospatial Environmental Mapping System (doe.gov)
	Manganese	4.0	1.7	
	Molybdenum	0.068	0.1	
	Selenium	0.059	0.05	
	Sulfate	2900	1500	
	Uranium	1.3	0.044	
Grand Junction, CO, Site (D&D Site)	Uranium	0.46	0.044	https://gems.lm.doe.gov/#site=GJO
Slick Rock, CO, Processing Sites	Manganese	4.0	3.5	https://gems.lm.doe.gov/#site=SRW and https://gems.lm.doe.gov/#site=SRE
	Molybdenum	1.9	0.1	
	Nitrate	170	44	
	Selenium	2.8	0.01	
	Uranium	0.078	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 site: [Ground Water Compliance Action Plan for the Durango, Colorado, UMTRCA Project Site \(February 2008\)](#).
- Grand Junction site: [Long-Term Surveillance and Maintenance Plan for the Grand Junction, Colorado, Site \(June 2006\)](#).
- 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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