Department of Energy
Washington, DC 20585

September 28, 2017

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

FROM: **TANIA SMITH TAYLOR** Tania A. Taylor
DIRECTOR, OFFICE OF SITE OPERATIONS
OFFICE OF LEGACY MANAGEMENT

SUBJECT: Annual Site Environmental Reporting for Department of Energy Office of Legacy Management Sites (2016)

The U.S. Department of Energy Office of Legacy Management (LM) is submitting the attached *Office of Legacy Management 's Summary of Annual Site Environmental Reports* for calendar year 2016 to meet the intent of DOE Order 231.1B with a scaled-down approach as identified in the Annual Site Environmental Report (ASER) preparation guidance. LM is committed to ensuring environmental protection, compliailce, and sustainability in the performance of our mission, vision, and operating principles.

Please review the summary and attachments and contact Tracy Ribeiro at (303) 410-4817 if you have any comments or questions.

Attachment

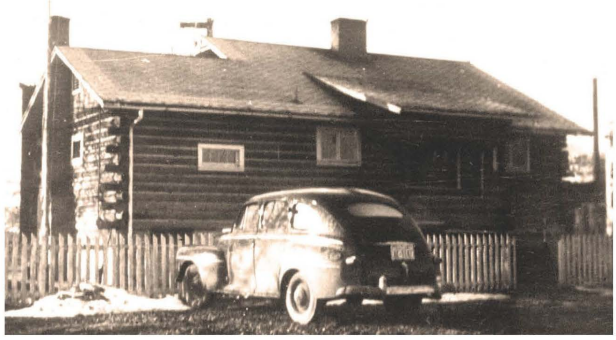
cc w/ attachment:
R. Natoli, DOE-AU-20 (e)
C. Melendez, DOE-LM (e)
T. Pauling, DOE-LM (e)
T. Ribeiro, DOE-LM (e)
D. Shafer, DOE-LM (e)
B. Sokolovich, DOE-LM (e)
B. Cook, Navarro (e)
S. Osborn, Navarro (e)
T. Rotert, Navarro (e)
File: ADM 0115.02 (records)

U.S. DEPARTMENT OF ENERGY | Legacy Management

Summary of Annual Site Environmental Reports

Calendar Year 2016

LMS/S14598



Cover photo captions:

Top left: The Department of Energy's Office of Legacy Management received the 2016 Keeping It Clean Award, one of 12 GreenGov Presidential Awards, for the innovative development of a groundwater treatment system that runs on batteries and recharges with solar power at the Rocky Flats Site, Colorado.

Bottom left: The top photo shows the log cabin at the Grand Junction, Colorado, Site when the site was operated by the Manhattan Engineer District during World War II (1943–1945) and the cabin was the facility's administrative center. The bottom photo shows what the rehabilitated cabin looks like in 2017, when it was listed on the National Register of Historic Places.

Bottom right: The Gunnison sage-grouse is listed as a threatened species with designated critical habitat under the Endangered Species Act. Site activities are evaluated to determine if proposed actions would have any impact on listed species, such as the Gunnison sage-grouse, or their habitat.

Contents

Attachment

This page intentionally left blank

Abbreviations

AEA	Atomic Energy Act
AEC	U.S. Atomic Energy Commission
ARAR	applicable or relevant and appropriate requirement
ASER	Annual Site Environmental Report
BLM	Bureau of Land Management
CAA	Clean Air Act
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	*Code of Federal Regulations*
COC	contaminant of concern
CWA	Clean Water Act
D&D	Decontamination and Decommissioning
DOE	U.S. Department of Energy
DRUM	Defense-Related Uranium Mines
EISA	Energy Independence and Security Act
EMS	Environmental Management System
EO	Executive Order
EPA	U.S. Environmental Protection Agency
EPCRA	Emergency Planning and Community Right to Know Act
EPEAT	Electronic Product Environmental Assessment Tool
ESA	Endangered Species Act
ESL	Environmental Sciences Laboratory
FFCA	Federal Facilities Compliance Act
FIFRA	Federal Insecticide, Fungicide, and Rodenticide Act
FIMS	Facility Information Management System
FUSRAP	Formerly Utilized Sites Remedial Action Program
HSWA	Hazardous and Solid Waste Amendments
ISO	International Organization for Standardization
LLW	low-level radioactive waste
LM	Office of Legacy Management
LMS	Legacy Management Support
LTS&M	long-term surveillance and maintenance
MBTA	Migratory Bird Treaty Act

MSPTS	Mound Site Plume Treatment System
NEPA	National Environmental Policy Act
NESHAP	National Emission Standards for Hazardous Air Pollutants
NHPA	National Historic Preservation Act
NPDES	National Pollutant Discharge Elimination System
NR	National Register of Historic Places
NRC	U.S. Nuclear Regulatory Commission
NWPA	Nuclear Waste Policy Act
POC	point of compliance
RCRA	Resource Conservation and Recovery Act
RFS	Rocky Flats Site, Colorado
RPP	Radiation Protection Program
RTC	Riverview Technology Corporation
SARA	Superfund Amendments and Reauthorization Act
SDWA	Safe Drinking Water Act
SHPO	State Historic Preservation Officer
SPPTS	Solar Ponds Plume Treatment System
SSP	Site Sustainability Plan
TSCA	Toxic Substances Control Act
ULP	Uranium Leasing Program
UMTRCA	Uranium Mill Tailings Radiation Control Act
USACE	U.S. Army Corps of Engineers
USFS	U.S. Forest Service
USFWS	U.S. Fish and Wildlife Service

1.0 Reporting Requirement

U.S. Department of Energy (DOE) Order 231.1B Admin. Chg 1, *Environment, Safety and Health Reporting*, requires that each DOE site prepare an Annual Site Environmental Report (ASER) documenting the site's environmental conditions and compliance with DOE reporting requirements. The ASER is submitted to DOE headquarters annually and is available to the public. DOE's *Guidance for the Preparation of the 2016 Department of Energy Annual Site Environmental Reports* (March 2017) recognizes that Office of Legacy Management (LM) sites have unique characteristics and suggests two alternatives to the preparation of the ASER: (1) prepare a scaled-down or streamlined version of the ASER that reflects the current nature and extent of site operations and monitoring programs, or (2) submit equivalent documentation that provides the results of the relevant environmental monitoring programs. This scaled-down report (alternative 1) meets the intent of DOE Order 231.1B Admin. Chg 1 and provides a summary of LM's programmatic and site-specific environmental activities, including reporting, for calendar year 2016.

2.0 Introduction

LM was established in 2003 to manage DOE's postclosure responsibilities at sites under its care and ensure the future protection of human health and the environment at those sites. The histories of the legacy sites vary, as do the regulatory regimes under which the sites are managed. Long-term surveillance and maintenance (LTS&M) plans or equivalent documents are prepared for the sites. These documents, which are available to the public, include site descriptions and information about site history, the nature and extent of contamination, closeout condition of the site, present and future monitoring and surveillance programs, and institutional controls. Examples of the types of sites and their regulatory framework are provided below and in the following link: https://energy.gov/lm/sites/lm-sites/programmatic-framework.

- During the reporting period, LM managed eight sites where remediation was conducted in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) or Resource Conservation and Recovery Act (RCRA), or both. These sites were radiologically or chemically contaminated by federal milling, processing, research, or weapons-manufacturing operations.
- The Nevada Offsites program includes sites where underground nuclear tests and experiments were performed outside of the Nevada National Security Site (formerly the Nevada Test Site). Underground nuclear testing was conducted for various purposes, including stimulating natural gas production and cataloging seismic detonation signatures. LM managed nine Nevada Offsites during the reporting period. The two sites in Nevada are managed under the regulatory authority of a Nevada-administered Federal Facility Agreement Consent Order, and the remaining seven sites are managed in collaboration with the host-state agencies.
- The Uranium Mill Tailings Radiation Control Act (UMTRCA) (Title 42 *United States Code* Section 7901, as amended [42 USC 7901]) addresses the remediation and regulation of uranium mill tailings at uranium mill sites addressed under Titles I and II of UMTRCA.
    - Title I sites are former uranium mill sites that were unlicensed and essentially abandoned when UMTRCA was implemented on January 1, 1978. Title I of UMTRCA identified

inactive uranium ore–processing sites that required remediation. LM managed 21 UMTRCA Title I sites during the reporting period that contain encapsulated uranium mill tailings and associated contaminated material.

  - Title II of UMTRCA addresses remediation and reclamation of uranium mill sites that were under specific license on or after January 1, 1978. LM managed six remediated UMTRCA Title II sites during the reporting period. The number will increase as ongoing site reclamations are completed and the sites are transferred from the licensee to LM for LTS&M.

- The U.S. Atomic Energy Commission (AEC), predecessor to DOE, established the Formerly Utilized Sites Remedial Action Program (FUSRAP) in 1974 to remediate sites where radioactive contamination remained from the Manhattan Engineer District ("Manhattan Project") and early AEC operations. DOE assessed more than 600 candidate facilities and determined that 46 would be eligible for remediation under FUSRAP. DOE remediated 25 sites from 1974 to 1997, when Congress directed the U.S. Army Corps of Engineers (USACE) to assume responsibility for the remediation work of the remaining 21 designated FUSRAP sites. USACE retains responsibility for the site for 2 years after remediation and then transfers the long-term stewardship responsibilities of the site to LM. Long-term stewardship may include surveillance and maintenance of remediated sites or be limited to management of site records and responding to stakeholder inquiries. LM managed 31 FUSRAP sites during the reporting period. The number will increase as ongoing site reclamations are completed and the sites are transferred to LM for LTS&M.
- DOE established the Defense Decontamination and Decommissioning (D&D) Program for the remediation of surplus DOE facilities. D&D sites have been transferred to LM for LTS&M. LM managed five D&D sites during the reporting period. Four of these sites are former nuclear power plants, and the fifth was a uranium ore pilot processing and shipping center.
- Certain sites with low-level radioactive contamination remediated by the owner under the U.S. Nuclear Regulatory Commission (NRC) Site Decommissioning Management Program can be transferred to the federal government under Section 151 of the Nuclear Waste Policy Act (NWPA). LM managed one NWPA Section 151 site for LTS&M during the reporting period.
- Other LM activities include:
  - Managing records and stakeholder support of 10 additional remediated sites.
  - Maintenance of five calibration facilities for environmental radiation sensors.
  - Managing the Uranium Leasing Program (ULP), including administrative, oversight, and inspection activities for 31 uranium mining lease tracts in southwestern Colorado.
  - Managing the Defense-Related Uranium Mines (DRUM) Program, which was established by LM in 2016 as a result of the Defense Authorization Act of 2013 to further assess the condition of abandoned uranium mine sites and determine potential physical safety hazards, accessibility, and risks to human health and the environment.
  - Supporting the operation of the Environmental Sciences Laboratory (ESL). This operation performs applied research and demonstrations of soil and groundwater remediation and treatment technologies.

3.0 Summary of General Environmental Reporting

3.1 Oversight

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

3.2 Summary of Site-Specific Activities

In 2016, LM managed the long-term care of 91 sites. The sites and their respective categories are listed in the LM *Site Management Guide*, which is updated annually and available at https://energy.gov/lm/downloads/site-management-guide. Each geographic site location is counted as one site in the guide, including locations that have a former processing site and disposal site.

LM classifies the sites as either Category 1, Category 2, or Category 3 based on the actual or anticipated LTS&M activities associated with that site. In general, the lower the category number, the fewer activities and less environmental monitoring occur at the site, resulting in less documentation and reporting. However, a site's category can change depending on changes in site conditions (e.g., changes in groundwater remediation strategies or regulatory changes). The three categories of LM sites and their 2016 site counts according to the *Site Management Guide* are as follows (sites grouped as one in the *Site Management Guide* are addressed individually in Tables 1 through 4 of Attachment 1):

1. Category 1 sites
    - Category 1 sites are listed in Table 1 of Attachment 1 and include 35 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 2 of Attachment 1 and include 46 LM sites.
    - LM activities include:
        - Conducting required inspections (typically annually) and maintenance
        - Sampling for environmental monitoring data, as required
        - Managing site records and supporting stakeholder inquiries and requests for information (historical site information and monitoring results, if LTS&M is required, 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 3 of Attachment 1 and include 10 LM sites.
    - LM activities include:
        - Operating and maintaining remedial action systems (e.g., active treatment systems for contaminated groundwater or surface water)
        - Conducting required inspections (typically annually) and maintenance
        - Sampling for environmental monitoring data, as required
        - Implementing and managing administrative and institutional controls
        - Managing site records and supporting stakeholder inquiries, requests for information, and routine communications (historical site information and monitoring results are accessible online for stakeholders)
        - Preparing inspection, monitoring, and compliance reports, as required

Tables 1 through 4 of Attachment 1 summarize the monitoring and associated reporting for each site. The majority of the information identified in the tables is available on site-specific websites that can be accessed from the main LM website (https://energy.gov/lm/office-legacy-management) or from the site-specific links provided in Attachment 1 of this report. Any additional information is available upon request. When annual inspection and monitoring reports are issued, LM sends copies or notices of electronic availability to site stakeholders, including site and federal regulators and local governments. LM is providing Attachment 1 as a summarized version of the environmental reporting in lieu of individual reports.

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

1. Calibration facilities
    - Calibration facilities consist of five facilities that are used for the calibration of radiometric instrumentation for measurements of radium (uranium), thorium, and potassium. Access to facilities is granted to non-LM users upon request.
    - The primary calibration facilities are located in Grand Junction, Colorado, and secondary facilities are located at each of the three sites: Grants, New Mexico; George West, Texas; and Casper, Wyoming.
    - LM activities include facility maintenance, annual inspections, and records-related activities.
2. ULP
    - The ULP consists of 31 uranium mining lease tracts within southwestern Colorado.
    - LM activities include:
        - Annual inspections of mining operations by LM to assure that leaseholders adhere to lease stipulations
        - Oversight of leaseholder routine maintenance activities
        - Preparation of an annual status and activities report that summarizes LM activities for the ULP in that calendar year

- Due to a court-ordered injunction, leaseholders did not perform any exploration, development, mining or extraction, or reclamation activities on the DOE lease tracts during the reporting period.

3. DRUM Program
   - The DRUM Program consists of more than 4000 abandoned uranium mines, 90% of which are in five states (Arizona, Colorado, New Mexico, Utah, and Wyoming).
   - LM activities include
     - — Verification and validation of the condition of DRUM sites on lands managed by the U.S. Bureau of Land Management (BLM) and U.S. Forest Service (USFS).
     - — Preparation of a report written for each mine. Reports will be transmitted to the appropriate agency: BLM or USFS.

4. ESL
   - The ESL is located at the Grand Junction, Colorado, Site and was established to support LM programs.
   - The ESL consists of a geochemical laboratory, an ecology laboratory, and a petrography facility. Applied research and laboratory-scale demonstrations of soil and groundwater remediation and treatment technologies are performed at the ESL.
   - LM activities at the ESL include:
     - — Performing laboratory analyses.
     - — Maintaining and calibrating laboratory equipment and maintaining service contracts.
     - — Conducting required safety and health inspections, including inspections that are performed to ensure proper housekeeping is conducted to limit the potential for cross-contamination.
     - — Maintaining a chemical inventory, including a separation segregation system, Safety Data Sheets, and certificates of analysis.
     - — Documenting ESL activities in the annual Applied Studies & Technology Annual Report.

4.0 Summary of Environmental Management System and Sustainability

As required by prior DOE orders and DOE Order 436.1, *Departmental Sustainability*, LM has had a fully implemented Environmental Management System (EMS) since October 2005. LM has declared full implementation of the EMS every 3 years starting in 2009, with the latest declaration on June 30, 2015. LM's EMS is a comprehensive system to incorporate life-cycle environmental considerations into all aspects of the LM mission to maximize beneficial resources, minimize wastes and adverse environmental impacts, and meet or exceed compliance with applicable regulations and DOE requirements. The EMS serves as the platform for adhering to, implementing, and tracking environmental requirements for compliance and sustainability.

The LM EMS is consistent with the framework of the International Organization for Standardization (ISO) Standard 14001, *Environmental Management System*; the Integrated Safety Management System requirements of DOE Policy 450.4A, *Integrated Safety Management Policy*; and Title 10 *Code of Federal Regulations* Section 851 (10 CFR 851), *Worker Safety and Health Program*. LM conducted an independent assessment of the LM EMS in early 2016 in accordance with ISO Standard 14001 and LM's *Environmental Management System Description*.

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

- LM's *Environmental Policy* (LM PO 436.1C, currently posted policy)
- LM's *Environmental Management System Description* (LMS/POL/S04346)

4.1 Performance Measures

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

- LM Site Sustainability Plan (SSP): LM reports past performance and future plans for meeting sustainability goals in the SSP. This assists DOE with meeting its sustainability goals, objectives, and targets established in Executive Order (EO) 13693 (which superseded EOs 13423 and 13514 on March 19, 2015); DOE Order 436.1, *Departmental Sustainability*; and the DOE Strategic Sustainability Performance Plan.
- Annual Energy Report: This 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.
- Energy Independence and Security Act (EISA) Section 432 Report: EISA reinforces the energy reduction goals for federal agencies put forth in EO 13693. Section 432 requires federal agencies to identify facilities that constitute at least 75% of the agency's facility energy use. Comprehensive energy and water evaluations of 25% of facilities are completed each year, and an evaluation of each facility is completed once every 4 years. Section 432 reports are submitted annually to provide a status on energy and water evaluations, benchmarking, and project implementation and measures follow-up.
- LM EMS Annual Facility Data Report: This report contains information about the status of the LM EMS.
- Facility Information Management System (FIMS) updates: FIMS collects information about real property attributes and use, including compiling a list of assets excluded from the energy intensity reduction goal. The database also stores data on buildings that have been

assessed or are scheduled to be assessed against the High Performance Sustainable Building goals.

- Federal Acquisition Statistical Tool updates: This tool collects data about current and past federal fleet fuel use, vehicle inventory, and vehicle acquisitions for the current year in addition to plans that project 2 years into the future.
- LM Significant Environmental Aspects: This document describes the four categories of significant environmental impacts that could result from LM site activities. The environmental aspect of an activity is the portion that creates a possibility for a significant environmental impact if not controlled.

4.2 Accomplishments, Awards, and Recognition

LM received the following awards in 2016 for EMS-related activities:

- An Electronic Product Environmental Assessment Tool (EPEAT) Purchasers Award for purchasing EPEAT-rated electronic equipment.
- A DOE Sustainability Project Award in the Waste Reduction and Pollution Prevention category for designing and building a solar-powered groundwater treatment system at the Rocky Flats Site, Colorado (RFS) (see "Rocky Flats Sustainability Innovations Improve Groundwater Treatment While Reducing Waste and Pollution" at https://energy.gov/sites/prod/files/2016/07/f33/2016_DOESustainabilityAwards.pdf).
- A 2016 Keeping It Clean Award, one of 12 GreenGov Presidential Awards, for the RFS groundwater treatment system.

LM continues to work toward sustainability goals. The table below shows LM's overall ranking in DOE sustainability goal performance for 2016 compared with the other DOE program secretarial offices (based on DOE's annual Greenhouse Gas Inventory).

Scope 1&2 Greenhouse Gas Progress	Scope 3 Greenhouse Gas Progress	Energy Use Intensity Progress	Water Use Intensity Progress	Renewable Energy	High Performance Sustainable Buildings	Power Management
6th out of 11	5th out of 11	9th out of 11	1st out of 11	3rd out of 11	1st out of 11	Tied for 1st with 7 other offices

5.0 Summary of Environmental Compliance

The following subsections summarize compliance with applicable regulations and the related reporting that occurred in 2016. Because LM sites are managed under different regulatory frameworks, postclosure environmental requirements vary based on the activities being conducted and other factors.

5.1 Environmental Restoration and Waste Management Compliance

CERCLA: CERCLA was enacted by Congress in 1980 to enforce cleanup and reporting requirements on closed and abandoned hazardous waste–contaminated property. Typically, the lead agency at the federal facility (DOE) initiates a response action under CERCLA if there is a

release or a substantial threat of a release of a hazardous substance into the environment. Remedial actions have been completed at LM sites that are regulated by the U.S. Environmental Protection Agency (EPA) with the exception 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 Attachment 1 of this report. A Five-Year Review report is required for a CERCLA site that has residual contamination left in place (see Table 2 and Table 3) to evaluate whether the remedy at the site remains protective of human health and the environment.

LM completed Five-Year Review reports for the following sites this year, and EPA concurred with the protectiveness statement for each in September 2016:

- Laboratory for Energy-Related Health Research, California, Site
- Mound, Ohio, Site
- Weldon Spring, Missouri, Site
- Fernald Preserve, Ohio, Site

LM initiated Five-Year reports for the following sites this year:

- RFS in October 2016
- Monticello, Utah, Disposal and Processing Sites in August 2016

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

- In 2016, each site that generated hazardous waste maintained the status of a Conditionally Exempt Small Quantity Generator (a term to be replaced with Very Small Quantity Generator as states adopt the new definition).
- Hazardous waste was shipped from the Grand Junction, Colorado, Site to a local county hazardous waste collection facility for Very Small Quantity Generators for offsite disposal.
- An active RCRA HSWA corrective action permit issued by the State of Florida is maintained for the Pinellas County, Florida, Site. The permit includes requirements for remedial action at the site under state Global Risk-Based Corrective Action regulations. Pinellas maintains compliance with this permit, which was renewed as a 10-year permit in January 2012.

Federal Facilities Compliance Act (FFCA): FFCA was enacted in 1992 and amended RCRA with the objectives of bringing all federal facilities into compliance with applicable federal and state hazardous waste laws, of waiving federal sovereign immunity under those laws, and of allowing the imposition of fines and penalties. The FFCA gave EPA the authority to issue administrative compliance orders to federal agencies that violate 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 RCRA.

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

- In 2016, EPCRA reports were submitted for RFS and the Tuba City, Arizona, Disposal Site, both of which stored chemicals in quantities that exceeded EPCRA threshold planning quantities.

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

- An assessment to determine the presence and extent of asbestos-containing material and lead-based paint at the Piqua, Ohio, Decommissioned Reactor Site was completed in October 2016. LM is currently evaluating abatement options for the presence of these materials in the decommissioned Reactor Building.
- No other TSCA-regulated actions occurred at other LM sites during this reporting period.

Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA): FIFRA regulates the distribution, use, and sale of pesticides and requires that a certified applicator must supervise the application of herbicides or pesticides on property other than the applicator's own.

- LM uses herbicides and pesticides at many LM sites as part of land stewardship responsibilities. Policies, procedures, and manuals are in place to ensure that they are used in compliance with FIFRA and under the control and instruction of a certified applicator.

Radioactive Waste Management: The type of radioactive waste generated at an LM site is dependent on the source and characteristics of the radioactivity and the regulatory driver(s) associated with radioactive material at the site. For example, radioactive waste generated at an UMTRCA site is characterized as residual radioactive material (UMTRCA Title I site) or Atomic Energy Act (AEA) Section 11e.(2) byproduct material (UMTRCA Title II site), whereas radioactive waste generated at a CERCLA or RCRA site is typically characterized as low-level radioactive waste (LLW). Management and disposal requirements differ for these specific waste types. Radioactive wastes are managed in accordance with the AEA; UMTRCA; 10 CFR Part 40, *Domestic Licensing of Source Material*; and DOE Order 435.1 Chg 1, *Radioactive Waste Management.*

- LM continues to operate and receive radioactive materials at the Grand Junction, Colorado, Disposal Site. This site is used for the permanent disposal of specific radioactive materials associated with the LM mission that is described in Sections 101 and 102 of Title I of UMTRCA and defined in the disposal facility waste acceptance criteria. The disposal cell is authorized by Congress to remain open until it reaches capacity or until 2023, whichever

comes first. Legislation has been proposed in the U.S. House of Representatives and the U.S. Senate to extend Congress's authorization to keep the disposal site open until 2048.

- During 2016, LLW associated with routine site inspections, construction projects, and the decommissioning and dismantlement of some elements of the Converted Advanced Wastewater Treatment Facility was generated at the Fernald Preserve, Ohio, Site. All LLW was shipped offsite to the Waste Control Specialists disposal facility in Andrews, Texas.
- During 2016, LLW was generated at the RFS that consisted of spent treatment media associated with the SPPTS. The waste was stored onsite awaiting disposal at the Energy Solutions Inc. Clive disposal facility in Grantsville, Utah.
- During 2016, the following radioactive waste streams generated at the Monticello, Utah, Disposal and Processing Site were disposed at the Grand Junction, Colorado, Disposal Site: spent groundwater treatment media, contaminated soils excavated from city streets and utilities, and contaminated debris removed from an onsite evaporation pond.

5.2 Radiation Protection Compliance

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

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

- Requirements for inspections, monitoring, and maintenance activities are specified in site-specific long-term surveillance plans and Groundwater Compliance Action Plans, which are reviewed and agreed to by NRC.
- Two LM-wide inspection and monitoring reports, one for Title I sites (https://energy.gov/lm/downloads/title-i-disposal-sites-annual-report-0) and one for Title II sites (https://energy.gov/lm/downloads/title-ii-disposal-sites-annual-report), describing activities and demonstrating protectiveness and compliance with the general licenses at each of the UMTRCA sites are compiled and submitted annually to NRC for each calendar year.
- Data Validation Packages are developed for every major sampling event and sent to NRC and placed on the applicable LM site webpage.

DOE Order 458.1 Chg 3, Radiation Protection of the Public and the Environment: DOE Order 458.1 establishes requirements to protect the public and the environment against undue risk from radiation associated with radiological activities conducted under the control of DOE.

- The LMS contractor continues to work toward full implementation of DOE Order 458.1, which replaced DOE Order 5400.5 Chg 2 in the LMS contract in July 2016.

5.3 Air Quality and Protection Compliance Status

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

- There were no major sources of criteria air pollutants or hazardous air pollutants at LM sites in 2016.
- Permits-by-rule applications were submitted and approved to operate three emergency generators at the Fernald Preserve, Ohio, Site during an extended power outage. Permits were closed when power was restored.

5.4 Water Quality and Protection Compliance Status

Clean Water Act (CWA): The CWA establishes the basic structure for regulating discharges of pollutants into the waters of the United States and regulating quality standards for surface waters. Under the CWA, EPA's National Pollutant Discharge Elimination System (NPDES) permit program controls discharges. In 2016, multiple LM sites maintained NPDES permits. These NPDES permits include discharge permits, storm water permits, and a Section 404 nationwide permit as described below:

- Compliance sampling is conducted at the Fernald Preserve, Ohio, Site for nonradiological pollutants from uncontrolled runoff and treated effluent discharges from the Fernald Preserve under a state-administrated NPDES permit.
- Treated groundwater at the Mound, Ohio, Site is discharged under a CERCLA authorization demonstrating compliance with the CWA. No discharge has occurred since September 15, 2014, to allow for undisturbed evaluation of the enhanced attenuation field demonstration that required injection of edible vegetable oil into the groundwater.
- An NPDES permit is maintained at the Weldon Spring, Missouri, Site. This permit covers discharges from the Leachate Collection and Removal System and is maintained as a contingency to current disposal methods. A renewal application for this permit was submitted on December 15, 2015. The permit remains in effect until it is renewed.

- LM terminated a no-longer-needed Section 404 nationwide permit Number 43 related to the 2012 breaching of earthen dams at the RFS.
- Pest management programs at LM sites are implemented in accordance with the EPA Pesticide General Permit or a state-issued general permit (for geographic areas where EPA is not the NPDES permitting authority).

CWA Stormwater Management and the EISA: A storm water management program was established by the CWA to reduce runoff and improve water quality. Under Section 438 of EISA, federal agencies are required to reduce storm water runoff from federal development and redevelopment projects to protect water resources. LM evaluates all construction projects involving footprints greater than 5000 square feet to ensure that predevelopment hydrology of the property is maintained or restored.

- LM terminated a storm water management plan at the Monticello, Utah, Disposal and Processing Sites. The storm water management plan, implemented for a large onsite construction project in 2014, was terminated because land disturbed by the construction project had adequately stabilized by 2016.
- LM managed site storm water at RFS during 2016 in accordance with its Erosion Control Plan, which meets the substantive requirements for storm water permitting. EPA is the NPDES permitting authority for the site and has approved this approach. Soil disturbances are controlled by institutional controls managed through the *Rocky Flats Legacy Management Agreement*.
- LM managed sitewide and construction storm water at the Fernald Preserve, Ohio, Site in accordance with the *Fernald Preserve, Fernald, Ohio, Storm Water Pollution Prevention Plan* (LMS/FER/S03161) and the current Fernald NPDES permit.

Safe Drinking Water Act (SDWA): The SDWA, enacted in 1974, authorized EPA to regulate contaminants in drinking water and required EPA to establish national standards to be implemented and enforced by authorized states. SDWA is an ARAR for many LM sites in regard to groundwater contamination. ARAR information is detailed in the environmental monitoring reports for each site.

Executive Order 11988, *Floodplain Management,* and *Executive Order 13690, New Federal Flood Risk Management Standard*: EO 11988, enacted in 1977, requires that federal agencies avoid, to the extent possible, short- or long-term work, activities, or disruption causing adverse impacts in floodplains and 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 federal, state, tribal, and local requirements, as applicable. EO 13690, enacted in 2015, upholds EO 11988 and provides a standard for consistent implementation and consideration of other factors such as climate science, sea level rise, ecosystem values, and the value of interagency as well as state and local input. Changes to flood hazard determinations are noted in the *Federal Register*, tracked for LM sites, and identified in the LMS *Environmental Compliance Regulatory Review Quarterly Report*.

Executive Order 11990 *Protection of Wetlands*: The purpose of EO 11990 is to "minimize the destruction, loss or degradation of wetlands and to preserve and enhance the natural and beneficial values of wetlands." To meet these objectives, EO 11990 requires LM to consider alternatives to work in or near wetland sites and to limit potential damage if an activity affecting

a wetland cannot be avoided. LM avoids conducting activities in or around wetlands that would adversely affect them. When unavoidable, LM complies with the requirements specific to the applicable nationwide permit and any applicable state or tribal requirements. LM promotes the ecological sustainability and enhancement of wetlands when considering the disposition and reuse of federal lands.

5.5 Other Environmental Statutes Compliance Status

National Environmental Policy Act (NEPA): NEPA was enacted in 1970 to help public officials make decisions that are based on an understanding of environmental consequences, to foster public participation, and to take actions that protect, restore, and enhance the environment. It requires federal agencies, including LM, to evaluate the potential environmental effects of proposed federal agency actions. NEPA documentation is typically not required for CERCLA sites that considered NEPA values in their decision documents. Actions at non-CERCLA LM sites are typically within classes of actions that are categorically excluded. The evaluations of these actions are documented in Environmental Checklists and Categorical Exclusion Determination Forms, the latter of which are accessible to public review on the DOE and LM NEPA websites.

An annual summary of proposed or ongoing environmental assessments, environmental impact statements, and mitigation action plans is provided to the DOE Office of General Counsel and reported on the following website: https://energy.gov/lm/services/joint-environmental-management-system-ems/national-environmental-policy-act-nepa.

- LM NEPA documents completed during the reporting period included:
  - Environmental checklists: 16
  - Environmental assessments: 0
  - Environmental impact statements: 0
- Environmental assessments were initiated for the Central Nevada Test Area and the Bear Creek, Wyoming, Disposal Site during this reporting period and are ongoing. Additionally, an environmental assessment was cancelled for the Tuba City, Arizona, Disposal Site.

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

- LM completed a programmatic biological assessment in September 2016 to assess impacts to the Gunnison sage-grouse and western yellow-billed cuckoo and their designated and proposed critical habitat for actions on the ULP tracts. With submission of the biological

assessment, LM initiated formal consultation with USFWS on these species. LM also began biological assessments for these species at the Gunnison, Colorado, Disposal and Processing Site and the Monticello, Utah, Disposal and Processing Sites and continues to evaluate potential impacts on these species from activities at other sites.

- In some instances, water depletions from river basins may affect federally listed fish species in the Colorado River. LM continued to track water use related to LM site activities and continued to evaluate the basin-wide effects of activities on these listed species.
- LM submitted a biological assessment to the USFWS that assessed impacts to the Preble's meadow jumping mouse for the Mound Site Plume Treatment System (MSPTS) reconfiguration project at RFS. LM received a biological opinion for the project from the USFWS on June 16, 2016, and the project was completed. Several other project notifications were made to the USFWS in accordance with the requirements in the programmatic biological assessment that LM has with the USFWS for RFS.
- A biological survey was conducted at the Fernald Preserve, Ohio, Site before the North Woodlot Enhancement Project to determine if federally endangered running buffalo clover was present along Paddys Run. No habitat was identified.
- The American burying beetle release at the Fernald Preserve, Ohio, Site took place in May and July 2016 as part of ongoing efforts to increase the population of this federally listed endangered species.

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

- LM submitted a report for the Council for the Conservation of Migratory Birds to DOE's Office of Sustainable Environmental Stewardship in 2016 detailing actions LM completed during the previous year to protect migratory birds.
- The MSPTS reconfiguration project at RFS was scheduled to begin during the 2016 nesting season. To minimize the potential for impacting nesting migratory birds, the project area was mowed before the nesting season and maintained with short grass to deter nesting birds. In addition, other nesting deterrents such as coyote cutouts were installed at the MSPTS and the Solar Ponds Plume Treatment System (SPPTS) reconfiguration project. These activities kept nesting birds out of the project areas, and the projects were completed without any bird issues.
- The Fernald Preserve, Ohio, Site, maintains a Nest Destruction Permit that is issued by the Ohio Department of Natural Resources. This permit is for the removal of Canada geese nests and eggs, if they are determined to be a nuisance.

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

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

National Historic Preservation Act (NHPA): This act established a comprehensive national policy concerning historic and archaeological resource protection. Federal historic preservation regulations, such as the Section 106 process, are based on this act. The Section 106 process directs federal agencies to consider the effects of federal projects on historic and archaeological resources, even if projects are not located on federal lands (i.e., LM must consider projects on both LM-administered and non-LM-administered property). LM complies with NHPA Section 106 by using subcontractors for cultural resource inventories before commencing ground-disturbing activities.

- In 2016, the following cultural resource inventories were conducted:
  - L-Bar, New Mexico, Disposal Site (an UMTRCA Title II site): A 2.24-acre archaeological survey was completed in support of proposed road and fence maintenance activity at this site. No properties of historical significance were identified within the proposed work areas. The New Mexico State Historic Preservation Officer (SHPO) agreed with the findings of the survey.
  - Bluewater, New Mexico, Disposal Site (an UMTRCA Title II site): A 4.5-acre archaeological survey was completed before performing a pedogenesis study at this site. No properties of historic significance were identified within the proposed work areas. The New Mexico SHPO agreed with the findings of the survey.
  - Tuba City, Arizona, Disposal Site (an UMTRCA Title I site): A 246-acre archaeological survey was completed at this site before installation of 26 new groundwater monitoring wells in the region surrounding this site. No additional properties of historic significance were identified within the proposed work area. An existing historic property (archaeological site) was remapped during the survey and avoided during well installation. The Navajo Nation Tribal Historic Preservation Officer agreed with the findings of the survey.
- LM continued to provide support to the Riverview Technology Corporation (RTC), the local property owner of the Grand Junction, Colorado, Site, to get the site listed on the National Register of Historic Places (NR). The Grand Junction site demonstrated historical significance for technological advances in uranium exploration and milling during World War II and the Cold War. LM provided support for the nomination at a March 11, 2016, meeting at History Colorado. The Grand Junction, Colorado, Site was formally listed as an NR historic district on July 26, 2016.
- LM continued to provide ongoing support to the RTC for the rehabilitation of the log cabin, one of the oldest buildings on the Grand Junction site. The cabin was the administrative center of the facility when the Grand Junction site was operated by the Manhattan Engineer District during World War II (1943–1945). The cabin is being rehabilitated into an interpretive center where visitors can learn about the site's historic missions during World War II and the Cold War (1945–1991).

5.6 Summary of Environmental Violations

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

- In November 2016, the Alaska Department of Fish and Game notified LM that LM failed to submit a collection report by the July 30, 2016, due date as required by the Fish Resource Permit (CF-16-074) for the Amchitka, Alaska, Site. The notification of noncompliance required the filing of an Occurrence Reporting and Processing System report. The LMS contractor submitted the required report in December 2016.

6.0 Additional Natural and Cultural Resources Management

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

- LM submits a *Report on Federal Archaeology Program Activities* annually to the DOE Office of Environment, Health, Safety and Security. The Office of Sustainable Environmental Stewardship compiles reports from all DOE offices and submits them to the Department of the Interior's National Park Service. The report summarizes annual activities related to cultural resources and includes the total acreage surveyed to date, the number of cultural sites determined to be eligible or ineligible for the NR, and the costs associated with managing the cultural resources program.
- On May 19, 2015, the secretary of the Department of Agriculture and the administrator of the EPA, on behalf of the Pollinator Health Task Force, issued the *National Strategy to Promote the Health of Honey Bees and Other Pollinators*. Developed through a collaborative effort across the executive branch, this strategy outlines a comprehensive approach to tackling and reducing the impact of multiple stressors on pollinator health, including pests and pathogens, reduced habitat, lack of nutritional resources, and exposure to pesticides. LM formed a group to assess pollinator health and potential efforts to reduce pollinator stressors at LM sites.
    - LM's Ecosystem Management Team tracks the acreage and types of pollinator-friendly best management practices (BMPs) implemented at LM sites between May 1 of each year and April 30 of the following year. In April 2016, LM reported the implementation of BMPs over 2495.5 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, Ohio, Site, issued by the Ohio Department of Natural Resources
    - Special-Purpose Salvage Permit for the Fernald Preserve, Ohio, Site, issued by the USFWS

7.0 Summary of Groundwater Protection Program

This section summarizes the site-specific groundwater monitoring program for applicable LM sites. For each LM site with a groundwater monitoring program, Table 4 of Attachment 1 presents the following information:

- Whether the site is regularly sampled for radiological analytes (including uranium isotopes)
- Whether the site is regularly sampled for nonradiological analytes (including elemental uranium)
- A list of the contaminants of concern (COCs)
- The number of active monitoring wells that are sampled for groundwater monitoring purposes
- The number of point of compliance (POC) wells, defined as wells at which regulatory standards apply
- COC exceedances at POC wells during the reporting period

Reports discussing COC exceedances at POC wells are referenced in the Attachment 1, Table 4, footnotes and are available at the LM public website.

8.0 Summary of Environmental Radiation Protection Program

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

LM uses the RPP at all LM sites and activities to ensure that radiation exposure to workers and the public and releases of radioactivity to the environment are maintained below regulatory limits and to further reduce exposures and releases to levels as low as reasonably achievable. Environmental cleanup at LM sites was completed according to all applicable statutes and regulations, and LM conducts LTS&M to verify that site conditions have not changed and that established institutional controls remain effective. There were no unplanned radiological discharges in 2016.

8.1 Clearance of Property

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

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

- In 2016, the LMS contractor performed radiological unrestricted release (clearance) surveys of two identical liquid scintillation counters and their associated components that were used at the Mound, Ohio, Site. After the units were classified to no longer be of use by the site, they were posted as excess property to the General Services Administration website, GSAXcess.gov. As no interested parties were identified, LM approved the disposal path of returning the equipment to the manufacturer, PerkinElmer. Before being released to PerkinElmer, the units were radiologically surveyed and found to meet the unrestricted release requirements of 10 CFR Part 835 Appendix D, "Surface Contamination Values," which are the preapproved, authorized limits for release or clearance of this type of personal property. An independent verification survey was not performed, as the complexity of the radiological survey was considered minimal.
- No other property (real or personal) was cleared from LM sites in 2016.

9.0 Summary of Quality Assurance

Quality Assurance provides a management system 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 system incorporates the requirements of DOE Order 414.1D, *Quality Assurance*, using ISO standard 9001:2015, *Quality Management Systems–Requirements*, as the national standard, as well as DOE Order 226.1B, *Implementation of Department of Energy Oversight Policy.*

The Quality Assurance management system ensures that requirements are identified and integrated into LM procedures and 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 LMS performance. Assessments are planned and recorded on an annual schedule, and issues are tracked in the Corrective Action Tracking System. The annual assessment schedule includes independent assessments conducted by assessors independent of the area or function being assessed,

management assessments conducted as self-assessments, and surveillances conducted by Quality Assurance staff.

The Quality Assurance program includes the identification and control of items and equipment for sampling control and analysis. Additional site-specific requirements for sampling activities at LM sites are defined in the *Sampling and Analysis Plan for the U.S. Department of Energy Office of Legacy Management Sites*, also called the LM Sampling and Analysis Plan (LMS/PRO/S04351). This document provides detailed procedures for the field sampling teams so that water, air, soil and sediment, and ecological samples are collected in a consistent and technically defensible manner. These procedures are reviewed annually and updated as required to ensure that the most up-to-date processes are used.

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

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

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

This page intentionally left blank

Attachment 1

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

This page intentionally left blank

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

FUSRAP Sites
Acid/Pueblo Canyon, NM, Site https://www.lm.doe.gov/Acid/Sites.aspx
Albany, OR, Site https://www.lm.doe.gov/Albany/Sites.aspx
Bayo Canyon, NM, Site https://www.lm.doe.gov/bayo/Sites.aspx
Berkeley, CA, Site https://www.lm.doe.gov/berkeley/Sites.aspx
Beverly, MA, Site https://www.lm.doe.gov/beverly/Sites.aspx
Buffalo, NY, Site https://www.lm.doe.gov/buffalo/Sites.aspx
Chicago North, IL, Site https://www.lm.doe.gov/chicago_north/Sites.aspx
Chupadera Mesa, NM, Site https://www.lm.doe.gov/chupadera/Sites.aspx
Columbus East, OH, Site https://www.lm.doe.gov/columbus_east/Sites.aspx
Fairfield, OH, Site https://www.lm.doe.gov/fairfield/Sites.aspx
Granite City, IL, Site https://www.lm.doe.gov/granite_city/Sites.aspx
Hamilton, OH, Site https://www.lm.doe.gov/hamilton/Sites.aspx
Indian Orchard, MA, Site https://www.lm.doe.gov/indian_orchard/Sites.aspx
Jersey City, NJ, Site https://www.lm.doe.gov/jersey_city/Sites.aspx
New York, NY, Site https://www.lm.doe.gov/new_york/Sites.aspx
Niagara Falls Storage Site Vicinity Properties, NY, Site https://www.lm.doe.gov/niagara/vicinity/Sites.aspx
Oak Ridge, TN, Warehouses Site https://www.lm.doe.gov/oakridge/Sites.aspx
Oxford, OH, Site https://www.lm.doe.gov/oxford/Sites.aspx
Springdale, PA, Site https://www.lm.doe.gov/springdale/Sites.aspx
Toledo, OH, Site https://www.lm.doe.gov/toledo/Sites.aspx
Tonawanda North, NY, Site Unit 1 https://www.lm.doe.gov/tonawanda/Sites.aspx
Tonawanda North, NY, Site Unit 2 https://www.lm.doe.gov/tonawanda/Sites.aspx
Wayne, NJ, Site https://www.lm.doe.gov/wayne/Sites.aspx
CERCLA/RCRA Sites
Maxey Flats, KY, Disposal Site https://www.lm.doe.gov/maxey_flats/Sites.aspx
Nevada Offsites
Chariot, AK, Site https://www.lm.doe.gov/Chariot/Sites.aspx
Other/Additional Sites
Ashtabula, OH, Site https://www.lm.doe.gov/Ashtabula/Sites.aspx
Center for Energy and Environmental Research, PR, Site https://www.lm.doe.gov/CEER/Sites.aspx
Columbus, OH, Site https://www.lm.doe.gov/Columbus/Sites.aspx
El Verde, PR, Site https://www.lm.doe.gov/El_Verde/Sites.aspx
General Atomics Hot Cell Facility, CA, Site https://www.lm.doe.gov/general_atomic/Sites.aspx
Geothermal Test Facility, CA, Site https://www.lm.doe.gov/geothermal/Sites.aspx
Inhalation Toxicology Laboratory, NM, Site https://www.lm.doe.gov/ITL/Sites.aspx
Missouri University Research Reactor, MO, Site https://www.lm.doe.gov/MURR/Sites.aspx
Oxnard, CA, Site https://www.lm.doe.gov/oxnard/Sites.aspx
Vallecitos Nuclear Center, CA, Site https://www.lm.doe.gov/Vallecitos/Sites.aspx

Table 2: Category 2 Sites
(Typically involves routine inspection and maintenance, records-related activities, and stakeholder support)

Site Name	Type of Data Collected					Where Data Are Reported					
	Inspection	Groundwater and/or Surface Water Monitoring	Production Water and Gas Monitoring	Chemical Inventory[a]	Other Environmental Monitoring (biological, soil, etc.)	Site Inspection Report	CERCLA Five-Year Review Report	Annual Site Inspection and Monitoring Report for UMTRCA Title I or Title II Sites	Environmental Monitoring Report[b]	EPCRA Report	GEMS[c]
UMTRCA Sites											
Ambrosia Lake, NM, Disposal Site https://www.lm.doe.gov/Ambrosia/Sites.aspx	x	x						x	x		x
Bluewater, NM, Disposal Site https://www.lm.doe.gov/bluewater/Sites.aspx	x	x						x	x		x
Burrell, PA, Disposal Site https://www.lm.doe.gov/burrell/Sites.aspx	x	x						x	x		x
Canonsburg, PA, Disposal Site https://www.lm.doe.gov/canonsburg/Sites.aspx	x	x						x	x		x
Edgemont, SD, Disposal Site https://www.lm.doe.gov/edgemont/Sites.aspx	x							x			x
Falls City, TX, Disposal Site https://www.lm.doe.gov/falls/Sites.aspx	x	x						x	x		x
Green River, UT, Disposal Site https://www.lm.doe.gov/green_river/Sites.aspx	x	x						x	x		x
Gunnison, CO, Processing Site https://www.lm.doe.gov/Gunnison/Processing/Sites.aspx		x							x		x
Gunnison, CO, Disposal Site https://www.lm.doe.gov/Gunnison/Disposal/Sites.aspx	x	x						x	x		x
Lakeview, OR, Processing Site https://www.lm.doe.gov/Lakeview/Processing/Sites.aspx		x							x		x
Lakeview, OR, Disposal Site https://www.lm.doe.gov/Lakeview/Disposal/Sites.aspx	x	x						x	x		x
L-Bar, NM, Disposal Site https://www.lm.doe.gov/Lbar/Sites.aspx	x	x						x	x		x
Lowman, ID, Disposal Site https://www.lm.doe.gov/lowman/Sites.aspx	x							x			x
Maybell, CO, Disposal Site https://www.lm.doe.gov/Maybell/Sites.aspx	x							x			x
Maybell West, CO, Disposal Site https://www.lm.doe.gov/Maybell_West/Sites.aspx	x							x			x
Mexican Hat, UT, Disposal Site https://www.lm.doe.gov/Mexican_Hat/Sites.aspx	x				x			x			x
Monument Valley, AZ, Processing Site https://www.lm.doe.gov/MonValley/Sites.aspx		x			x				x		x
Naturita, CO, Processing Site https://www.lm.doe.gov/Naturita/Processing/Sites.aspx		x							x		x
Naturita, CO, Disposal Site https://www.lm.doe.gov/Naturita/Disposal/Sites.aspx	x							x			x

Table 2: Category 2 Sites
(Typically involves routine inspection and maintenance, records-related activities, and stakeholder support)

Site Name	Type of Data Collected					Where Data Are Reported					
	Inspection	Groundwater and/or Surface Water Monitoring	Production Water and Gas Monitoring	Chemical Inventory[a]	Other Environmental Monitoring (biological, soil, etc.)	Site Inspection Report	CERCLA Five-Year Review Report	Annual Site Inspection and Monitoring Report for UMTRCA Title I or Title II Sites	Environmental Monitoring Report[b]	EPCRA Report	GEMS[c]
UMTRCA Sites (continued)											
Old Rifle, CO, Processing Site https://www.lm.doe.gov/Rifle/Old_Processing/Sites.aspx		x							x		x
New Rifle, CO, Processing Site https://www.lm.doe.gov/Rifle/New_Processing/Sites.aspx		x							x		x
Rifle, CO, Disposal Site https://www.lm.doe.gov/Rifle/Disposal/Sites.aspx	x	x						x	x		x
Riverton, WY, Processing Site https://www.lm.doe.gov/Riverton/Sites.aspx		x							x		x
Salt Lake City, UT, Processing Site https://www.lm.doe.gov/Salt_Lake/Processing/Sites.aspx											x
Salt Lake City, UT, Disposal Site https://www.lm.doe.gov/Salt_Lake/Disposal/Sites.aspx	x							x			x
Sherwood, WA, Disposal Site https://www.lm.doe.gov/sherwood/Sites.aspx	x	x			x			x	x		x
Shirley Basin South, WY, Disposal Site https://www.lm.doe.gov/Shirley_Basin/Sites.aspx	x	x						x	x		x
Slick Rock, CO, Processing Site https://www.lm.doe.gov/Slick_Rock/Processing/Sites.aspx		x							x		x
Slick Rock, CO, Disposal Site https://www.lm.doe.gov/Slick_Rock/Disposal/Sites.aspx	x							x			x
Spook, WY, Disposal Site https://www.lm.doe.gov/Spook/Sites.aspx	x							x			x
D&D Sites											
BONUS, PR, Decommissioned Reactor Site https://www.lm.doe.gov/bonus/Sites.aspx	x					x					x
Grand Junction, CO, Site https://www.lm.doe.gov/Grand_Junction/Sites.aspx	x	x		x		x			x		x
Hallam, NE, Decommissioned Reactor Site https://www.lm.doe.gov/hallam/Sites.aspx	x	x				x			x		x
Piqua, OH, Decommissioned Reactor Site https://www.lm.doe.gov/Piqua/Sites.aspx	x					x					x
Site A/Plot M, IL, Decommissioned Reactor Site https://www.lm.doe.gov/SiteA_PlotM/Sites.aspx	x	x				x			x		x

Table 2: Category 2 Sites
(Typically involves routine inspection and maintenance, records-related activities, and stakeholder support)

Site Name	Type of Data Collected					Where Data Are Reported					
	Inspection	Groundwater and/or Surface Water Monitoring	Production Water and Gas Monitoring	Chemical Inventory[a]	Other Environmental Monitoring (biological, soil, etc.)	Site Inspection Report	CERCLA Five-Year Review Report	Annual Site Inspection and Monitoring Report for UMTRCA Title I or Title II Sites	Environmental Monitoring Report[b]	EPCRA Report	GEMS[c]
Nevada Offsites											
Amchitka, AK, Site https://www.lm.doe.gov/Amchitka/Sites.aspx	x				x	x			x		x
Central Nevada Test Area, NV, Site https://www.lm.doe.gov/CNTA/Sites.aspx	x	x				x			x		x
Gasbuggy, NM, Site https://www.lm.doe.gov/Gasbuggy/Sites.aspx		x							x		x
Gnome-Coach, NM, Site https://www.lm.doe.gov/Gnome/Sites.aspx	x	x				x			x		x
Rio Blanco, CO, Site https://www.lm.doe.gov/Rio_Blanco/Sites.aspx		x	x						x		x
Rulison, CO, Site https://www.lm.doe.gov/Rulison/Sites.aspx		x	x						x		x
Salmon, MS, Site https://www.lm.doe.gov/salmon/Sites.aspx	x	x				x			x		x
Shoal, NV, Site https://www.lm.doe.gov/Shoal/Sites.aspx	x	x				x			x		x
Nuclear Waste Policy Act Section 151 Site											
Parkersburg, WV, Disposal Site https://www.lm.doe.gov/parkersburg/Sites.aspx	x	x				x			x		x
FUSRAP Sites											
Adrian, MI, Site https://www.lm.doe.gov/Adrian/Sites.aspx	x					x					
Albany, OR, Site https://www.lm.doe.gov/Albany/Sites.aspx	x					x					
Aliquippa, PA, Site https://www.lm.doe.gov/Aliquippa/Sites.aspx	x					x					
Burris Park, CA, Site https://www.lm.doe.gov/BurrisPark/Sites.aspx	x					x					
Chicago South, IL, Site https://www.lm.doe.gov/chicago_south/Sites.aspx	x					x					
Fairfield, OH, Site https://www.lm.doe.gov/fairfield/Sites.aspx	x					x					
Madison, IL, Site https://www.lm.doe.gov/madison/Sites.aspx	x					x					
New Brunswick, NJ, Site https://www.lm.doe.gov/New_Brunswick/Sites.aspx	x					x					

Table 2: Category 2 Sites
(Typically involves routine inspection and maintenance, records-related activities, and stakeholder support)

Site Name	Type of Data Collected					Where Data Are Reported					
	Inspection	Groundwater and/or Surface Water Monitoring	Production Water and Gas Monitoring	Chemical Inventory[a]	Other Environmental Monitoring (biological, soil, etc.)	Site Inspection Report	CERCLA Five-Year Review Report	Annual Site Inspection and Monitoring Report for UMTRCA Title I or Title II Sites	Environmental Monitoring Report[b]	EPCRA Report	GEMS[c]
FUSRAP Sites (continued)											
Niagara Falls Storage Site Vicinity Properties, NY, Site https://www.lm.doe.gov/niagara/vicinity/Sites.aspx	x					x					
Painesville, OH, Site https://www.lm.doe.gov/Painesville/Sites.aspx	x					x					
Seymour, CT, Site https://www.lm.doe.gov/seymour/Sites.aspx	x					x					
CERCLA/RCRA Sites											
Laboratory for Energy Related Health Research, CA, Site https://www.lm.doe.gov/LEHR/Sites.aspx	x	x				x	x		x		x

Notes:
[a] Certain sites conduct chemical inventories to ensure compliance with EPCRA.
[b] Types of environmental monitoring reports include:

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

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

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

Table 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	NPDES Report	Environmental Monitoring Report[b]	GEMS[c]
UMTRCA Sites												
Durango, CO, Processing Site https://www.lm.doe.gov/Durango/Processing/Sites.aspx		x									x	x
Durango, CO, Disposal Site https://www.lm.doe.gov/Durango/Disposal/Sites.aspx	x	x						x			x	x
Grand Junction, CO, Processing Site https://www.lm.doe.gov/Grand_Junction_DP/Processing/Sites.aspx	x	x				x					x	x
Grand Junction, CO, Disposal Site https://www.lm.doe.gov/Grand_Junction_DP/Disposal/Sites.aspx	x	x			x			x			x	x
Shiprock, NM, Disposal Site https://www.lm.doe.gov/Shiprock/Sites.aspx	x	x		x				x			x	x
Tuba City, AZ, Disposal Site https://www.lm.doe.gov/Tuba/Sites.aspx	x	x	x		x			x	x		x	x
CERCLA/RCRA Sites												
Fernald Preserve, OH, Site[d] https://www.lm.doe.gov/Fernald/Sites.aspx	x	x	x	x	x	x	x			x	x	x
Monticello, UT, Processing Site https://www.lm.doe.gov/Monticello/Sites.aspx	x	x	x			x	x				x	x
Monticello, UT, Disposal Site https://www.lm.doe.gov/Monticello/Sites.aspx	x	x	x			x	x				x	x
Mound, OH, Site https://www.lm.doe.gov/Mound/Sites.aspx	x	x	x		x	x	x			x	x	x
Pinellas County, FL, Site https://www.lm.doe.gov/pinellas/Sites.aspx	x	x									x	x
Rocky Flats Site, CO https://www.lm.doe.gov/Rocky_Flats/Sites.aspx	x	x		x	x	x	x		x		x	x
Weldon Spring, MO, Site https://www.lm.doe.gov/Weldon/Sites.aspx	x	x			x	x	x			x	x	x

Notes:

[a] Certain sites conduct chemical inventories to ensure compliance with EPCRA.

[b] Types of Environmental Monitoring Reports include:

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

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

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

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

Table 4. Calendar Year 2016 Groundwater Monitoring Program Summary

Site Name	Rad Monitoring[a]	Non-Rad Monitoring[b]	COCs[c]	Active Wells	POC Wells[d]	Exceedance at POC Wells
UMTRCA Sites						
Ambrosia Lake, NM, Disposal Site		x	Molybdenum, nitrate + nitrite as nitrogen, selenium, uranium	3	0	N/A
Bluewater, NM, Disposal Site		x	Molybdenum, polychlorinated biphenyls, selenium, uranium	19	5	No
Burrell, PA, Disposal Site		x	Calcium, chloride, iron, lead, magnesium, manganese, molybdenum, nitrate as nitrogen, potassium, selenium, sodium, sulfate, total dissolved solids, uranium	8	0	N/A
Canonsburg, PA, Disposal Site		x	Uranium	5	3	No
Durango, CO, Disposal Site		x	Molybdenum, selenium, uranium	7	3	No
Durango, CO, Processing Site		x	**Cadmium**, **manganese**, molybdenum, **selenium**, **sulfate**, **uranium**	13	8	Yes[e]
Falls City, TX, Disposal Site		x	Uranium	12	0	N/A
Grand Junction, CO, Disposal Site		x	Molybdenum, nitrate as nitrogen, polychlorinated biphenyls, selenium, sulfate, total dissolved solids, uranium, vanadium	3	0	N/A
Grand Junction, CO, Processing Site		x	Ammonia (as NH_4), molybdenum, uranium	4	0	N/A
Green River, UT, Disposal Site		x	Nitrate, sulfate, uranium	18	4	No
Gunnison, CO, Disposal Site		x	Calcium, chloride, iron, magnesium, manganese, potassium, sodium, sulfate, total dissolved solids, uranium	16	6	No
Gunnison, CO, Processing Site		x	**Manganese**, **uranium**	33	26	Yes[f]
Lakeview, OR, Disposal Site		x	Arsenic, cadmium, uranium	9	8	No
L-Bar, NM, Disposal Site		x	Chloride, nitrate + nitrite as nitrogen, selenium, sulfate, total dissolved solids, uranium	10	4	No
Monument Valley, AZ, Processing Site		x	Nitrate as nitrogen, sulfate, uranium	46	0	N/A
Naturita, CO, Processing Site		x	Uranium, vanadium	8	4	No
Rifle, CO Processing (New) Site		x	**Arsenic**, molybdenum, **nitrate as nitrogen**, **selenium**, **uranium**, **vanadium**	16	4	Yes[g]
Rifle, CO Processing (Old) Site		x	**Selenium, uranium**, vanadium,	8	8	Yes[h]
Riverton, WY, Processing Site		x	Manganese, **molybdenum**, **sulfate**, **uranium**	70	53	Yes[i]
Sherwood, WA, Disposal Site		x	Chloride, sulfate, total dissolved solids	3	0	N/A
Shiprock, NM, Disposal Site		x	Ammonium, manganese, nitrate, selenium, strontium, sulfate, uranium	128	0	N/A
Shirley Basin South, WY, Disposal Site	x	x	Cadmium, chromium, lead, nickel, radium-226, **radium-228**, selenium, thorium-230, uranium	14	4	Yes[j]
Slick Rock, CO, Processing Site	x	x	**Benzene**, manganese, **molybdenum**, **nitrate**, radium-226, radium-228, **selenium**, toluene, **uranium**	13	13	Yes[k]
Tuba City, AZ, Disposal Site		x	**Molybdenum, nitrate, selenium, uranium**	124	124	Yes[l]

Table 4. Calendar Year 2016 Groundwater Monitoring Program Summary (continued)

Site Name	Rad Monitoring[a]	Non-Rad Monitoring[b]	COCs[c]	Active Wells	POC Wells[d]	Exceedance at POC Wells
CERCLA/RCRA Sites						
Fernald Preserve, OH, Site	x	x	Alpha-chlordane, **antimony**, aroclor-1254, arsenic, barium, beryllium, benzene, bis(2-chloroisopropyl) ether, bis(2-ethylhexyl) phthalate, boron, bromodichloromethane, bromomethane, cadmium, carbazole, carbon disulfide, chloroethane, chloroform, chromium(VI), cobalt, copper, fluoride, **lead**, **manganese**, mercury, methylene chloride, **molybdenum**, neptunium-237, nickel, **nitrate + nitrite**, octachlorodibenzo-*p*-dioxin, radium-226, radium-228, selenium, silver, strontium-90, **technetium-99**, thorium-228, thorium-230, thorium-232, trichloroethene, **total uranium**, vanadium, vinyl chloride, **zinc**, 1,1-dichloroethane, 1,1-dichloroethene, 1,2-dichloroethane, 4-methylphenol, 4-nitrophenol, and 2,3,7,8-tetrachlorodibenzo-*p*-dioxin	179	179	Yes[m]
Monticello, UT, Disposal and Processing Sites	x	x	Arsenic, gross alpha activity, gross beta activity, manganese, molybdenum, nitrate, selenium, uranium, vanadium	157	0	N/A
Mound, OH, Site	x	x	Tetrachloroethene, trichloroethene, tritium, vinyl chloride, *cis*-1,2-dichloroethene, *trans*-1,2-dichloroethene	39	0	N/A
Pinellas County, FL, Site		x	Benzene, trichloroethene, vinyl chloride, 1,1-dichloroethene, 1,4-dioxane, *cis*-1,2-dichloroethene, *trans*-1,2-dichloroethene	150	0	N/A
Rocky Flats Site, CO	x	x	Volatile organic compounds, semi-volatile organic compounds, metals, plutonium, americium, uranium, nitrate (for a detailed list of COCs, see the site webpage)	88	0	N/A
Weldon Spring, MO, Site	x	x	Nitrate, nitrobenzene, trichloroethene, uranium, 1,3-dinitrobenzene, 2,4-dinitrotoluene, 2,6-dinitrotoluene, 2,4,6-trinitrotoluene	106	0	N/A
D&D Sites						
Grand Junction, CO, Site		x	Manganese, **molybdenum**, **selenium**, sulfate, **uranium**	7	7	Yes[n]
Hallam, NE, Decommissioned Reactor Site	x		Gamma-emitting nuclides, gross alpha, gross beta, nickel-63, tritium	19	0	N/A
Site A/Plot M, IL, Decommissioned Reactor Site	x		Strontium-90, tritium	19	0	N/A

Table 4. Calendar Year 2016 Groundwater Monitoring Program Summary (continued)

Site Name	Rad Monitoring[a]	Non-Rad Monitoring[b]	COCs[c]	Active Wells	POC Wells[d]	Exceedance at POC Wells
Nevada Offsites						
Central Nevada Test Area, NV	x		Carbon-14, iodine-129, tritium	10	9	No
Gasbuggy, NM, Site	x		Gamma-emitting nuclides, tritium	5	0	N/A
Gnome-Coach, NM, Site	x		Cesium-137, strontium-90, tritium	5	0	N/A
Rio Blanco, CO, Site	x		Gamma-emitting nuclides, tritium	4	0	N/A
Rulison, CO, Site	x		Gamma-emitting nuclides, tritium	1	0	N/A
Salmon, MS, Site	x	x	Arsenic, barium, gamma-emitting nuclides, gross alpha, gross beta, lead, tritium	32	0	N/A
Shoal, NV, Site	x	x	Carbon-14, iodine-129, tritium	13	9	No
Nuclear Waste Policy Act Section 151 Site						
Parkersburg, WV, Disposal Site	x	x	Antimony, barium, beryllium, cadmium, calcium, chloride, chromium, gross alpha, gross beta, hafnium, lead, magnesium, mercury, nickel, nitrate + nitrite, potassium, radium-226, radium-228, selenium, sodium, sulfate, thallium, thiocyanate, uranium, zirconium	6	0	N/A

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

Reports that document 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://energy.gov/lm/office-legacy-management).
[e] Durango, CO, Processing Site: will be included in the *2019 Verification Monitoring Report for the Durango, Colorado, Processing Site.*
[f] Gunnison, CO, Processing Site: *2016 Verification Monitoring Report for the Gunnison, Colorado, Processing Site* (estimated October 2017).
[g] Rifle, CO, Processing (New) Site: Data Validation Package for June 2016 Groundwater and Surface Water Sampling at the Old and New Rifle, Colorado, Processing Sites (September 2016).
[h] Rifle, CO, Processing (Old) Site: Data Validation Package for June 2016 Groundwater and Surface Water Sampling at the Old and New Rifle, Colorado, Processing Sites (September 2016).
[i] Riverton, WY, Processing Site: *2016 Verification Monitoring Report, Riverton, Wyoming, Processing Site* (estimated October 2017).
[j] Shirley Basin South, WY, Disposal Site: *Data Validation Package for July 2016 Groundwater Sampling at the Shirley Basin South, Wyoming, Disposal Site* (November 2016).
[k] Slick Rock, CO, Processing Site: *Verification Monitoring Report for the Slick Rock, Colorado, Processing Sites: September 2016 Sampling* (January 2017).
[l] Tuba City, AZ, Disposal Site: *Data Validation Package for August 2016 Groundwater and Surface Water Sampling at the Tuba City, Arizona, Disposal Site* (February 2017).
[m] Fernald, OH, Site: *Fernald Preserve 2016 Site Environmental Report* (May 2017).
[n] Grand Junction, CO, Site: *Data Validation Package February 2017 Groundwater and Surface Water Sampling at the Grand Junction, Colorado, Site* (May 2017).

Abbreviation:
N/A: Not applicable

This page intentionally left blank