

2. Compliance Summary

Lawrence Livermore National Laboratory (LLNL) activities comply with federal, state, and local environmental regulations, internal requirements, Executive Orders, and U.S. Department of Energy (DOE) Orders as specified in Contract DE-AC52-07NA27344. This chapter provides an overview of LLNL's compliance programs and activities during 2016, as well as a listing of all active environmental permits.

2.1 Environmental Restoration and Waste Management

2.1.1 Comprehensive Environmental Response, Compensation and Liability Act

Ongoing remedial investigations and cleanup activities for legacy contamination of environmental media at LLNL fall under the jurisdiction of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), Title I of the Superfund Amendments and Reauthorization Act (SARA). CERCLA is commonly referred to as the Superfund law.

CERCLA compliance activities for the Livermore Site and Site 300 are summarized in **Sections 2.1.1.1** and **2.1.1.2**. Community relations activities conducted by DOE/LLNL are also part of these projects. See **Chapter 7** for more information on the activities and findings of the investigations.

2.1.1.1 Livermore Site Ground Water Project

The Livermore Site came under CERCLA in 1987 when it was placed on the National Priorities List. The Livermore Site Ground Water Project (GWP) complies with provisions specified in a Federal Facility Agreement (FFA) entered into by the U.S. Environmental Protection Agency (EPA), DOE, the California EPA's Department of Toxic Substances Control (DTSC), and the San Francisco Bay Regional Water Quality Control Board (SFBRWQCB). As required by the FFA, the GWP addresses compliance issues by investigating potential contamination source areas (e.g., suspected old release sites, solvent-handling areas, leaking underground tank systems), monitoring water quality through an extensive network of wells, and remediating contaminated soil and groundwater. The primary soil and groundwater contaminants (constituents of concern) are common volatile organic compounds (VOCs), primarily trichloroethylene (TCE) and perchloroethylene (PCE). Background information on LLNL Livermore Site environmental characterization and restoration activities are presented in the *CERCLA Remedial Investigation Report for the LLNL Livermore Site* (Thorpe et al. 1990). The *LLNL Ground Water Project 2016 Annual Report* (McKereghan et al. 2017) presents the current status of clean up at the Livermore Site.

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Regulatory Milestones. In calendar year 2016, the following deliverables were submitted to the regulatory agencies:

- Fourth Quarter 2015 Self-Monitoring Report
- 2015 LLNL Ground Water Project Annual Report
- First, Second, and Third Quarter 2016 Self-Monitoring Report
- Work Plans for Well and Borehole Drilling at the Livermore Site in FY2016

Treatment Facilities. During 2016, the Livermore GWP maintained 28 groundwater and 8 soil vapor treatment facilities. The groundwater extraction wells and dual phase extraction wells extracted about 965 million L of groundwater during 2016. The dual-phase extraction wells and soil-vapor extraction wells together removed approximately 1.6 million m³ of soil vapor.

In 2016, the Livermore GWP treatment facilities removed about 44 kg of VOCs. Since remediation efforts began in 1989, more than 21.6 billion L of groundwater and approximately 21.7 million m³ of soil vapor have been treated, removing about 3,267 kg of VOCs.

Livermore Site restoration activities in 2016 were focused on enhancing and optimizing ongoing operations at treatment facilities. Evaluation of technologies that may accelerate cleanup of the Livermore Site contaminant source areas and address areas of co-mingled VOC and low-level tritium plumes, also continued. Beneath the site, groundwater concentration and hydraulic data indicate subtle but consistent declines in VOC concentrations and areal extent of contaminant plumes in 2016. Hydraulic containment along the western and southern boundaries of the site was fully maintained in 2016, and progress was made toward interior plume and source area clean up. See McKereghan et al. (2017) for more information.

Community Relations. Livermore Site community relations activities in 2016 included maintenance of information repositories and an administrative record; and disseminating environment-related news releases and internal/external newsletter articles, and responding to journalists' inquiries regarding the Livermore Site environmental cleanup; sending 391 letters to near neighbors living to the west of LLNL providing an update on the progress of the offsite groundwater plume cleanup; and a meeting with members of Tri-Valley Communities Against a Radioactive Environment (Tri-Valley CAREs) and the organization's scientific advisor as part of the activities funded by an EPA Technical Assistance Grant (TAG) (June 2016). DOE/LLNL also conducted tours of environmental restoration activities and facilities upon request. In addition, DOE/LLNL environmental documents, letters, and public notices were posted on a public website: <http://www-envirinfo.llnl.gov>.

2.1.1.2 Site 300 Environmental Restoration Project

Remedial activities are ongoing at Site 300, which became a CERCLA site in 1990 when it was placed on the National Priorities List. Remedial activities are overseen by the EPA, the Central Valley Regional Water Quality Control Board (CVRWQCB), and DTSC, under the authority of an FFA for the site. Contaminants of concern at Site 300 include VOCs (primarily TCE), high-explosive compounds, tritium, depleted uranium, silicone-based oils, nitrate, perchlorate,

polychlorinated biphenyls, dioxins, furans, and metals. The contaminants present in environmental media vary within the different environmental restoration operable units (OUs) at the site. See Webster-Scholten (1994) and Ferry et al. (1998) for background information on LLNL environmental characterization and restoration activities at Site 300. The *LLNL Site 300 2016 Annual Compliance Monitoring Report* (Buscheck et al. 2017) presents the current status of clean up at Site 300.

Regulatory Milestones. The Site 300 environmental restoration project had three milestones scheduled for completion in calendar year 2016. The following deliverables were submitted to the regulatory agencies:

- Annual 2015 Compliance Monitoring Report
- Draft Final First Five-Year Review Report for the Building 850/Pit 7 Complex Operable Unit
- Draft and Draft Final Five-Year Review Report for the Building 832 Canyon Operable Unit
- Draft Five-Year Review Report for the General Services Area Operable Unit
- Draft Five-Year Review Report for the Building 834 Operable Unit
- First Semester 2016 Compliance Monitoring Report

The following non-milestone deliverables were submitted to the regulatory agencies during 2016 including:

- Final Technical Memorandum for Characterization of Subsurface Soil in the Eastern General Services Area (GSA) Debris Burial Trenches
- Final Phase 2 Pilot Study Work Plan for Enhanced *In Situ* Bioremediation at Building 834
- Draft and Final Work Plan for Characterization of Background Concentrations of Metals and Uranium, Thorium, and Radium Isotopes in Surface and Subsurface Soil
- Draft and Final Work Plan for Characterization of Surface Soil in the Building 851 Firing Table Area
- Work Plans for Well Drilling at Site 300 in Fiscal Year 2016

All calendar-year 2016 milestones were met or renegotiated with the regulatory agencies.

With regulatory concurrence, the submittal dates for several deliverable documents were delayed and put on-hold as follows:

- The deliverable date for the Draft Final and Final Building 865 Remedial Investigation/Feasibility Study (RI/FS) was delayed and put on-hold as a result of a regulatory request for additional characterization of semi-volatile organic compounds (SVOCs) and VOCs in several areas at Building 865.
- The deliverable date for the Final Eastern GSA Final Close-out Report was delayed as a result of a regulatory request for additional characterization of polychlorinated biphenyls, SVOCs, and polycyclic aromatic hydrocarbons in subsurface soil in the Eastern GSA debris burial trench area and preparation of a Technical Memorandum summarizing the characterization results.

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- The deliverable date for the Building 850 Ground Water Perchlorate Focused Feasibility Study was delayed and put on-hold as a result of a regulatory request for additional characterization of perchlorate in subsurface soil at the Building 850 Firing Table and due to conflicts with multiple other regulatory documents.

Treatment Facilities. During 2016, the Site 300 Environmental Restoration Project (ERP) operated 15 groundwater and 5 soil vapor treatment facilities at Site 300. The groundwater extraction wells and dual-phase extraction wells extracted about 39.0 million L of groundwater during 2016. The dual-phase extraction wells and soil-vapor extraction wells together removed 2.3 million m³ of soil vapor.

In 2016, the Site 300 treatment facilities removed nearly 7 kg of VOCs, 0.066 kg of perchlorate, 1,100 kg of nitrate, 0.09 kg of the high explosive compound RDX, 0.0016 kg of silicone oils and 0.0032 kg of uranium. Since groundwater remediation began in 1990, approximately 1,679 million L of groundwater and 28 million m³ soil vapor have been treated, resulting in removal of more than 610 kg of VOCs, 1.6 kg of perchlorate, 17,000 kg of nitrate, 2.2 kg of RDX, 9.5 kg of silicone oils, and 0.028 kg of uranium.

Site 300 restoration activities in 2016 were focused on enhancing and optimizing ongoing operations at treatment facilities, continuing bioremediation treatability studies, and characterization in the Building 812 OU. Groundwater concentration data indicate declines in contaminant concentrations in 2016 and progress toward off-site and on-site plume and source area cleanup. See Buscheck et al. (2017) for more information.

Community Relations. Site 300 community relations activities in 2016 included maintenance of information repositories and an administrative record, two meetings (January and June 2016) with members of Tri-Valley CAREs and the organization's scientific advisor as part of the activities funded by an EPA TAG, and tours of site environmental activities. In addition, DOE/LLNL environmental documents, letters, and public notices were posted on a public website: <http://www-envirinfo.llnl.gov>.

2.1.2 Emergency Planning and Community Right-to-Know Act and Toxics Release Inventory Report

Title III of SARA, known as the Emergency Planning and Community Right-to-Know Act (EPCRA), requires owners and operators of facilities who handle certain hazardous chemicals on site to provide information on the release, storage, and use of these chemicals to organizations responsible for emergency response planning. Executive Order 13693, Planning for Federal Sustainability in the Next Decade, directs all federal agencies to comply with the requirements of the EPCRA, including SARA, Section 313, the Toxic Release Inventory (TRI) Program. EPCRA requirements and LLNL compliance are summarized in **Table 2-1**.

LLNL has reported lead release data via the Form R for Site 300 since 2002. The Form R is used for reporting TRI chemical releases and includes information about waste management and waste minimization activities. Over 99 percent of lead releases are associated with activities at the Site 300 Small Firearms Training Facility (SFTF). Data for the 2015 TRI Form R for lead at

Site 300 was submitted to DOE/NNSA on June 6, 2016. Over the past several years, the lead releases have decreased due to increased use of frangible bullets.

Table 2-1. Compliance with EPCRA.

EPCRA section	Brief description of requirement	LLNL action
302	Notify SERC of presence of extremely hazardous substances.	Originally submitted 05/87.
303	Designate a facility representative to serve as emergency response coordinator.	Update submitted 04/23/15 to San Joaquin County for Site 300 and 04/14/15 to the LPPD for Livermore Site.
304	Report releases of certain hazardous substances to SERC and LEPC.	No EPCRA-listed extremely hazardous substances were released above reportable quantities in 2016.
311	Submit SDSs or chemical list to SERC, LEPC, and Fire Department.	Per the California Office of Emergency Services, the EPCRA Section 311 requirement is satisfied by the EPCRA Section 312 submittal and the filing of necessary amendments within 30 days of handling a previously undisclosed hazardous material subject to Section 312 inventory requirements.
312	Submit hazardous chemical inventory to local administering agency (county).	Submitted to San Joaquin County and the LPPD on 01/11/16 and 02/26/16, respectively.
313	Submit Form R to U.S. EPA and California EPA for toxic chemicals released above threshold levels.	Form R for lead for Site 300 submitted to DOE on 05/24/16; DOE forwarded it to U.S. EPA and California EPA on 06/06/16.

Note: See the **Acronyms and Glossary** section for acronym definitions.

2.1.3 California Accidental Release Prevention Program

The California Accidental Release Prevention (CalARP) Program is the combined federal and state program for the prevention of accidental release of regulated toxic and flammable substances. The goal of the combined program is to eliminate the need for two separate and distinct chemical risk management programs. The purpose of the CalARP program is to prevent accidental releases of substances that can cause serious harm to the public and the environment, to minimize the damage if releases do occur, and to satisfy Community Right-to-Know laws. The CalARP program is implemented at the local government level by Certified Unified Program Agencies (CUPAs). The related federal regulations are the Clean Air Act (CAA) Section 112(r) and Title 40, Code of Federal Regulations, Part 68 (40 CFR Part 68).

LLNL submitted a revised Livermore Site CalARP Level 1 risk management plan (RMP) in September 2016. The Livermore Site RMP includes lithium hydride, hydrofluoric acid, and nitric acid.

2.1.4 Resource Conservation and Recovery Act

The Resource Conservation and Recovery Act (RCRA) provides the framework at the federal level for regulating solid wastes, including wastes designated as hazardous. The California Hazardous Waste Control Law (HWCL) and California Code of Regulations (CCR) Title 22 set requirements for managing hazardous wastes and implementing RCRA in California. LLNL

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works with DTSC and CUPA to comply with these regulations and obtain hazardous waste permits.

The hazardous waste management facilities at the Livermore Site consist of permitted units in Area 612 and Building 625 plus Buildings 693, 695, and 696, which make up the Decontamination and Waste Treatment Facility (DWTF). Permitted waste-management units include container storage, tank storage, and various treatment processes (e.g., wastewater filtration, blending, and size reduction). LLNL submitted the permit renewal application to DTSC in April 2009, followed by submittal of the human health risk assessment (HHRA) in December 2010 as part of the permit renewal process. DTSC issued the Hazardous Waste Facility Permit on March 11, 2016. However, DTSC stayed the permit on April 29, 2016 to address three comments that were accepted on December 1, 2016. Resolution of the three appeal comments are currently in the DTSC appeal process as of December 31, 2016.

The hazardous waste management facilities at Site 300 consist of three operational RCRA-permitted facilities. The Explosives Waste Storage Facility (EWSF) and the Explosives Waste Treatment Facility (EWTF) are permitted to store and treat explosives waste, respectively. The Building 883 container storage area (CSA) is permitted to store routine facility-generated hazardous waste such as spent acids, bases, contaminated oil, and spent solvents. Site 300 has one post-closure permit for the RCRA-closed Building 829 High Explosives Burn Pits. LLNL is currently in the process of renewing the hazardous waste facility permit for EWSF, EWTF, and Building 883 CSA, as well as the Building 829 post-closure permit. Transportation of hazardous or mixed waste over public roads occurs by DTSC-registered transporters, including LLNL.

2.1.5 California Medical Waste Management Act

All LLNL medical waste management operations are conducted in accordance with the California Medical Waste Management Act (MWMA). The program is administered by the California Department of Public Health (CDPH) and is enforced by the Alameda County Department of Environmental Health (ACDEH). LLNL's medical waste permit is renewed on an annual basis and covers medical waste generation and treatment activities for the Biosafety Level (BSL) 2 facilities, and one BSL 3 facility at Building 368. LLNL revised the BSL 2 and 3 Medical Waste Management Plans to incorporate new requirements pursuant to California Assembly Bill (AB) 333, which became effective in January 2016. The BSL 2 and 3 Medical Waste Management Plans and Emergency Action Plans were submitted to the Alameda County Department Health in June 2016.

2.1.6 Radioactive Waste and Mixed Waste Management

LLNL manages radioactive waste and mixed waste in compliance with applicable sections of DOE Order 435.1, DOE Manual 435.1-1, DOE Notice 435.1, and the LLNL-developed Radioactive Waste Management Basis for the Lawrence Livermore National Laboratory (LLNL 2012), which summarizes radioactive waste management controls relating to waste generators and treatment and storage facilities.

2.1.7 Release of Property

LLNL does not release property (e.g., vehicles, equipment, or other materials) to the public with residual radioactivity above the limits specified in DOE Order 458.1. Pursuant to written procedures, items that are potentially contaminated or activated are either surveyed prior to the release to the public, or a process knowledge evaluation is conducted to verify that the material has not been exposed to radioactive material or to energy capable of inducing radioactivity in the material. In some cases, both a radiological survey and a process knowledge evaluation are performed. Excessed items that meet the requirements for unrestricted-release are donated to interested state agencies, federal agencies, or universities; redeployed to other on-site users; or released to LLNL's Donation, Utilization and Sales group. In 2016, approximately 1,400 equipment release swipes were processed by LLNL's Radiological Measurements Laboratory; the equipment may have subsequently been used onsite or released to the public. Utilizing a graded approach, LLNL only keeps track of high value released items (e.g., those items worth greater than \$100,000). In 2016, the only high-value item released was ~7.5 kg of platinum; this material was released back to the DOE precious metal system.

DOE issued a moratorium in January 2000 prohibiting the release of volume-contaminated metals and subsequently suspended the release of metals for recycling purposes from DOE radiological areas in July 2000. No metals subject to the moratorium or suspension were released from LLNL in 2016.

Excess property with residual radioactivity above the limits in DOE Order 458.1 is either transferred to other DOE facilities for reuse, or transferred to LLNL's Radioactive and Hazardous Waste Management for disposal as radioactive waste. There were no releases of real property to the public in 2016.

2.1.8 Federal Facility Compliance Act

LLNL continues to work with DOE to maintain compliance with the Federal Facilities Compliance Act (FFCA) Site Treatment Plan (STP) for LLNL, which was signed in February 1997. LLNL completed 7 milestones during 2016. An additional 36.5 m³ of newly generated mixed waste was accepted into the approved storage facilities and added to the STP. LLNL removed approximately 12.7 m³ of mixed waste from LLNL in 2016.

Reports and certification letters were submitted to DOE as required. LLNL continued the use of available commercial treatment and disposal facilities that are permitted to accept LLNL mixed waste. These facilities provide LLNL greater flexibility in pursuing the goals and milestones set forth in the STP.

2.1.9 Toxic Substances Control Act

The Federal Toxic Substances Control Act (TSCA) and implementing regulations found in 40 CFR Parts 700–789 govern the uses of newly developed chemical substances and TSCA-governed waste. In 2016, eight containers of TSCA-regulated PCB waste with an aggregate

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weight of 149 kilograms were transported to and disposed at the RCRA-permitted, Clean Harbors Treatment, Storage, and Disposal Facility (TSDF) in Aragonite, Utah.

2.2 Air Quality and Protection

2.2.1 Clean Air Act

All activities at LLNL are evaluated to determine the need for air permits or equipment registrations. Air permits are obtained from the Bay Area Air Quality Management District (BAAQMD) for the Livermore Site and from the San Joaquin Valley Air Pollution Control District (SJVAPCD) and/or BAAQMD for Site 300. The BAAQMD also administers a boiler registration program for natural gas fueled boilers with rated heat input capacities greater than 2 million British Thermal Units per hour (BTU/hr.) and less than 10 million BTU/hr.

Both the BAAQMD and the SJVAPCD are overseen by the California Air Resources Board (CARB). CARB also oversees the statewide permitting for portable diesel fuel-driven equipment such as portable generators and portable air compressors. In addition, CARB presides over the state-wide registration of in-use off-road diesel vehicles, such as diesel-powered forklifts, loaders, backhoes, graders, and cranes.

In 2016, LLNL operated 135 permitted air-pollutant emission sources at the Livermore Site and 35 permitted air-pollutant emission sources at Site 300. In addition, LLNL maintained the registrations for 36 natural gas boilers (and its commitments to replace boilers) with the BAAQMD at the Livermore Site and continued the registrations for 81 in-use off-road diesel vehicles with CARB at the Livermore Site and Site 300.

In 2016, LLNL continued to maintain a Synthetic Minor Operating Permit (SMOP) with the BAAQMD to ensure that facility-wide actual emissions of regulated air pollutants from the Livermore Site did not exceed federal CAA Title V emission limits. The source categories covered under the SMOP include solvents, fuel dispensing, remediation and wastewater, and combustion. LLNL was initially issued the SMOP by the BAAQMD in 2002 after it was determined that LLNL had the potential to emit regulated air pollutants in excess of federal CAA Title V emission limits, if all emission sources at the Livermore Site were to operate at maximum capacity. As a result, LLNL agreed to receive federally enforceable permit conditions in the SMOP that reflect actual emissions of regulated air pollutants from sources rather than potential emissions from sources. As such, LLNL has been able to demonstrate through extensive monitoring and record keeping practices of emissions for sources, and meeting significantly reduced air pollutant emissions limits in the SMOP that its actual emissions are well below CAA Title V emission limits, and thus, LLNL does not have any “major sources” of air pollutant emissions per 40 CFR 70.2.

On July 15, 2016, Site 300 was reclassified by SJVAPCD from a Title V Major Facility to a Minor Facility with potential to emit (PTE) of less than 10 tons per year for VOCs. As a Minor Facility, Site 300 is not mandated to tally the rolling 12-month emission as previously required by

SJVAPCD. In addition, Site 300 is no longer subject to annual compliance inspections but would fall under a biennial schedule.

Under the authority of AB 32, the State of California adopted several regulations regarding emissions of greenhouse gases. California's Mandatory Reporting of Greenhouse Gas Emissions Regulation initially (for calendar years 2008-2011) required certain facilities to annually report greenhouse gas emissions from natural gas combustion when annual emissions exceeded 25,000 metric tons of CO₂ equivalent. The regulation was amended and the reporting threshold was lowered to 10,000 metric tons per year of CO₂ equivalent beginning with calendar year 2012. Since 2008, the Livermore Site's annual greenhouse gas emissions from natural gas combustion have been slightly below 25,000 metric tons CO₂ equivalent. LLNL began reporting the Livermore Site's greenhouse gas emissions from natural gas combustion for calendar year 2012 and has reported each year since.

In addition, LLNL continues to implement reductions and controls to minimize CO₂ emissions. LLNL is replacing diesel engines, boilers and hot water heaters on a continuing basis, and the new equipment is more efficient than the replaced equipment, in terms of fuel use and air emissions, such as CO₂. Site 300 emissions of CO₂ are much lower than Livermore Site emissions, and there is no natural gas service at Site 300 that would generate CO₂ emissions.

Also under the authority of AB 32, California has adopted regulations pertaining to sulfur hexafluoride (SF₆), because of its high global warming potential. LLNL was required to submit an annual report to CARB describing the research uses of SF₆ and the measures taken to control the SF₆ emissions from such research activities, and was required to keep records on the amounts of SF₆ contained in and used for electrical switchgear during calendar year 2016. The reduction of greenhouse gases has been further encouraged by Executive Order 13693, which establishes an integrated strategy toward sustainability in the federal government and to make reduction of greenhouse gas emissions a priority for federal agencies.

In addition, the EPA has a mandatory reporting regulation for stationary emission sources, similar to California's regulation. LLNL is currently below the mandatory reporting threshold for the EPA of 25,000 metric tons per year at both the Livermore Site and Site 300.

2.2.2 National Emission Standards for Hazardous Air Pollutants, Radionuclides

To demonstrate compliance with 40 CFR Part 61, Subpart H (National Emission Standards for Hazardous Air Pollutants [NESHAPs] for radiological emissions from DOE facilities), LLNL monitors certain air-release points and evaluates the maximum potential dose to the public. The *LLNL NESHAPs 2016 Annual Report* (Wilson et al. 2017) reported that the estimated maximum radiological dose from radioactive air emissions were $2.8 \times 10^{-2} \mu\text{Sv}$ (2.8×10^{-3} mrem) for the Livermore Site and $2.2 \times 10^{-3} \mu\text{Sv}$ (2.2×10^{-4} mrem) for Site 300. The totals are well below the 100 $\mu\text{Sv/y}$ (10 mrem/y) site-wide dose limits defined by the NESHAPs regulation. The *LLNL NESHAPs 2016 Annual Report* is in Appendix D of this report.

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2.3 Water Quality and Protection

LLNL complies with requirements of the Federal Clean Water Act (CWA), Porter-Cologne Water Quality Control Act, Safe Drinking Water Act (SDWA), the California Aboveground Petroleum Storage Act, Water Code, Health and Safety Code, and City of Livermore ordinances by complying with regulations and obtaining permits issued by the appropriate regulatory agencies whose mission is to protect water quality.

LLNL complies with the requirements of National Pollutant Discharge Elimination System (NPDES) and Waste Discharge Requirement (WDR) permits, and Water Quality Certifications issued by Regional Water Quality Control Boards (RWQCBs) and the State Water Resources Control Board (SWRCB) for discharges to waters of the U.S. and waters of the state. Discharges to the City of Livermore's sanitary sewer system are governed by permits issued by the Water Resources Division (WRD). The SDWA requires that LLNL register Class V injection wells with the EPA, and LLNL obtains permits from the Army Corps of Engineers (ACOE) for work in wetlands and waters of the U.S.

The CWA and California Aboveground Petroleum Storage Act require LLNL to have and implement Spill Prevention Control and Countermeasure (SPCC) plans for aboveground, oil-containing containers. The Livermore Pleasanton Fire Department (LPFD) and the San Joaquin County Environmental Health Department (SJCEHD) also issue permits for operating underground storage tanks (USTs) containing hazardous materials or hazardous waste (see **Table 2-2**). LLNL's USTs, for which permits are required, contain diesel fuel or gasoline; aboveground storage tanks, for which permits are not required, contain fuel, insulating oil, and process wastewater.

2.4 Other Environmental Statutes

2.4.1 National Environmental Policy Act and Floodplains and Wetland Assessments

The National Environmental Policy Act (NEPA) of 1969 is the U.S. government's basic environmental charter. When considering a proposed project or action at LLNL, DOE/NNSA must (1) consider how the action would affect the environment and (2) make certain that environmental information is available to public officials and citizens before decisions are made and actions are taken. The results of the evaluations and notice requirements are met through publication of "NEPA documents," such as environmental impact statements (EISs) and environmental assessments (EAs) under DOE NEPA Implementing Procedures in 10 CFR 1021.

In 2005, DOE/NNSA completed the Final Site-Wide Environmental Impact Statement for Continued Operation of Lawrence Livermore National Laboratory and Supplemental Stockpile Stewardship and Management Programmatic Environmental Impact Statement (2005 SWEIS) (U.S. DOE/NNSA 2005). In 2011, DOE/NNSA prepared a Supplement Analysis (SA) (DOE/EIS-0348-SA-03) of the 2005 SWEIS to consider whether the 2005 SWEIS should be supplemented, a new EIS should be prepared, or no further NEPA documentation is required

(U.S. DOE/NNSA 2011). The SA concluded that a supplement to the 2005 SWEIS or a new SWEIS was not needed. Both the 2011 SA and the 2005 SWEIS are available on the web at <http://www-envirinfo.llnl.gov>.

In 2016, no other EISs or EAs were completed. Several Categorical Exclusions under DOE NEPA Regulations (10 CFR 1021) were completed as follows:

- LLNL Livermore Site HVAC Modernization (NA-16-01)
- Construction and Operations of B276, Security Fitness and Training Center Replacement Facility (NA-16-02)
- Cellular Phone Service at Site 300 (NA-16-03)

There were no proposed actions at LLNL that required separate DOE floodplain or wetlands assessments under DOE regulations in 10 CFR Part 1022.

2.4.2 National Historic Preservation Act

The National Historic Preservation Act (NHPA) provides protection and preservation of historic properties that are significant in the nation's history. LLNL resources subject to NHPA consideration range from prehistoric archeological sites to remnants of LLNL's own history of scientific and technological endeavors. The responsibility to comply with the provisions of the NHPA rests with DOE/NNSA as the lead federal agency in this undertaking. LLNL supports the agency's NHPA responsibilities with direction from DOE/NNSA.

In 2005, in consultation with DOE/NNSA, the California State Historic Preservation Officer (SHPO) formally determined that five archaeological resources, five individual buildings, two historic districts (encompassing 13 non-contiguous individual buildings), and selected objects in another building at LLNL are eligible for listing in the National Register of Historic Places (NRHP). In 2016, DOE continued consultation with SHPO and the Advisory Council on Historic Presentation (ACHP) to (1) remove specific equipment and upgrade the B851 facility, and (2) perform the final decommissioning and demolition of B850. In each case, as final mitigation for loss of integrity of the facility for the period of historic significance, DOE and LLNL prepared Historic American Engineering Report (HAER) documentation. Consultation on these actions has not been completed.

2.4.3 Antiquities Act of 1906

The Antiquities Act provides for protection of items of antiquities (i.e., archaeological sites and paleontological remains). The five NRHP-eligible archaeological sites noted in Section 2.4.2 are protected under the Antiquities Act. No paleontological remains subject to the provisions of the Antiquities Act were identified in 2016.

2.4.4 Endangered Species Act and Sensitive Natural Resources

LLNL meets the requirements of the Federal and State Endangered Species Acts (ESAs), the Eagle Protection Act, the Migratory Bird Treaty Act, and other applicable regulations as they

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pertain to endangered species, threatened species, and other special-status species (including their habitats) and designated critical habitats that exist at the LLNL sites.

2.4.5 Federal Insecticide, Fungicide, and Rodenticide Act

LLNL complies with the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA), which provides federal control of the distribution, sale, and use of pesticides and requires that commercial users of pesticides are certified pesticide applicators. The California Department of Pesticide Regulation (DPR) has enforcement responsibility for FIFRA in California; DPR has in turn given enforcement responsibility to county departments of agriculture. All pesticides at LLNL are applied, stored, and used in compliance with FIFRA and other California, Alameda County, and San Joaquin County regulations governing the use of pesticides. The staff of the Landscape and Pest Management Shop at the Livermore Site and the Laborer/Gardener Shop at Site 300 includes certified pesticide applicators. These shops ensure that all storage and use of pesticides at LLNL is in accordance with applicable regulations. LLNL also reviews pesticide applications to ensure they do not result in impacts to water quality or special status species.

2.5 Environmental Permits, Inspections, and Occurrences

LLNL's various missions require a variety of permits. **Table 2-2** is a summary of active permits in 2016 at the Livermore Site and Site 300. The external agencies that issue the permits may also perform inspections required by the permits. **Table 2-3** lists environmental inspections and findings from both LLNL sites in 2016.

Notification of environmental occurrences is required under a number of environmental laws and regulations as well as DOE Order 232.2 (Occurrence Reporting and Processing of Operations Information). **Table 2-4** provides a list of environmental incidents reportable under DOE Order 232.2.

Table 2-2. Active permits in 2016 at the Livermore Site and Site 300.

Type of permit	Livermore Site ^(a)	Site 300 ^(a)
Hazardous waste	<p>EPA ID No. CA2890012584. Hazardous Waste Facility Permit Number 99-NC-006 (RCRA Part B permit)—to operate hazardous waste management facilities. Agency – DTSC.</p> <p>Registered Hazardous Waste Hauler authorized to transport wastes from Site 300 to the Livermore Site. Permit number 1351. Agency – DTSC.</p> <p>LPCD Facility I.D. # 10697. Hazardous Waste Generator Program, On-site treatment of hazardous waste (tiered permitting) program: Conditionally Exempt Specified Wastestream, CE231-1, Hazardous Materials Business Program, Above Ground Petroleum Tank Program, CA Accidental Release Program, and Underground Storage Tank Program. Payment for USTs September 20, 2013–September 19, 2018, permit #092013-10697. Agency – LPCD CUPA.</p>	<p>EPA ID No. CA2890090002. Hazardous Waste Facility Permit—CSA (Building 883), EWTF and EWSF. Agency – DTSC.</p> <p>Hazardous Waste Facility Post-Closure Permit No. 02-BRK-04—Closed Building 829 High Explosives Open Burn Treatment Facility. Agency – DTSC.</p> <p>Facility I.D. # FA0003934 RCRA Hazardous Waste Generator category: waste generation in an amount equal to or more than 50 tons, but less than 250 tons. Agency – SJCEHD CUPA.</p>
Medical waste	<p>ACDEH issued a permit (PT0200461/PT0305526) that covers medical waste generation and treatment activities for BSL 2 facilities at B132 North and South, B150 Complex, B360 Complex, B663, and the BSL 3 facility at Building 368.</p>	<p>Registered with SJCEHD as a Small Quantity Medical Waste Generator.</p>
Air	<p>BAAQMD issued 128 permits for operation of various types of equipment.</p> <p>BAAQMD issued a revision to the SMOP in 2015, which was initially issued in 2002 to ensure the NOx and HAPs emissions from the site do not exceed federal Clean Air Act Title V emission limits.</p> <p>BAAQMD issued 1 Asbestos Removal and Demolition Permit.</p> <p>CARB issued 7 permits for the operation of portable diesel air compressors and generators.</p>	<p>SJVAPCD issued 33 permits for operation of various types of equipment.</p> <p>SJVAPCD approved a Prescribed Burn Plan for the burning of 1,720.1 acres of grassland.</p> <p>BAAQMD issued 1 permit for the operation of an emergency diesel generator.</p> <p>CARB issued 1 permit for the operation of portable diesel air compressor.</p> <p>BAAQMD approved a Prescribed Burn Plan for the burning of 139.1 acres of grassland.</p>
Underground Storage tanks	<p>One operating permit (092813-10697) issued by LPCD covering operation of 9 USTs from September 20, 2013–September 19, 2018.</p>	<p>One operating permit covering 3 underground petroleum storage tanks assigned individual permit numbers (PT0006785 [879TFUD01], PT0006530 [882TFUD01], and PT0007967 [879TFUG01]).</p>
Sanitary sewer	<p>Discharge Permit 1250^(b) for discharges of wastewater to the sanitary sewer.</p> <p>Permit 1510G for discharges of groundwater from CERCLA restoration activities.</p>	<p>WDR R5-2008-0148 for operation of sewage evaporation pond.</p>

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Table 2-2. (cont.) Active permits in 2016 at the Livermore Site and Site 300.

Type of permit	Livermore Site ^(a)	Site 300 ^(a)
Water	<p>WDR No. 88-075 for discharges of treated groundwater from Treatment Facility A to recharge basin.^(c)</p> <p>NPDES General Permit 2014-0057-DWQ (Waste Discharge Identification Number [WDID] 2 01I025682) for discharge of storm water associated with industrial activities.</p> <p>NPDES General Permit 2009-009-DWQ for discharges of storm water associated with construction activities affecting 0.4 hectares (1 acre) or more.</p> <p>FFA for groundwater investigation/remediation.</p>	<p>WDR No. 93-100 for post-closure monitoring requirements for two Class I landfills.</p> <p>WDR R5-2008-0148 for discharges to percolation pits and septic systems.</p> <p>NPDES General Permit 2014-0057-DWQ (WDID 5S39I021179) for discharge of storm water associated with industrial activities.</p> <p>NPDES Regional General Permit R5-2013-0074-025 for large volume discharges from the drinking water system.</p> <p>Domestic Water Supply Permit No. 01-10-16PA-003</p> <p>FFA for groundwater investigation/remediation.</p> <p>32 registered Class V injection wells.</p>

Note: See the **Acronyms and Glossary** section for acronym definitions.

^(a) Numbers of permits are based on actual permitted units or activities maintained and/or renewed by LLNL during 2016.

^(b) Permit 1250 includes some wastewater generated at Site 300 and discharged at the Livermore Site.

^(c) Recharge basin referenced in WDR Order No. 88-075 is located south of East Avenue within Sandia National Laboratories/California boundaries. The discharge no longer occurs; however, the agency has not rescinded the permit.

Table 2-3. Inspections of Livermore Site and Site 300 by external agencies in 2016.

Medium	Description	Agency	Date	Finding
Air	Air pollutant emission sources (Livermore Site)	BAAQMD	02/25/16	No violations
			05/26/16	No violations
			06/23/16	No violations
			07/27/16	No violations
			10/04/16	Notice of violation issued for failure to meet permit conditions
			11/17/16	
Synthetic Minor Operating Permit (SMOP) (Livermore Site)	BAAQMD	09/22/16	No violations	
		Air pollutant emission sources (Site 300)	SJVAPCD	10/25/16
Hazardous Materials Business Plan	CUPA Inspection (Livermore Site)	LFPD	07/25/16 – 08/28/16	No violations
	CUPA Inspection (Site 300)	SJCEHD	NA	No inspections in 2016
Pesticides	Pest control records inspections (Livermore Site)	ACCDA	12/20/16	No violations
Sanitary sewer	Annual Inspection of the Sewer Monitoring Complex, Livermore Site	WRD	10/03/16	No violations
	Categorical sampling/inspection Buildings 153 and 321C. (Livermore Site)	WRD	05/11/16	No violations
			10/04/16	No violations
	Annual compliance sampling at the Sewer Monitoring Complex (Livermore Site)	WRD	10/04/16	No violations
	Café grease interceptor inspections, Buildings 123 and 471 (Livermore Site)	WRD	10/04/16	No violations
Quarterly BOD/total suspended solids (TSS) sampling at Outfall (Livermore Site)	WRD	02/03/16	No violations	
		05/10/16	No violations	
		07/27/16	No violations	
		10/07/16	No violations	

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Table 2-3. (cont.) Inspections of Livermore Site and Site 300 by external agencies in 2016.

Medium	Description	Agency	Date	Finding
Storage tanks	Compliance with underground storage tank requirements and operating permits (Livermore Site)	LPFD	07/22/16 08/17/16	No violations
	Compliance with underground storage tank requirements and operating permits (Site 300)	SJCEHD	08/03/16	SJCEHD issued five violations for: Failed to have an approved UST monitoring plan (corrected onsite, violation rescinded), current monitoring plan approved by the SJCEHD not found on site (corrected onsite, violation rescinded), operator failed to document alarms (corrected onsite), dispenser alarm failed to alarm (corrected onsite), and failed spill bucket leak test.
	UST spill bucket repair inspection	SJCEHD	10/05/16	SJCEHD issued a violation for a sensor not placed to indicate a leak at the earliest opportunity (corrected onsite).
	Compliance with aboveground storage tank requirements (SPCC/APSA, Livermore Site)	LPFD	07/25/16 – 07/28/16	No violations
	391-D1A1 Tank Closure 412-D1A1 Tank Closure	LPFD	4/12/16 8/23/16	No violations No violations
Waste	CUPA Inspection (Livermore Site)	LPFD	07/25/16 -07/28/16	One violation was issued for two small containers accumulating hazardous waste without properly completed hazardous waste labels attached. Properly completed hazardous waste labels were immediately attached to the containers.
	CUPA Inspection, Site 300	SJCEHD	10/31/16 - 11/2/16	SJCEHD issued 8 violations for: Failure to determine if a waste is a hazardous waste, failure to retain hazardous waste determination including waste analysis on site for 3 years, failure to maintain complete training records, failure to provide information regarding recyclable material claimed under exclusion or exemption, failure to keep hazardous waste container closed, storage of hazardous waste for greater than 90 days, failure to completely label hazardous waste container, and failure to properly manage universal waste electronic devices. Occurrence Reporting details for these 8 violations will be in table 2-4 of the 2017 SAER.
	Hazardous waste facilities Compliance Evaluation Inspection (CEI) (Site 200)	EPA	09/1/16 – 09/2/16	One noncompliance issue was identified. Peeling epoxy coating was observed within a tank trailer storage unit (a secondary containment system). This noncompliance issue has since been corrected. The loose paint was scraped off, the surface of the storage unit was cleaned with a brush and the surface was repainted with new epoxy based paint.
	Hazardous waste facilities Compliance Evaluation Inspection (CEI) (Site 300)	EPA/DTSC	NA	No inspections in 2016
	Medical Waste facilities inspection	ACDEH	08/17/16	No violations
Water	Permitted operations (Site 300)	CVRWQCB	NA	No Inspections in 2016

Note: See the **Acronyms and Glossary** section for acronym definitions.

Table 2-4. Environmental Occurrences reported under the Occurrence Reporting System in 2016.

Date ^(a)	Occurrence category/group	Description
07/28/16	Significance Category SC4 Occurrence under Group 9(1) OR 2016-0021	On July 28, 2016, the Environmental Functional Area (EFA) of LLNL received a Notice of Violation from the LPFD as a result of a CUPA Inspection. The inspection report included one violation. LPFD observed two small containers accumulating hazardous waste without properly completed hazardous waste labels attached. Immediately upon discovery, a properly completed hazardous waste label was attached to each container. No further action was required.
08/24/16	Significance Category SC4 Occurrence under Group 9(1) OR 2016-0024	On August 24, 2016, LLNL received an Underground Storage Tank Program Inspection Report from the San Joaquin County Environmental Health Department which contained five violations with the operation/management of fuel tanks at Site 300. Four of the five violations were administrative in nature and were corrected on the spot, two of these were rescinded. The fifth violation was the determination that the spill bucket on the B879 diesel fuel tank was not capable of containing a spill or overflow. On October 5, 2016, there was a follow up inspection where an additional violation was found. This violation was corrected on the spot, and no additional ITS action was added.
09/01/16	Significance Category SC4 Occurrence under Group 5A(2) OR 2016-0027	On September 1, 2016, the LLNL Environmental Functional Area contacted the Central Valley Regional Water Quality Control Board to alert them of an issue with the Site 300 sewer ponds. It was reported that a problem with the outfall pipe allowed approximately 50-100 gallons of treated effluent to flow into the secondary pond (a percolation pit). Under the ponds' permit conditions, the secondary pond is only allowed to accept effluent during maintenance activities or from overflow resulting from heavy rain events.
10/06/16	Significance Category SC4 Occurrence under Group 9(1) OR 2016-0031	A precision optics cleaner permitted by the Bay Area Air Quality Management District (BAAQMD)(source S-2131), malfunctioned, causing increased toluene emissions above the permit limit. The permit limit exceedance was discovered on September 26, 2016 after transcription errors in the unit's usage log were identified. The records show that the source had exceeded its permit limit of 600 lbs. per 12-month rolling total. The permit limit exceedance was reported to the BAAQMD via telephone on the day it was discovered. The BAAQMD inspector visited LLNL on October 4, 2016 to review the operation. On October 6, 2016, a Notice of Violation (NOV) was issued under BAAQMD Reg 2 Rule 1 Sec 307, Failure to Meet Permit Condition, solvent limit exceeded (PC#15925-1).
11/28/16	Significance Category SC4 Occurrence under Group 9(1) OR 2016-0033	On November 28, 2016, WCI Management was made aware of a final inspection report received from the Environmental Protection Agency (EPA) Region 9 Enforcement Division from an unannounced compliance evaluation inspection performed at Site 200 on September 1 & 2, 2016. One noncompliance was identified in Area 625, peeling epoxy coating observed within a tank trailer storage unit, a secondary containment system. This noncompliance has since been corrected. The loose paint was scraped off, the surface of the storage unit was cleaned with a brush and the surface was repainted with new epoxy based paint.

Note: See the **Acronyms and Glossary** section for acronym definitions.

^(a) Date the occurrence was categorized not discovered.

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