

2. Compliance Summary

Lawrence Livermore National Laboratory (LLNL) activities comply with applicable 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 2020, 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 Groundwater Project

The Livermore Site came under CERCLA in 1987 when it was placed on the National Priorities List. The Livermore Site Groundwater 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 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 volatile organic compounds (VOCs), primarily trichloroethylene (TCE) and perchloroethylene (PCE). Background information on LLNL Livermore Site environmental characterization and restoration activities is presented in the *CERCLA Remedial Investigation Report for the LLNL Livermore Site* (Thorpe et al., 1990). The *LLNL Groundwater Project 2020 Annual Report* (Noyes et al., 2021) presents the current status of cleanup at the Livermore Site.

Regulatory Deliverables. In calendar year 2020, the following Livermore Site deliverables were submitted to the regulatory agencies:

- *The Livermore Site Fourth Quarter 2019 Self-Monitoring Report*
- *LLNL Groundwater Project 2019 Annual Report*

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- *First, Second, and Third Quarter 2020 Self-Monitoring Reports*
- Work plans for well and borehole drilling at the Livermore Site in Fiscal Year 2020
- *Quality Assurance Project Plan* revision

Treatment Facilities. During 2020, the Livermore GWP maintained 27 groundwater and 8 soil vapor treatment facilities. The groundwater extraction wells and dual extraction wells extracted about 814 million L of groundwater during 2020. The dual extraction wells and soil-vapor extraction wells together removed approximately 3.4 million m³ of soil vapor.

In 2020, the Livermore GWP treatment facilities removed about 34 kg of VOCs. Since remediation efforts began in 1989, more than 25.5 billion L of groundwater and approximately 32.6 million m³ of soil vapor have been treated, removing about 3,430 kg of VOCs.

Livermore Site restoration activities in 2020 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 2020. Hydraulic containment along the western and southern boundaries of the site was fully maintained in 2020, and progress was made toward interior plume and source area cleanup. See Noyes et al. (2021) for more information.

Community Relations. Livermore Site community relations activities in 2020 included maintaining information repositories and an administrative record; sending letters to near neighbors living to the west of LLNL providing an update on the progress of the off-site groundwater plume cleanup; and meeting with members of Tri-Valley Communities Against a Radioactive Environment (Tri-Valley CAREs) and the organization's scientific advisor. In addition, DOE/LLNL environmental documents, letters, and public notices were posted on a public website: <https://enviroinfo.llnl.gov/>. DOE/LLNL was unable to conduct CERCLA community tours of the Livermore Site during 2020 due to LLNL Minimum Safe Operations in response to the COVID-19 pandemic.

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 *Annual 2020 Compliance Monitoring Report* (Buscheck et al., 2021) presents the current status of cleanup at Site 300.

Regulatory Deliverables. In calendar year 2020, the following Site 300 deliverables were submitted to the regulatory agencies:

- *Annual 2019 Compliance Monitoring Report*
- *First Semester 2020 Compliance Monitoring Report*
- Work plans for well drilling at Site 300 in Fiscal Year 2020
- *Quality Assurance Project Plan* revision

All calendar year 2020 milestones were met or renegotiated with the regulatory agencies.

Treatment Facilities. During 2020, the Site 300 Environmental Restoration Project (ERP) operated 16 groundwater and 5 soil vapor treatment facilities at Site 300. The groundwater extraction wells and dual extraction wells extracted about 22.2 million L of groundwater during 2020. The dual extraction wells and soil-vapor extraction wells together removed 1.4 million m³ of soil vapor.

In 2020, the Site 300 treatment facilities removed approximately 4.2 kg of VOCs, 0.057 kg of perchlorate, 962 kg of nitrate, 0.092 kg of the high explosive compound RDX, and 0.003 kg of uranium. Since groundwater remediation began in 1990, approximately 1,786 million L of groundwater and 38 million m³ of soil vapor have been treated, resulting in removal of approximately 635 kg of VOCs, 1.9 kg of perchlorate, 22,000 kg of nitrate, 2.9 kg of RDX, 9.5 kg of silicone oils, and 0.1 kg of uranium.

Site 300 restoration activities in 2020 were focused on enhancing and optimizing ongoing operations at treatment facilities, continuing bioremediation treatability studies, and ongoing monitoring of groundwater remediation progress. Groundwater monitoring data indicate declines in contaminant concentrations in 2020 and progress toward off-site and on-site plume and source area cleanup. See Buscheck et al. (2021) for more information.

Community Relations. Site 300 community relations activities in 2020 included maintaining information repositories and an administrative record, and one meeting with members of Tri-Valley CAREs and the organization's scientific advisor. DOE/LLNL environmental documents, letters, and public notices were posted on a public website: <https://enviroinfo.llnl.gov/>. DOE/LLNL was unable to conduct CERCLA community tours of Site 300 during 2020 due to LLNL Minimum Safe Operations in response to the COVID-19 pandemic.

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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 13834, Efficient Federal Operations, 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 2019 TRI Form R for lead at Site 300 was submitted to DOE/National Nuclear Security Administration (NNSA) on April 28, 2020.

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.	Last update submitted 12/29/20 to San Joaquin County for Site 300 and 12/30/20 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 2020.
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 01/06/20 and 02/11/20, 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 06/10/20, DOE forwarded it to U.S. EPA and California EPA on 06/16/20.

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 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 was in the DTSC appeal process as of December 31, 2020.

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. DTSC issued the Hazardous Waste Facility Permit (HWFP) for EWSF, EWTF and the CSA on June 29, 2017. The HWFP is effective for 10 years, from August 7, 2017–August 7, 2027. DTSC issued the Building 829 post-closure permit on April 28, 2017. The post-closure permit is effective for 10 years, from April 27, 2017–April 27, 2027. 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) at the Livermore Site, and San Joaquin County Environmental Health Department (SJCEHD) at Site 300. LLNL's medical waste permits are renewed on an annual basis and cover medical waste generation and treatment activities for the Biosafety Level (BSL) 2 facilities, and one BSL 3 facility. LLNL revised the BSL 2 and 3 Medical Waste Management Plans to incorporate new requirements pursuant to California Assembly Bill (AB)

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333, which became effective in January 2016. The BSL 2 and 3 Medical Waste Management Plans and Emergency Action Plans were most recently submitted to the ACDEH in August 2020.

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 2019), 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 2020, approximately 2,935 equipment release swipes were processed by LLNL's Radiological Measurements Laboratory; the equipment may have subsequently been used on-site 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 2020, no high value items were released.

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 2020.

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.

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 2020. An additional 43.5 m³ of newly generated mixed waste was accepted into the approved storage facilities and added to the STP. LLNL removed approximately 74.6 m³ of mixed waste from LLNL in 2020.

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 2020, 13 containers of TSCA-regulated polychlorinated biphenyl (PCB) waste with an aggregate weight of 1,109 kilograms were transported to and disposed at RCRA-permitted, Clean Harbors Treatment, Storage, and Disposal Facilities in Aragonite, Utah and Buttonwillow, California.

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), which 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 (e.g., diesel-powered forklifts, loaders, backhoes, graders, and cranes), on-road heavy-duty diesel vehicles with a gross vehicle weight rating > 14,000 pounds (e.g., garbage trucks, street sweepers, and bucket trucks) and large spark-ignition (LSI) engine vehicles (e.g., gasoline, propane and electric forklifts, scrubbers/sweepers, and industrial tow tractors).

In 2020, LLNL operated 111 permitted air-pollutant emission sources at the Livermore Site and 36 permitted air-pollutant emission sources at Site 300. In addition, LLNL maintained the registrations for 36 natural gas-fired boilers with the BAAQMD at the Livermore Site. LLNL also maintained registrations for 10 portable diesel engines powering various portable equipment, 89 in-use off-road diesel vehicles, 14 on-road heavy-duty diesel vehicles, and 131 LSI engine vehicles with CARB at the Livermore Site and Site 300.

In 2020, 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 limit actual emissions of regulated air pollutants from sources rather than potential emissions from sources. As such, LLNL has been able to demonstrate through extensive

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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 is not a “major facility” of air pollutant emissions per 40 CFR Part 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) less than 10 tons per year for VOCs. As a Minor Facility, Site 300 is no longer mandated to tally its rolling 12-month emissions, as previously required by SJVAPCD. In addition, Site 300 is no longer subject to annual compliance inspections, but falls under a biennial schedule.

Under the authority of AB 32, the State of California adopted several regulations to reduce greenhouse gas emissions. 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.

The CARB regulation to reduce greenhouse gas emissions from semiconductor operations applies to semiconductor (or related devices) operations that use fluorinated gases or fluorinated heat transfer fluids (HTFs). The regulation aims to reduce fluorinated compound air emissions which are very potent greenhouse gases. Facilities with semiconductor operations using fluorinated gases or HTFs are required to report fluorinated gas emissions beginning with calendar year 2010 and each calendar year thereafter. In 2020 LLNL’s annual emissions of fluorinated gases from semiconductor operations were below the 800 metric ton carbon dioxide equivalent (MT CO₂e) threshold. Facilities that exceed the 800 MT CO₂e threshold are required to meet strict emission standards for semiconductor operations.

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, SF₆ purchases, and the measures taken to control the SF₆ emissions from such research activities. LLNL was also required to keep records on the amounts of SF₆ contained in and emitted from electrical switchgear during calendar year 2020, with annual emission rate limit of 1% of its system capacity. LLNL’s 2020 emission rate of 3.6% exceeded the 1% annual emission rate limit.

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 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.

The EPA has a Mandatory Reporting of Greenhouse Gases 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 2020 Annual Report* (Wilson et al. 2021) reported that the estimated maximum radiological dose from radioactive air emissions were $1.9 \times 10^{-2} \mu\text{Sv}$ (1.9×10^{-3} mrem) for the Livermore Site and $1.8 \times 10^{-7} \mu\text{Sv}$ (1.8×10^{-8} 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 2020 Annual Report* is in Appendix C of this report.

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 (LPPFD) and the 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

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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 Part 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 online at <https://enviroinfo.llnl.gov/nepa>. DOE/NNSA is currently preparing a new SWEIS to analyze the impacts of continued operations at LLNL for the foreseeable future.

In 2020, no EISs or EAs were completed. Several Categorical Exclusions under DOE NEPA Regulations (10 CFR Part 1021) were completed as follows:

- *Diffraction experiments using insensitive high explosives (IHE) at the National Ignition Facility (NIF) (NA-20-1)*
- *Livermore Valley Open Campus (LVOC) Advanced Biotechnology Research and Response Laboratory (NA-20-2)*

As mandated under DOE regulations in 10 CFR Part 1021, a floodplain and wetlands assessments were prepared as required information for the upcoming SWEIS.

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.

LLNL and DOE/NNSA have completed the necessary inventory, evaluations, and consultations to identify National Register of Historic Places (NRHP) eligible buildings and archaeological sites at the both the Livermore Site and Site 300. In 2005, in consultation with DOE/NNSA, the California State Historic Preservation Officer (SHPO) formally determined that 5 archaeological resources, 5 individual buildings, 2 historic districts (encompassing 13 non-contiguous individual buildings), and selected objects in another building at LLNL are eligible for listing in the NRHP. As of 2020, based on DOE consultations with the SHPO and the Advisory Council on Historic Preservation (ACHP), all previously eligible facilities have been removed from the eligibility list. As final mitigation for loss of integrity for the period of historic significance, LLNL and DOE/NNSA prepared an Historic American Engineering Report (HAER) documentation for

these facilities.

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 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 2020.

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

On August 29, 2018, the U.S. Fish and Wildlife Service issued a sitewide biological opinion to DOE/NNSA for continued operations and maintenance of the LLNL Experimental Test Site, Site 300. Three projects, the Eastern General Services Area Well Decommissioning Project, construction of the Small Firearms Training Facility (Building 899), and the Building 855 Fence Line Project, were completed under this biological opinion in 2020.

At the Livermore Site, the Building 453 Exascale Computing Facility Modernization (ECFM), Building 031 Emergency Operations Center (EOC), Building 223 Polymers & Engineering Facility, Building 224 Office Building, Building 225 New AME Joining Capabilities & Vapor Deposition Facility, Building 642 Office Building, and Building 654 LCW Installation projects were conducted under the 2013 biological opinion for infill construction and redevelopment. Annual flood control maintenance within the Livermore Site reach of Arroyo Las Positas was completed under the 1997 biological opinion, and subsequent amendments, for the arroyo maintenance project on Arroyo Las Positas.

All Terms and Conditions and Conservation Measures required by the biological opinions described above were successfully implemented in 2020.

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 2020 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 2020.

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

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Table 2-2. Active permits in 2020 at the Livermore Site and Site 300.

Type of Permit	
Livermore Site	Site 300
Hazardous Waste	
<p>EPA ID No. CA2890012584. Hazardous Waste Facility Permit Number 99-NC-006 and RCRA Part A/B permit application—to operate hazardous waste management facilities. Agency–DTSC.</p> <p>Registered Hazardous Waste Hauler authorized to transport regulated wastes on public roadway. Permit number 1351. Agency– DTSC.</p> <p>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, and CA Accidental Release Program. Agency – LPFD CUPA.</p>	<p>EPA ID No. CA2890090002. Hazardous Waste Facility Permit and RCRA Part A/B permit application to operate CSA (Building 883), EWTF and EWSF. Agency–DTSC.</p> <p>EPA ID No. CA2890090002. Hazardous Waste Facility Post-Closure Permit and RCRA Site 300 Building 829 Post-Closure Operation Plan. 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 Large Quantity Medical Waste Generator 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.</p>	<p>Registered with SJCEHD as a Small Quantity Medical Waste Generator.</p>
Air	
<p>BAAQMD renewed the Permit-to-Operate (PTO) issued to LLNL Livermore Site (Plant No. 255) which covers 165 existing various air emission sources (111 permitted sources, 36 registered sources, and 18 exempt sources).</p> <p>BAAQMD issued one new PTO for a standby diesel engine powering an emergency generator at the LLNL Livermore Site.</p> <p>BAAQMD conducted compliance inspections on 90 air emission sources and one asbestos compliance inspection.</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 one Asbestos Renovation Permit.</p>	<p>SJVAPCD renewed the PTO issued to LLNL Site 300 (Facility ID N-472) which covers 35 existing various air emission sources.</p> <p>BAAQMD renewed the PTO issued to LLNL Site 300 (Plant No. 15611) which covers one existing standby diesel engine powering an emergency generator.</p> <p>SJVAPCD approved a Prescribed Burn Plan for the burning of 2,104.4 acres of grassland at LLNL Site 300.</p> <p>SJVAPCD conducted one compliance inspection on two air emission sources.</p> <p>SJVAPCD issued one Asbestos Renovation Permit.</p> <p>SJVAPCD issued one new PTO for a chemistry drying oven and one Authority to Construct (ATC) permit for a standby diesel engine powering an emergency generator at LLNL Site 300.</p> <p>BAAQMD approved a Prescribed Burn Plan for the burning of 139.1 acres of grassland at LLNL Site 300.</p> <p>CARB renewed four PERP registrations for portable diesel engines powering various portable equipment.</p>
Underground Storage Tanks	
<p>One operating permit (1016-09202018) issued by LPFD covering operation of 9 USTs from September 20, 2018–September 19, 2023.</p>	<p>One operating permit covering 3 underground petroleum storage tanks assigned individual permit numbers (PT0006785 [879TFUD01], PT0006530 [882TFUD01], and PT0007967 [879TFUG01]).</p>

Table 2-2. (cont.) Active permits in 2020 at the Livermore Site and Site 300.

Type of Permit	
Livermore Site	Site 300
Sanitary Sewer	
Discharge Permit 1250 ^(b) for discharges of wastewater to the sanitary sewer. Permit 1510G for discharges to the sanitary sewer of groundwater from CERCLA restoration activities.	WDR R5-2008-0148 for operation of sewage evaporation pond.
Water	
WDR No. 88-075 for discharges of treated groundwater from Treatment Facility A to recharge basin. ^(c) NPDES General Permit 2014-0057-DWQ (Waste Discharge Identification Number [WDID] 2 011025682) for discharge of storm water associated with industrial activities. NPDES General Permit 2009-0009-DWQ for discharges of storm water associated with construction activities affecting 0.4 hectares (1 acre) or more. FFA for groundwater investigation/remediation.	WDR No. 93-100 for post-closure monitoring requirements for two Class I landfills. ^(d) WDR R5-2008-0148 for operation of sewage evaporation pond and percolation ponds, and groundwater discharges from septic systems, cooling tower blowdown, mechanical equipment wastewater, and other low-threat discharges. NPDES General Permit 2014-0057-DWQ (WDID 5S39I021179) for discharge of storm water associated with industrial activities. NPDES General Permit 2009-0009-DWQ for discharges of storm water associated with construction activities affecting 0.4 hectares (1 acre) or more. Regional Limited Threat General Order R5-2016-0076-025 and NPDES Permit No. CAG995002 for discharges from the drinking water system. Domestic Water Supply Permit Amendment No. 01-10-16PA-003. FFA for groundwater investigation/remediation. Approximately 32 registered Class V injection wells.

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 2020.

^(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.

^(d) On July 22, 2020, the transfer of Site 300 Closed Landfill Pit 1 from Resource Conservation and Recovery Act (RCRA) Post-Closure Monitoring to Comprehensive Environmental Compensation and Liability Act (CERCLA) was completed. WDR No. 93-100 was rescinded and Pit 1 post-closure compliance monitoring will be conducted under CERCLA oversight.

2. Compliance

Table 2-3. Inspections of Livermore Site and Site 300 by external agencies in 2020.

Medium			
Description	Agency	Date	Finding
Air			
Air pollutant emission sources (Livermore Site)	BAAQMD	01/29/20	No violations
		01/30/20	No violations
		02/27/20	No violations
		07/30/20	No violations
		08/27/20	No violations
		11/03/20	No violations
Synthetic Minor Operating Permit (SMOP) (Livermore Site)	BAAQMD	12/21/20	No violations
Air pollutant emission sources (Site 300)	SJVAPCD	02/05/20	No violations
Hazardous Materials Business Plan			
CUPA Inspection (Livermore Site)	LPFD	N/A	No inspection during 2020 due to COVID-19 pandemic.
CUPA Inspection (Site 300)	SJCEHD	N/A	No inspection during 2020 due to COVID-19 pandemic.
Sanitary sewer			
Annual Inspection of the Sewer Monitoring Complex (Livermore Site)	WRD	11/03/20	No violations
Categorical sampling and inspection, Building 153 (Livermore Site)	WRD	05/20/20	No violations
		11/04/20	No violations
Annual compliance sampling at the Sewer Monitoring Complex (Livermore Site)	WRD	11/04/20	No violations
Café grease interceptor inspections, Buildings 125 and 471 (Livermore Site)	WRD	N/A	Cafeterias closed as of March 2020 due to COVID-19 shut-down. Inspections not required by WRD under closure conditions.
Quarterly BOD/TSS sampling at Outfall (Livermore Site)	WRD	02/20/20	No violations
		N/A	No 2 nd quarter inspection due to COVID-19 pandemic.
		N/A	No inspections 3 rd & 4 th quarters due to change in Wastewater Discharge Permit 1250 requirements.

Table 2-3. (cont.) Inspections of Livermore Site and Site 300 by external agencies in 2020.

Storage tanks			
Annual Spill Bucket/Monitoring Equipment Inspection (Site 300)	SJCEHD	7/29/20	SJCEHD issued two violations as a result of an Underground Storage Tank (UST) inspection: 1. "Designated Underground Storage Tank Operator Identification Form" not submitted within 30 days. 2. Failure to conduct the designated UST operator visual inspection at least once every 30 days. The second violation was rescinded.
Annual Spill Bucket/Monitoring Equipment Inspection (Five emergency generators at the Livermore Site)	LPFD	07/15/20–07/16/20	No violations
Annual Spill Bucket/Monitoring Equipment Inspection (B611 at the Livermore Site)	LPFD	08/12/20–8/13/20	No violations
491TFAD01	LPFD	03/05/20	No violations
U295TFBD01		08/19/20	No violations
U295TFAD02			
Tank Closures (Livermore Site)			
Waste			
CUPA Inspection (Livermore Site)	LPFD	NA	No inspections in 2020 due to COVID-19 pandemic.
CUPA Inspection (Site 300)	SJCEHD	10/13/20	No violations
Hazardous waste facilities Compliance Evaluation Inspection (CEI) (Livermore Site)	DTSC	NA	No inspections in 2020 due to COVID-19 pandemic
Hazardous waste facilities Compliance Evaluation Inspection (CEI) (Site 300)	DTSC	02/19/20-02/20/20 11/17/20	DTSC issued one violation for stacking totes in EWSF M2. No violations
Medical Waste facilities inspection	ACDEH	NA	No inspection in 2020 due to COVID-19 pandemic
Water			
Permitted operations (Site 300 Drinking Water)	SWRCB	N/A	No inspection during 2020.
Waste Discharge Requirements for sewage pond, percolation pits, and septic systems	CVRWQCB	11/23/20	No violations

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

2. Compliance

Table 2-4. Environmental Occurrences reported under the Occurrence Reporting System in 2020.

Date ^(a)	Occurrence category/group	Description
03/05/20	Report Level I Occurrence under Group 9(1) OR 2020-0009	On February 20, 2020, LLNL received a Summary of Violation following a CEI inspection of S300. The inspection report identified one violation for failing to comply with a Special Condition within the Final Hazardous Waste Facility Permit that states; "the permittee shall not stack containers holding explosives waste on top of another container."
08/03/20	Report Level I Occurrence under Group 9(1) OR 2020-0022	On July 29, 2020, LLNL received a Notice of Violation from SJCEHD as a result of an Underground Storage Tank (UST) inspection that identified the following two violations: 1. "Designated Underground Storage Tank Operator Identification Form" not submitted within 30 days. 2. Failure to conduct the designated UST operator visual inspection at least once every 30 days. This violation has been rescinded.

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

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

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