

Notice of Exemption

To: Office of Planning and Research
PO Box 3044, Room 113
Sacramento, CA 95812-3044

From: UC Lawrence Berkeley National Laboratory
Campus Planning Department
One Cyclotron Road, M/S 76-225
Berkeley, CA 94720

Project Title:	NERSC Facility Upgrade 2 and NERSC-10 Installation & Operation
Location:	UC Lawrence Berkeley National Laboratory
City:	Berkeley
County:	Alameda

Description of Nature, Purpose, and Beneficiaries of Project (Project Description):

The University of California, Lawrence Berkeley National Laboratory (UC LBNL) proposes to upgrade Building 59 electrical and cooling systems at the Lawrence Berkeley National Laboratory and install and operate a new high-performance computing system identified as National Energy Research Scientific Computing Center-10 (NERSC-10). The purpose of the facility upgrade is to accommodate NERSC-10 and potential future generations of high-performance computing systems while reducing reliance upon potable water for facility cooling. New generations of high-performance computing systems like NERSC-10 are necessary to further advance NERSC's mission of accelerating scientific discovery. Together, the NERSC facility upgrade and the NERSC-10 installation and operation components would comprise "the Project." The proposed Project would result in negligible or no change in use and have substantially the same purpose and capacity as existing Building 59 operations.

Public Agency Approving Project:	UC Lawrence Berkeley National Laboratory
Agency Carrying Out Project:	UC Lawrence Berkeley National Laboratory

Exempt Status:	Categorical Exemption
	§15301, Class 1: Existing Facilities
	§15302, Class 2: Replacement or Reconstruction
	§15303, Class 3: New Construction or Conversion of Small Structures

Reasons why the project is exempt:

Consistent with CEQA Guidelines **§15301**, the Project would involve minor alteration and operation of existing structures and mechanical equipment involving negligible or no expansion of use, including to building size and daily occupancy. Consistent with **§15302**, the Project would involve some replacement of existing building electrical and cooling infrastructure. Consistent with **§15303**, the Project would include installation of appurtenant structures: a concrete pad for electrical equipment and a metal platform for cooling equipment adjacent to the building exterior. None of the exceptions listed under CEQA Guidelines §15300.2 would apply.



Signature

Sept. 15, 2023

Date

Sr. Site & Environmental Planner, UC LBNL

Title/Lead Agency

Project Description

The University of California, Lawrence Berkeley National Laboratory (UC LBNL) proposes to upgrade Building 59 (also known as Wang Hall, the Computational Research and Theory Building, or CRT) electrical and cooling systems at the Lawrence Berkeley National Laboratory (LBNL, or Berkeley Lab) and install and operate a new high-performance computing (HPC) system identified as NERSC-10. The purpose of the building upgrade (NERSC Facility Upgrade 2 or NFU2) is to accommodate NERSC-10 and potential future generations of high-performance computing system(s) while reducing reliance upon potable water for facility cooling. New generations of high-performance computing systems like NERSC-10 are necessary to meet the continually evolving needs of the NERSC user community and to further advance NERSC’s mission of accelerating scientific discovery. Together, the NERSC Facility Upgrade 2 and the NERSC-10 Installation and Operation project components would comprise “the Project.” As provided in the Table and discussion below, the proposed Project would result in negligible or no change in use and have substantially the same purpose and capacity as the existing use.

	Current			Project		
Bldg 59	Approved Use ⁱ	Current Use	Current Capacity ⁱⁱ	Total Proposed Capacity ⁱⁱ	Projected Average Use at Project Completion	Projected Peak Use at Project Completion ⁱⁱⁱ
Electrical Power	22.1 MW	9 MW	25 MW	35 MW	23 MW	29 MW
Substation Capacity	27.5 MW	<9 MW	25 MW	35.0 MW	23 MW	29 MW
Water Usage ^{iv}	55 MGY	20 MGY	N/A	N/A	8 MGY	<10 MGY

Megawatts (MW); million gallons per year (MGY); not applicable (N/A)

- i** NERSC-9 Final Environmental Impact Report, SCH# 2016062007 (Feb 2017)
- ii** NERSC is outfitted with greater power capacity than is needed for anticipated peak use to allow for system resiliency and redundancy, particularly for maintaining operation in case of unexpected outage or equipment failure, and to account for “stranded” power inefficiencies.
- iii** Projected peak use would be the maximum approved electrical power use of Building 59 under this Project.
- iv** Water use projections are the expected Building 59 water consumption under full Project buildout and operation.

The NERSC Facility Upgrade 2 would modernize and upgrade the building’s electrical and cooling systems, as shown in the table above. The upgrade would be necessary to simultaneously operate the proposed new NERSC-10 and existing NERSC-9 high-performance computing systems¹ while optimizing use of electricity and substantially reducing water consumption. Installing and operating NERSC-10 would support LBNL’s National Energy Research Scientific Computing Center (NERSC) program, which is the DOE Office of Science’s production computing facility.

The proposed NERSC-10 HPC system—which would occupy the vacated NERSC-8 system location—is expected to use up to ~20 megawatts of power at peak performance, while the entire building with up to two HPC systems could use up to 29 MW at peak simultaneous demand. The electrical work scope includes installation of a new medium-voltage sectionalizing switch to accommodate additional power. This would be located on a new ~2,000-square-foot concrete pad (Switch Pad) southeast and adjacent to Building 59. Interior electrical improvements would include two secondary unit substations. Both units would be dedicated to increased HPC electrical capacity. Feeder lines would connect the substations to existing wall panels and new equipment.

¹ Building 59 was constructed to accommodate simultaneous operation of at least two HPC systems (CRT Final EIR, SCH# 2007072106 [April 2008]). This allows the current generation HPC system to continue to operate while the next generation is installed and seamlessly phased into operation. NERSC-8 was fully operating during the NERSC-9 HPC system installation. NERSC-9 has been operational as of November 2022.

To address HPC cooling needs, an array of six air-cooled heat-exchanger (ACHE) units is proposed to be located on a new, unenclosed, <12,000-square-foot steel platform (ACHE platform) north and adjacent to Building 59. Acoustic and visual screening walls would be placed around the ACHE platform to minimize noise and visual effects. This new system would serve as a “precooler” for HPC exhaust water, which would substantially reduce evaporative cooling water consumption despite a planned increase in HPC cooling needs. Under the Project, current Building 59 water consumption of ~20 million gallons per year (MGY) would be expected to drop to an average of around 8 MGY.

Project improvements would support a variety of future NERSC operational configurations. NERSC currently operates two HPC systems in tandem, as it has historically. Under the proposed Project, the NERSC-9 and NERSC-10 systems would operate simultaneously for as long as needed by the program. At such time NERSC-9 were retired, NERSC-10 could operate by itself, or in tandem with a future NERSC-9 replacement system, or in combination with a number of smaller “plug-and-play” systems.

To handle the modest stormwater runoff from a small increase in impervious surfaces on the project site, the proposed Project would install two subsurface stormwater hydromodification tanks with a total capacity of ~16,000 gallons. These tanks would detain stormwater during large storm events and control its release to maintain the downstream health of Strawberry Creek and its tributaries. This would also help ensure project compliance with Federal Energy Independence and Security Act (EISA) section 438 requirements as well as NPDES requirements, including C3 requirements related to hydromodification.

Construction would commence in late 2024 with work continuing through 2026. The NERSC-10 system may be delivered in two phases. Phase one is anticipated for a late 2025 delivery, followed by Phase 2 in late 2026. An average of 35 onsite workers with a peak crew of 50 is expected over the duration of project construction. Work would primarily occur during business hours from Mondays to Fridays; however, a few planned utility outages could result in instances of weekend work. Up to three delivery truck trips are expected on a daily basis, the majority of which would be accomplished using light-duty trucks. Occasional heavier construction trucks would include soil-hauling and concrete trucks for excavating and constructing the exterior concrete switch pad and ACHE platform. Once equipment is placed, it would be integrated using hand-held tools and small-scale lifts.

The proposed Project site falls within and would be consistent with the Lab’s “Research and Academic” land use designation as identified in the LBNL 2006 Long-Range Development Plan. This land use zone describes areas that are largely developed and that provide space and support to LBNL research and administrative functions. The proposed Project is further consistent with the objectives laid out in the Computational Research and Theory Facility EIR (SCH# 2007072106, April 2008), including by: providing “an integrated and appropriately designed facility that would allow for the continued operation and future advancement” of NERSC as a user facility; providing “adequate... chilling capacity and infrastructure to allow for continual future upgrades” of next-generation computing equipment; providing access “to large, reliable, and economical electrical power source...capable of serving both the immediate and potential future needs of Berkeley Lab’s computing programs.”